Bronchiolitis Compendium

2001-2015

ছোট্ট শিশুর

হাসি, কান্না ও বাঁশি

Bangladesh Pediatric Pulmonology Forum (BPPF)

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Printing
Asian Colour Printing
130 DIT Extension Road
Fakirerpool, Dhaka-1000
Phone: 9357726, 58313187
E-mail: asianclr@gmail.com

(13 March 1944 - 09 March 2015)

“Pneumonia is overdiagnosed and mixed up with Bronchiolitis resulting in rampant misuse of antibiotics”

- Prof. MS Akbar, FRCP
FORMER
Director, Dhaka Shishu Hospital
and
Academic Director, Bangladesh Institute of Child Health (BICH), Dhaka
Member of Parliament & Chairman, Bangladesh Red Crescent Society

PREFACE

We were oblivious of bronchiolitis till the year 2000. We first had the experience of epidemic of bronchiolitis in the year 2001 and submitted a leading article in the Bangladesh Journal of Child Health. But the then Editor of the journal was skeptical about the fact and the title of the article had to be changed with a question mark for its acceptance and subsequent publication in the journal. Later on, we had lot of experience of bronchiolitis all over the country. We came to know that the leading cause of bronchiolitis is respiratory syncitial virus (RSV) and also other viruses like influenza, parainfluenza, adenovirus, human metapneumo virus etc. In the year 2005, a national guideline was developed for bronchiolitis under the auspices of DGHS and Asthma Association of Bangladesh.

Bronchiolitis is the single most infective disease upon which so far the maximum number of continous research activities were conducted since recognizing its existence. The post graduate students particularly targeted this disease for various FCPS dissertations and MD thesis because of the high prevalence, easy to diagnose and management variability.

So far, about 60 studies (publication 22, FCPS Dissertation 22, MD thesis 07, others 06) have been conducted on bronchiolitis since the year 2001 till 2015. The abstracts and full texts of some important studies have been presented in this compendium. We have complied the studies so far we could have searched out (Pubmed, Medline, Bangladesh Journal Online, Google search, BCPS library, BSMMU library, and personnel communication) and there may be some unintentional left out studies in the field of bronchiolitis. The researches included are field and hospital based studies, FCPS dissertation, MD Thesis, reviews, conference presentations and book references.

Two important studies must be quoted considering the importance from prevalence point of view and management issue. The first one article No. 57, page 100 (*Journal of respiratory medicine research and treatment* - in press) was conducted all over the country including all levels of hospitals (43) starting from upzilla and up to medical college hospital and specialized children hospital with a sample size of 5157 of under 5 children. We came to know that the prevalence of bronchiolitis is more than pneumonia so far the acute lower respiratory tract is concerned. Another study was the first ever conducted multicentre randomized control trial having the largest sample size (295) on the management of bronchiolitis without antibiotics (*Acta pediatrica 2009 article no. 24, page 46*). This study has been placed in Cochrane data base out of seven among 728 studies over a period of 48 years (1966-2014). Another good news is that this study has been quoted in the world famous 'Pediatric Respiratory Bible Book' *Kendig and Chernick's Disorders of the Respiratory Tract in Children*, Eighth Edition, 2014 (page 94).

Considering the above facts and evidences, the implication is enormous. It is imperative on the part of pediatricians or general physicians to diagnose bronchiolitis correctly and differing it from pneumonia and manage it without antibiotics and counsel the parents properly about the recurrence of the disease in young period of life with the possibility of asthma in future.

Prof ARM Luthful Kabir
Prof Md Abid Hossain Mollah
Prof Md Ruhul Amin

14 October, 2015

CONTENTS

Sl No.	Title, Principal author / Co-author / Investigator / Guide	Journal, FCPS Dissertation, MD Thesis Conference & Others	Duration	Page
12.	Effects of corticosteroid in acute bronchiolitis Abul Kalam Azad Guide: Badrul Alam	MD Thesis	2007	**28**
13.	Efficacy of oral prednisolone in pelieving hypoxia in children with acute bronchiolitis who have a history of atopy: A randomized control trial (RCT) Akhlaq Ahmed Guide: Md. Ekhlasur Rahman	MD Thesis	2007	**29**
14.	Efficacy of nebulized ipratropium bromide versus salbutamol in infants with acute bronchiolitis Absar SM, Jahan S, Khanam S	Bang Med Res Coun Bull	2008	**30**
15.	Risk factors of bronchiolitis in young children (02-24 months) Farhana Mumtaz Papree Guide:	FCPS Dissertation	2008	**31**
16.	Septic evaluation of bronchiolitis in infants with or without fever Mamun Reza Khan Guide: ARM Luthful Kabir	FCPS Dissertation	2008	**32**
17.	Radiological features of bronchiolitis- a study of 198 cases Afsana Mukti Guide: ARM Luthful Kabir	FCPS Dissertation	2008	**34**
18.	Prediction of length of hospital stay and immediate outcome of children suffering from bronchiolitis on the basis of associated risk factors, initial blood count and radiological findings Bithi Debnath Guide: Md. Azizul Haque	FCPS Dissertation	2008	**36**
19.	Role of antibiotic in the outcome of bronchiolitis Chowdhury Habibur Rasul, ARM Luthful Kabir, AKMM Rashid et al.	Pak J Med Science	2008	**37**
20.	Comparative efficacy of nebulized L-adrenaline versus salbutamol in infants with acute bronchiolitis AKM Amirul Morshed, M Ruhul Amin	Bangladesh J Child Health	2008	**38**
21.	ARI situation in Bangladesh: are n't we oblivious of bronchiolitis? ARM Luthful Kabir, AKM Fazlur Rahman, Aminur Rahman	Mymensingh Med J	2009	**39**

Sl No.	Title, Principal author / Co-author / Investigator / Guide	Journal, FCPS Dissertation, MD Thesis Conference & Others	Duration	Page
22.	Management of bronchiolitis with or without antibiotics- a randomized control trial Mazumder MJU, Hossain MM, Kabir ARML	J Bangadesh Coll Phys Surg	2009	**40**
23.	Management of bronchiolitis in hospitalized children Shahin Akter Guide: ARM Luthful Kabir	FCPS Dissertation	2009	**42**
24.	Management of bronchiolitis without antibiotics: a multicentre RCT in Bangladesh ARM Luthful Kabir, Abid Hossain Mollah, Kazi Selim Anwar et al.	Acta Pediatrica	2009	**46**
25.	Efficacy of nebulized ipratropium bromide versus salbutamol in infants with acute bronchiolitis Md. Balayat Hossain Dhali Guide: Moinuddin Ahmed	MD Thesis	2009	**57**
26.	Comparative efficacy of combined nebulized salbutamol with ipratropium bromide and nebulized adrenaline to treat children with acute bronchiolitis Kadir MA, Mollah AH, Basak R et al	Mymensingh Med J	2009	**58**
27.	Prevalence of viral bronchiolitis in WHO classified severe pneumonia ARM Luthful Kabir, Ryuichi Uchida, Selim Ahmed	BPA Conference, Khulna	2010	**59**
28.	Efficacy of hypertonic (3% NaCl) saline solution nebulization in children with acute bronchiolitis Mohammad Abul Khayer Guide: Manajjir Ali	FCPS Dissertation	2010	**60**
29.	Clinical profile and radiological evaluation of bronchiolitis in hospitalized children Faizul Haque Ponir Guide:	FCPS Dissertation	2011	**61**
30.	Comparative efficacy of nebulized salbutamol alone versus combined nebulized salbutamol and ipratropium bromide in the treatment of acute bronchiolitis Md. Abdullah Guide: Azizul Haque	FCPS Dissertation	2011	**62**
31.	Outcome of bronchiolitis case management without Aantibiotic - A randomized control trail in a tertiary hospital Sheikh Mujibur Rahman Guide: Jhulan Das Sharma	MD Thesis	2011	**63**

Sl No.	Title, Principal author / Co-author / Investigator / Guide	Journal, FCPS Dissertation, MD Thesis Conference & Others	Duration	Page
32.	Bronchiolitis: An update (review) Md. Jashim Uddin Mazumder, ARM Luthful Kabir, Wahida Khanam et al.	ICMH Journal	2011	**64**
33.	Clinical profile and hospital outcome of neonatal bronchiolitis: A study of 50 cases May May Hla Marma Guide: Md. Abid Hossain Mollah	FCPS Dissertation	2012	**65**
34.	Bronchiolitis: An out-break in bangladesh and its optimun management ARM Luthful Kabir, Md. Abid Hossain Mollah	BPA CME ShSMC, Dhaka	2012	**67**
35.	Magnitude of lower respiratory tract infection (bronchiolitis and pneumonia) among the under five children attending an upazilla hospital of Bangladesh Bidhan Chandra Podder Guide: ARM Luthful Kabir	FCPS Dissertation	2012	**69**
36.	Study of nutritional status of children (02-24 months) with acute bronchiolitis and pneumonia Nazmun Nahar Shampa Guide: Md. Abid Hossain Mollah	FCPS Dissertation	2012	**71**
37.	How and why we miss acute bronchiolitis? ARM Luthful Kabir, Md. Ruhul Amin, Md. Abid Hossain Mollah	43rd World Congress on Lung Health Kualalampur	2012	**73**
38.	Bronchiolitis outbreak caused by respiratory syncytial virus in southwest Bangladesh Haque F, Husain MM, Ameen KM	Int Journal Infact Disease	2012	**75**
39.	Efficacy of oral prednisolone in relieving hypoxia in children with acute bronchiolitis who have a history of atopy Md. Azizul Hossain, Helalul Haq, Kazi Abdul Mannan	MD Thesis	2012	**76**
40.	Disease Profile and Death Pattern Among Children Admitted in a Medical College Hospital M Shameem Hasan, Sanat Kumar Barua, M Nasiruddin Mahmud et al.	Bangladesh J Child Health	2012	**77**
41.	Clinico-etiological study of bronchiolitis in a tertiary care hospital Mohammad Shohel Guide: Md. Abid Hossain Mollah	FCPS Dissertation	2013	**78**

Sl No.	Title, Principal author / Co-author / Investigator / Guide	Journal, FCPS Dissertation, MD Thesis Conference & Others	Duration	Page
42.	Anaemia is a risk factor of bronchiolitis Farhan Karim Guide: ARM Luthful Kabir	MD Thesis	2013	**80**
43.	Challenges to evaluating respiratory syncytial virus mortality in Bangladesh, 2004-2008. Stockman LJ, Brooks WA, Streatfield PK,	PLOS ONE	2013	**81**
44.	Bronchiolitis and Bangladesh ARM Luthful Kabir, Md Ruhul Amin, Md. Abid Hossain Mollah	Joint Conference CPSP & BCPS, Lahore	2013	**82**
45.	Magnitude of the respiratory disorders in under five children attending the upazila hospitals of Bangladesh Mohammad Rezaul Haque, ARM Luthful Kabir, Sonia Jesmin et al.	ICMH Journal	2013	**83**
46.	Role of Antibiotic in Bronchiolitis Management Akhtar K, Chowdhury RB, Rahman MT	JAFMC Bangladesh	2013	**84**
47.	Efficacy of nebulized hypertonic saline versus normal saline & salbutamol in treating acute bronchiolitis in a tertiary hospital- a randomized control trial Rumi Myedull Hossain Guide: Md. Abid Hossain Mollah	FCPS Dissertation	2014	**85**
48.	Comparison efficacy of nebulized 3% hypertonic versus 0.9% normal saline in children with bronchiolitis Khandaker Tareq Guide: Md. Abid Hossain Mollah	FCPS Dissertation	2014	**86**
49.	Antibiotics for bronchiolitis in children (Review) Rebecca Farley, Geoffrey KP Spurling, Lars Eriksson et al.	The Chochrane Collaboration	2014	**87**
50.	Cardiovascular changes in children with acute lower respiratory infection Shahreen Kabir Guide: Luthful Ehsan Fatmi	FCPS Dissertation	2014	**91**
51.	Efficacy of prednisolone for children with acute bronchiolitis having family history of atopy: A randomized placebo-controlled trial Md. Abid Hossain Mollah, Khondaker Zahirul Hasan, M Ekhlasur Rahman et al.	Northern Int Med. Coll Journal	2014	**92**

Leading Article: Bangladesh J Child Health 2002; 26(1/2): 1-2

BRONCHIOLITIS: ARE WE FACING AN EPIDEMIC?

ARM Luthful Kabir

Institute of Child and Mother Health (ICMH), Dhaka

There has been a recent outbreak of bronchiolitis in winter and spring in Bangladesh. In the months of January and February of this year 2001 different hospitals of Dhaka City reported about 348 children being admitted with bronchiolitis. The hospitals are Institute of Child and Mother Health (221 cases), Dhaka Medical College Hospital (54 cases), Dhaka Shishu Hospital (52 cases), Sir Salimullah Medical College and Mitford Hospital (21 cases). There were also reports of 2093 cases of 'severe pneumonia' or 'ARI' from different hospitals outside Dhaka. The hospitals include Mymensingh Medical College Hospital (107 cases), Nandail Upazilla Health Complex, Mymensingh (355 cases), Laksmipur Sadar Hospital (16 cases), Noakhali General Hospital (237 cases), Jhenaidaha Sadar Hospital (573 cases), Magura Sadar Hospital (522 cases), Chittagong Medical College Hospital (CMCH) (283 cases). Moreover, 85 cases were attended in the above hospitals (excluding CMCH) during visit and the cases were being diagnosed as either 'severe pneumonia' or 'ARI'. All the 85 cases presented with first attack of wheeze. The median age of the children was 3.0 months. There were 78% male and 22% female.

The children outside Dhaka were mostly treated with ceftriaxone (72.5%) and corticosteroids (70.5%). The overall mortality was 5%.

The study with 348 cases of Dhaka city showed that median age of affected children was 3.0 months with male 64% an female 36%. There had been typical clinical presentation like the development of low grade fever along with cough and coryzal symptoms followed by rapid development of wheeze, respiratory distress, feeding difficulty, fast breathing, chest indrawing, anterior bulging of the chest wall, crackles and hyperinflation on chest radiography. Children with bronchiolitis were found positive for RSV antibody (IgM and IgG) in almost 80% cases. The median duration if hospital stay was 4 days. The mortality was 1%.

Bronchiolitis an acute inflammatory respiratory illness of infants and young children occurring in the first 2 years of age. It is a viral disease. The most important causative agent is respiratory syncitial virus (RSV) and others are parainfluenzae, influenzae, adenovirus, and rhinovirus etc. During an epidemic RSV is mostly responsible for causing bronchiolitis. Bronchiolitis is a clinical diagnosis. Wheeze and hyperinflation on chest radiography in infancy is most likely due to bronchioitis. The associated features are running nose, low grade fever, toxic appearance, feeding difficulty, restlessness and chest indrawing. The management includes isolation of the case, oxygen therapy, hydration, nutrition, inhaled adrenaline. and systemic corticosteroid. Antibiotics have little therapeutic value in bronchiolitis as bacterial infections are rare in bronchiolitis.

Antibiotics may be given if the child is toxic, febrile, blood count shows leukocytosis and CRX is suggestive of lobar infiltrates. The implication of such an outbreak of bronchiolitis is that there is 70% chance of recurrent wheeze and 30% possibility of asthma in the child in future.

There are several concerns as to the management of bronchiolitis in our situation. The physicians are not recognizing bronchiolitis as a disease entity. Bronchiolitis is now being diagnosed as ARI or pneumonia.. The diagnosis of the young children's respiratory problem are being made on the basis of WHO criteria for the classification of ARI cases but the treatment given mostly with third generation antibiotics along with corticosteroids. The specific treatment of oxygen therapy is being ignored.

ARI control program has developed lot of awareness about pneumonia in our community. Our mothers are now very much conscious about the development of respiratory distress in their children. Mothers can tell themselves about 'pneumonia' in their children. It is expected that the health workers working in the field level would pick up cases and would classify the cases in accordance to the ARI guidelines. They would give home treatment, antibiotics or refer the cases to higher hospitals for proper management. Doctors are supposed to do the specific diagnosis and provide appropriate treatment. On the contrary, our doctors are keeping themselves confined to the diagnosis of 'pneumonia' in case of development of respiratory distress (chest indrawing) from any cause. The children with bronchiolitis, asthma, heart failure, croup, laryngomalacia, and real pneumonia are all being diagnosed as 'pneumonia'.

The problem of bronchiolitis should be recognized by our physicians The management of bronchiolitis must be optimized by providing adequate and effective humidified oxygen therapy, inhaled adrenaline, care of hydration and nutrition, rational use of antibiotics, counseling of parents about the self-limiting nature of the disease and the future possibility of reactive airway disease.

Bangladesh J Child Health 2002; 26(1/2): 3-8

BRONCHIOLITIS: AN UPDATE

ARM Luthful Kabir[1], M Ruhul Amin[2]

[1]Institute of Child and Mother Health (ICMH), [2]Bangladesh Institute of Child Health (BICH), Dhaka

Bronchiolitis: Introduction

Bronchiolitis is the most significant respiratory illness of infants and young children. It is an acute inflammatory respiratory illness of children that occurs in the first 2 years of age and is characterized by coryzal symptoms followed by rapid onset of fever, wheeze, tachypnea, chest recession and crepitation, with radiological evidence of hyperinflation.

Those that developed bronchiolitis reported a higher incidence of symptoms throughout the first two years of life. As with respiratory function and airway responsiveness, an association has been demonstrated between an episode of bronchiolitis and subsequent incidence of wheeze. Bronchiolitic symptom scenario appears to be cough and wheeze before, during and after infection.

Bronchiolitis: Epiemiology

The incidence of bronchiolitis has been shown to be as high as 11 cases per 100 children per year of both the first and second 6 months of life. In the first 6 months of life, 6 children per 1000 are hospitalized with bronchiolitis per year in USA. The care of hospitalized infants with bronchiolitis represents a major portion of health care efforts and costs, estimated to $300 million each year.

In the majority of infants with bronchiolitis, the illness is mild, but approximately 1% to 5% requires hospitalization, of these, respiratory failure develops in 3% to 7% and 1% die.

Seasonality of bronchiolitis caused by RSV virus is striking and predictable. The incidence peaks during winter and early spring and reaches near zero in late summer and autumn in both hemispheres. In tropical climates, occurrence of RSV bronchiolitis tends to coincide with rainy season. Bronchiolitis caused by other agents occur throughout the year.[5] The age for peak incidence of RSV bronchiolitis is between 2 and 6 months; approximately 80% of all cases occur during the first year of life. Two subtypes (A and B) of RSV exist –subtype A is more common cause of bronchiolitis and is associated with more severe disease. The age for peak incidence in urban areas may be earlier from 2 to 3 months of age. Bronchiolitis is seen in children as old as 2 years in more remote localities and in areas where risk of exposure is reduced.

Bronchiolitis : Risk factors

Prematurity is a risk factor for severe lower respiratory tract illness (bronchiolitis, pneumonia) that necessatiates hospitalisation. Bronchiolitis is not typically described in infants younger than 4 to 6 weeks of age although the same viral agents cause other manifestations like apnea, pneumonia and URTI in neonates. Bronchiolitis is slightly more common in boys, who are more likely to experience severe disease. Rates of hospitalization with RSV bronchiolitis is more in lower socioeconomic families. Breast

feeding seems to protect against RSV and other wheezing respiratory illnesses in the first four months of age. Infants who reside in crowded environment and have older siblings may be at risk of bronchiolitis.

Exposure to passive smoking , particularly maternal smoking, has been shown to be at risk factor for bronchiolitis in infancy. Data from China indicate that there may be a synergistic effect of passive smoking and formula feeding on the risk of respiratory illness. American Indian children living in homes with wood-burning stoves are at higher risk of clinical bronchiolitis and pneumonia. When RSV infection is epidemic, there is 45% risk of acquiring the infection if the children are inpatients for a week or more.

Bronchiolitis: Aetiology

Table-1

Infectious agents associated with acute bronchiolitis

Infectious agents	Relative frequency (%)
Respiratory syncytial virus	50
Parainfluenza viruses	25
Adenovirus	5
Mycoplasma pneumonae	5
Rhinoviruses	5
Influenza viruses	5
Enteroviruses	2
Herpes simplex virus	2
Mumps virus	<1

Bronchiolitis and associated infections

There is evidence that the course of bronchiolitis may be atypical or unusually severe if there is simultaneous infection with other pathogens. The other organisms are adenovirus, Pneumocystis carinii, cytomegalovirus, or Streptococcus pneumonae as found in 4.8% cases. Bacterial complications after RSV infections of the lower respiratory tract in hospitalized patients occur infrequently.

Bronchiolitis: Pathogenesis and pathophysiology

RSV is transmitted by direct inoculation of large droplets or by self-inoculation. Once the RSV infects the eyes or nose the incubation period is 2 to 8 days. The susceptibility of infants and young children to bronchiolitis is partly a result of their immunological immaturity and smaller airways. Recent data suggest that babies who are born with narrower peripheral airways may develop more severe episodes of bronchiolitis when exposed to RSV. The pathological findings associated with bronchiolitis include: epithelial cell necrosis and desquamation; edema of the bronchiolar walls; mucus plugging of airways and peribronchiolar infiltration with lymphocytes. These pathological changes cause hyperinflation of the lung, increased airway resistance, decreased compliance and an increased work of breathing. The non-uniform distribution of the pathological events cause ventilation-perfusion mismatching which results in hypoxaemia. Severe bronchiolitis may result in respiratory muscle fatigue, hypoventilation and carbondioxide retention.

Bronchiolitis : Clinical features

Table-II

Symptoms and signs in children with acute bronchiolitis (%)

Symptoms/ signs	114 cases[29]	221 cases [30]
Symptoms		
Fast breathing	***92***	***99.5***
Chest indrawing	90	99
Unable to feed	66	91
Fever	71	92
Vomiting with cough	34	23
Signs		
Wheeze (audible on auscultation)	100	100
Fast breathing (RR>50/min)	93	99
Chest indrawing	93	98
Crepitations	78	92
Raised temp (100°F or more)	30	36
Hyperresonance on percussion	40	—
Wheeze (audible without stethoscope)	25	—
Palpable liver	—	84
Palpable spleen	—	37
Grunting	18	—
Cyanosis	5	3
Toxic appearance	—	5
Hoarse voice	—	4
Convulsion	—	2

Bronchiolitis : Investigations

Measurement of oxygen saturation by pulse oximetry is widely used to see the oxygen saturation level in blood. Hemoglobin determination should be obtained in order to ensure adequate oxygen carrying capacity. TLC count usually normal in most of the cases.

CXR-ranges from normal to an extensive spectrum: hyperinflation of the lungs with patchy areas of atelectesis and increased AP diameter on lateral view showing fullness of the retrosternal space. Scattered areas of consolidation and atelectesis secondary to obstruction or by inflammation of alveoli (in 30% of cases) with attenuated hilar structures. It is sometimes difficult to exclude early bacterial pneumonia on radiographic grounds alone. Blood gas analysis is done to look into respiratory acidosis or hypercapnea. Nasopharyngeal aspirates (NPA) can be tested directly for RSV antigen within few hours by ELISA or immunofluorescence. Blood culture may be done to exclude associated bacterial pneumonia. Serum electrolytes, osmolality and urinary osmolality can also be done to the effect of inappropriate secretion of ADH.

Bronchiolitis : Diagnosis

Most authors agree that the following features are adequate for the diagnosis of bronchiolitis.

- wheezing
- hyperinflation of the lungs
- previously healthy
- child below two years (preferably one year) of age

Others diagnostic criteria to define bronchiolitis:

Coryzal symptoms followed by rapid onset of wheeze, tachypnea, chest indrawing, crepitations, hyperinflation on radiography, positive RSV in nasal aspirate (or time of RSV prevalence), and physician diagnosis

Bronchiolitis: Differential diagnosis

The common differential diagnosis of acute bronchiolitis are the following:

- viral pneumonia
- bacterial pneumonia
- pertussis
- congestive heart failure
- infantile asthma
- cystic fibrosis

Bronchiolitis: Management

When to hospitalize?

- toxic appearance
- unable to feed
- RR 60 to 70/ min
- cyanosis
- hypoxaemia- SpO_2 <94% as measured by pulse oximeter

Supportive management

The traditional approach to symptomatic management of bronchiolitis has been supportive care with attention to oxygen therapy, hydration and respiratory support as needed.

- isolation of the case as a contagious disease
- placed in a congenial and cool environment without too much wrapping
- positioning of the infant-head up, sitting at a 30 to 40 degree angle or with the head and chest slightly elevated so that the neck is somewhat extended
- hydration (dehydration because of cough-induced vomiting, poor intake or breathlessness)-by oral plus IV fluids
- feeding - even may be through NG tube
- monitoring of HR, RR, body temp, electrolytes, osmolality, pH and clinical signs of deterioration

Indications for intubation and mechanical ventilation

- tachycardia (>200 bpm)
- advancing respiratory insufficiency
- listlessness or lethargy
- poor peripheral perfusion

Specific management

- humidified oxygen administration in concentrations of 35 to 40% is adequate for most affected patients to maintain arterial saturation in the range of 94-96%.
- aerosolized antiviral (Ribavirin) are recommended in highly selected cases like bronchiolitis with heart disease, immunodeficiency, cystic fibrosis, BPD etc.
- antibiotics have little therapeutic value in bronchiolitis. Bacterial infections are rare in bronchiolitis. However, recent study had shown that bacterial AOM may be a complication in bronchiolitis and moreover, the clinical presentation, laboratory tests like TLC, CRP and chest radiographs may not sufficiently distinguish between viral and bacterial pneumonia or eliminate the possibility of duel infection. Antibiotic therapy as per WHO guideline for ARI may be initiated if the child is toxic, febrile and shows high TLC (>15,000/ccmm) and lobar infiltrate on radiography.

Controversial management

Physicians may feel pressure from parents and nurses to render some form of treatment for bronchiolitis. Despite ample published evidence demonstrating the limited efficacy of β_2-agonist therapy for patients with bronchiolitis, physicians are treating bronchiolitis patients as although they had asthma, or some other sort of reactive airway disease rather than a disease that is usually self-limiting, caused by a virus, and characterized primarily by edema rather than bronchospasm. Bronchodilators are among the more common treatments used. It should be mentioned that 86% of children in the Canadian study were treated with bronchodilators and nearly all members of the European Society for Pediatric Infectious Diseases use bronchodilators in children with bronchiolitis. But the nebulised drugs are expensive, of only modest clinical benefit in a subset of patients, and have not been shown to reduce morbidity or length of hospital stay.

Nebulized albuterol therapy also does not appear to enhance recovery or attenuate severity of illness in infants hospitalized with acute bronchiolitis as evidenced by improvement in oxygen saturation, time to meet standardized discharge criteria, or length of hospital stay.

The use of bronchodilators may even be harmful. It may be secondary to irritant or osmotic effect of the nebulising solution on the airways or bronchodilators may inhibit hypoxia induced pulmonary vasoconstriction resulting in increased intrapulmonary shunting and a decrease in oxygen saturation. Nabulisation procedure also disturbs the baby, particularly face masks are poorly tolerated by the infants. The child may be benefited with only high concentration of oxygen through an oxygen hood without nabulisation.

Recently, one study found inhaled recemic epinephrine, more efficacious than salbutamol.[50] The use of inhaled adrenaline in the treatment of moderate-to-severe bronchiolitis in hospitalized infants, as well as oxygen and fluid therapy as other measures are now recommended.

About the use of systemic corticosteroids in bronchiolitis, meta-analysis has suggested a statistically significant improvement in clinical symptoms, length of stay and duration of symptoms. However, there are no short or long term clinical benefits from the administration of nebulised corticosteroids in the acute phase of RSV bronchiolitis. There is no role of chest physiotherapy in acute bronchiolitis.

Bronchiolitis: Course and prognosis

The most critical phase of illness is first 48-72 hours of the onset of cough and dyspnoea. The usual natural course of bronchiolitis is remarkably constant. The duration of maximal respiratory distress is 1 to 2 days, followed by dramatic clinical improvement. During convalescence, some wheezing and prolongation of the expiratory phase during respiration may be observed for 7 to 10 days. Hospital stay for bronchiolitis (and viral pneumonia) is 3-7 days and clinical improvement is apparent by 3 or 4 days. Hypoxaemia of some degree persisted for 3 to 7 weeks. Intubation and ventilation is required in 3% to 7% of hospitalized patients. The case fatality rate is below 1%. Death usually happens from prolonged apnoic spells, uncompensated acidosis or severe dehydration.

Infants with CHD, immunodeficiency, bronchopulmonary dysplasia or cystic fibrosis, born with prematurity, with reactive airway disease may have greater mortality and morbidity. The risk may extend beyond infancy. Bacterial pneumonia and heart failure during bronchiolitis are rare.

Twenty percent of children with bronchiolitis experience a protracted course. Pulmonary function abnormalities and gas-exchange disturbances persists for weeks or months. Another 1% of infants develop chronic bronchitis resembling bronchiolitis obliterans. Immunity to RSV is imperfect. The disease recurs throughout life, although amelioration of symptoms with subsequent exposures is the general rules in otherwise healthy people.

Bronchiolitis: Asthma and chronic obstructive airway disease

Longer term sequelae are common after bronchiolitis, with upto 70% of infants experiencing recurrent cough and wheezing. Controversy exists as to whether an episode of bronchiolitis is the first manifestation of asthma. In one study, by the age of 2 years, those with a history of bronchiolitis had an increased incidence of asthma (44%) in comparison with the cohort (18%).

Sigurs at al suggested that RSV bronchiolitis was important, particularly in those with an inherited atopy. The pathophysiology of post-bronchiolitic wheezing remains unclear but chronic viral-induced airway inflammation, a genetic propensity for pulmonary hyperreactivity, congenitally small airways, or an atopic predisposition are possible factors. An episode of bronchiolitis in the first 2 years of life might cause subsequent lower respiratory morbidity or that bronchiolitis identifies those infants

predisposed to develop asthma. Children with H/O bronchiolitis showed abnormal pulmonary function, increased airway responsiveness, increased lower respiratory symptoms and impaired oxygenation The relationship of bronchiolitis in infancy and chronic obstructive pulmonary disease in later life remains an area of intense speculation.

Presented in Conference - ASCON 2002

BRONCHIOLITIS AND NUTRITIONAL STATUS

ARML Kabir[1], N Haq[1], R Amin[2], A Hossain[3], S Khatoon[4], S Akhter[1], T Sharif[1], S Ahmed[1], A Rahman[1], M Hossain[1], S Ahamed[3], and A Khashru[2]

[1]Institute of Child and Mother Health, Matuail, Dhaka 1362, Bangladesh, [2]Dhaka Shishu Hospital, Sher-e-Bangla Nagar, Dhaka 1207, [3]Dhaka Medical College Hospital, Dhaka 1000, [4]Sir Salimullah Medical College and Mitford Hospital, Mitford, Dhaka 1100

Objective: Evaluate the nutritional status and outcome of consecutively hospitalized young children with bronchiolitis.

Methodology: Three hundred and forty-eight children, aged less than 2 years, with bronchiolitis were studied in different hospitals of Dhaka city. Diagnosis of bronchiolitis was made on the basis of the first attack of wheeze in previously healthy children aged less than 2 years. Immediate medical history was collected from their mothers through a structured questionnaire. The weight of each child was measured and the weight-for-age z-score calculated to find out the nutritional status. Chest X-ray was done in each case to find out the radiological changes. Blood samples of 80 patients were studied for RSV IgM and IgG antibody by ELISA. The children were followed up till discharge.

Results: There were 66% male and 34% female children. The median age of the children was 3.0 months. Fifty-five percent of the cases came from rural areas and 45% from urban areas. Forty-seven (58.7%) children were positive for IgM antibody, and 14 (17.5%) were positive for IgG antibody giving rise to 76.2% RSV virus positivity. Most (72%) children had good nutritional status (WAZ -2.0 through the highest), and a minority had either moderate underweight (21%) (WAZ -2.01 to -3.0) or severe underweight (7.5%) (WAZ <-3.0 through the lowest). There was no difference in the mean respiration rate among three groups of children (66.8, 66.4, and 67.1 in well-nourished, moderate underweight, and severe underweight groups respectively). The hospital stay had the trend of increasing duration with the decrease of body weight (4.5, 5.3 and 6.0 days respectively, $p < 0.009$).

Conclusion: Bronchiolitis is responsible for significant morbidity in young children. The duration of hospital stay increases with the decrease of nutritional status.

Mymensingh Med. J 2003; 12(2): 128-33.

EVALUATION OF HOSPITALIZED INFANTS AND YOUNG CHILDREN WITH BRONCHIOLITIS: A MULTI-CENTRE STUDY

Kabir ARML[1], Haq N[1], Hoque M[1], Ahamed F, Amin R[2], Hossain A[3], Khatoon S[4], Shahin A[1], Tanzida S[1], Haq R[1], Anisuzzaman S[1], Khan MH[1], Ahamed S[3], Amirul K[2]

Institute of Child and Mother Health[1], Dhaka Shishu Hospital[2], Dhaka Medical College Hospital[3], SSMC and Mitford Hospital[4], Dhaka

Background: Bronchiolitis is a winter disease and there had been a recent outbreak of the illness in the different hospitals of the country. The diagnosis of bronchiolitis is easily confused with pneumonia and the management differs from that of pneumonia.

Objectives: Four hundred and twenty nine young children with bronchiolitis admitted consecutively in different hospitals of Bangladesh were evaluated. Three hundred and forty eight children studied for their putative risk factors, clinical profile, management and the outcome. Blood of cases and controls were examined for respiratory syncytial virus (RSV) antibody status.

Methodology: The diagnosis of bronchiolitis was made on the basis of first attack of wheeze in previously healthy children below two years of age. Detailed history including the possible risk factors, the management and daily follow-up on the ward and the outcome at discharge were documented through a structured questionnaire. Chest x-ray was done in each case to find out the radiological changes. Blood of 266 patients and 30 controls were studied for RSV IgM and IgG antibody by ELISA.

Results: There were 66% male and 34% female children. The median age of the children was 3.0 months and 82.7% were below 6 months of age. The clinical features of bronchiolitis were mostly cough (99%), respiratory distress (97%), feeding difficulty (93%) and fast breathing (96%) (median RR 68/min). Fever (100°F or more) was in only 33% cases, though parents complained in 90% cases. All children (100%) had wheeze and crackles in lungs in 96% cases. Liver could be palpable in 83% and spleen in 42% cases. Important radiological features were increased translucency (96%), increased interstitial markings (87%), hyperinflation (75%) and streaky densities (61%). In 69.6% cases TLC was 12,000 or less and only 15% with a neutrophil fraction greater than 60%. Children were positive for IgM antibody in 43.6% cases and both IgM and IgG in 5.3% cases. The main modalities of treatment were antibiotics (99%) (Ampicillin, 76%), oxygen therapy (83%), nebulised salbutamol (76%) and intravenous fluid (51%). The median duration of hospital stay was 4 days. Most of the children were discharged with improvement (96%) with 2% mortality. Not a single case was diagnosed as bronchiolitis

The main modalities of treatment were antibiotics (99%) and cefrtiaxone in (72.5%) cases

in hospitals outside Dhaka. Cefrtiaxone (72.5%) and parenteral steroids (70.5%) were the mainstay of therapy there.

Conclusion: Children below six months are the victims of RSV bronchiolitis. Wheeze, cough, chest indrawing, fast breathing and feeding difficulty are the most important clinical features. Increased translucency, increased interstitial markings, hyperinflation and streaky densities are the cardinal radiological features. Antibiotics are widely used along with oxygen and nebulised salbutamol for the management. The median duration in the hospital is 4 days. Mortality is low.

Bangladesh J Child Health 2003; 27(1/2): 6-9

RADIOLOGICAL EVALUATION OF 162 CASES OF BRONCHIOLITIS

Farid Ahmed[1], ARM Luthful Kabir[2], Nazmul Haq[3]

[1]Assistant Professor of Radiology & Imaging, [2]Associate Professor of Pediatrics, [3]Associate Professor of Pathology, Institute of Child and Mother Health, Matuail, Dhaka-1362

Background: Bronchiolitis is a disease of infancy. Clinically it is difficult to differentiate it from pneumonia. The radiologocal features of bronchiolotis were not well studid in our country.

Objective: The study was conducted to evaluate the radiological features of bronchiolitis in hospitalized infants.

Methodology: The diagnosis of bronchiolitis was made on the basis of first attack of wheeze, previous good health, preceding runny nose and low grade fever. One hundred and sixty two hospitalized infants who fulfilled the inclusion criteria were selected for the study. Pattern of identifiable radiological changes in X-rays done during the acute stage was read independently by the radiologist (one of the authors) who was kept blind for clinical situation of the child. The study was conducted in the Institute of Child and Mother Health, Dhaka during November 2001 to March 2002.

Results: Important radiological features were increased translucency (96%), increased interstitial markings (87%), hyperinflation (75%) and streaky densities (61 %). The associated other radiological features were consolidation (31 %), collapse (16%) and ground glass opacity (10%).

Conclusion: An array of radiological changes are possible in bronchiolitis which need clinical correlation. The diagnosis of bronchiolitis could be made from the features of first attack of wheeze in a previously healthy infant with increased translucency, increased interstitial markings and hyperinflation of lung fields on chest radiography

ETIOLOGY OF RESPIRATORY INFECTIONS OF HOSPITALIZED INFANTS IN A CHILDREN HOSPITAL OF DHAKA, BANGLADESH

Kabir ARML, Haq N, Rahman Q, Hossain M, Mannan MA

Institute of Child and Mother Health (ICMH); Dhaka , Bangladesh

Purpose: Hospitalized infants were studied for sociodemographic and clincal features of bronchiolitis and pneumonia and also for common microbiological agents of bacteria, chlamydia and RSV virus.

Methods: Infants (1–12 months) with fast breathing (RR> 50/min) having respiratory distress were selected consecutively for the study. The study was conducted at (ICMH), Matuail, Dhaka during the period of 2003. The previously healthy infants who were admitted with first breathing and first attack of wheeze were clinically diagnosed as bronchiolitis and infants who had fast breathing and chest indrawing without exclusive wheeze were lebelled as pneumonia. A structured questionnnaire was used for face to face interview with mother to collect necessary information about sociodemography, anthropometry, clinical features and hospital course. Induced sputum, nasopharyngeal aspirate and blood were studied for bacteria, RSV virus antigen and chlamydia antibodies (both IgG and IgM).

Results: There were more cases of bronchiolitis, 107 (70.8%) than pneumonia 44 cases (29.1%). Male infants were more vulnerable to bronchiolitis (76.6%) and pneumonia (56.8%) than female counterpart (23.4% and 43.2% respectively, p=.014). The children of both groups shared similar socio-economic and nutritional status like mean number of family members living in one room (bronchiolitis 3.7 Vs pneumonia 3.9), smoking in family (52.3% Vs 63.6%), the mean weight for age (5.4 kg Vs 5.6 kg) and mean supine length (60.4 cm Vs 62.3 cm). The clinical features which were common in both bronchiolitis and pneumonia groups were cough (97.2% Vs 97.7%) , respiratory distress (97.2% Vs 93.2%), H/O fever (94.4% Vs 100%) and poor feeding (86.0% Vs 88.6%), subcostal recession (96.3% Vs 88.6%), palpable liver (85.0% Vs 86.4), mean hemoglobin level (9.7 gm/dl Vs 9.4 gm/dl) and mean duration in the hospital (5.1 days Vs 6.2 days). The two conditions differed as to mean age of occurrence (bronchiolitis 4.5 month Vs pneumonia 5.7 month, p=.02), associated runny nose (62.6% Vs 22.7%), recorded temperature (99.6◦F Vs 101.2◦F, p <0.001), ronchi (97.2% Vs 22.7%, p <0.001.), crepitation (77.6 Vs 97.7%, p 0.001). WHZ >-1 (72.9% Vs 56.8%, p .04), hyperinflation on radiology (97.2% Vs13.6%, p<0.001). Case fatality was higher in pneumonia (18.6%) than from bronchiolitis (4.0%) p <.001. Nasopharyngeal aspirate (NPA) study showed that only one case was RSV positive. The growth of organism from induced sputum was equally distributed in both groups of disorders. Blood culture could only reveal organism in 6 (4%) cases only. Chlamydia antibody was positive in 8.2% for either IgM or IgG.

Conclusion: Bronchiolitis is more common in infants than pneumonia in hospitalized situation. RSV bronchiolitis is uncommon during a non-epidemic time. Superinfection is common in bronchiolitis. Case fatality is higher in pneumonia than in bronchiolitis. Chlamydia pneumonia is also an important condition in infancy.

EFFICACY OF NEBULIZED SALBUTAMOL ALONE VERSUS SALBUTAMOL PLUS IPRATROPIUM BROMIDE IN INFANTS WITH ACUTE BRONCHIOLITIS.

Md. Khalilur Rahman

Dhaka Shishu Hospital, Dhaka, Bangladesh

Background: Bronchiolitis is one of the most prevalent diseases of infancy for which large number of infants need hospitalization particularly during winter period. RSV (Respiratory Syncytial Virus) being the principal causative pathogenic organism. Relieving symptoms is the main aim of management though none of the treatment modalities is specific. Bronchodilators like salbutamol, epinephrine, anti-cholinergic drugs i.e. ipratropium bromide and saline nebulization have been used with varying results.

Objectives: The study was conducted to the comparative efficacy of nubulized salbutamol plus ipratropium bromide versus nebulized salbutamol alone in the treatment of acute bronchiolitis.

Methodology: This prospective study included 60 infants (2-12 months, male:female ration 2:1) with first clinical presentation of bronchiolitis from February 2004 through September 2004 in the emergency department of Dhaka Shishu Hospital to understand the comparative efficacy of nebulized salbutamol plus ipratropium bromide versus salbutamol alone and also to understand the efficacy of nebulized salbutamol and salbutamol plus ipratropium bromide individually. The cases were randomized into nebulized salbutamol plus ipratropium group (n=30) and nebulized salbutamol group (n=30) and consecutive 3 nebulizations were given at the interval of 20 minutes. Outcome of therapy was evaluated by MRDAI (Modified Respiratory Distress Assessment Instrument) score and O_2 saturation before and after therapy. MRDAI includes wheezing at different phases of respiration in different locations of the lungs, chest retraction at 3 locations (supraclavicular, intercostal and subcostal) and respiratory rate.

Results: Study cases in both the groups presented with running nose (100%), cough (100%), wheeze (100%), respiratory distress (100%), feeding difficulty (80%), and fever 40% in salbutamol plus ipratropium bromide group and 33.3% in salbutamol group. Majority (63.3%) of the cases live in urban area. Most of the infants (66.6% in salbutamol plus ipratropium bromide group and 77.4% in salbutamol group) live in well ventilated room.

When comparative efficacy was evaluated it was observed that in both salbutamol group (before nebulization RR-65.3±6.9, MRDAI score- 13.4±1.5, SaO_2-93.0±2.4, after nebulization RR-50.9±6.2, MRDAI.score-7.2±1.0, SaO_2-95.7±2.2) and salutamol plus ipratropium bromide group (before nebulization RR- 66±7.3, MRDAI score-13.9±1.5, SaO_2-92.9±2.2, after nebulization RR-51.9±6.4, MRDAI score-7.4±1.8, SaO_2-96.0±2.5) there was significant (P=<0.001) improvement in MRDAI score and oxygen saturation.

But the difference was not statistically significant (P=>0.05). But heart rate increased (before nebulization HR-130.0±16.9, after nebulization HR- 155.4±15.6 in salbutamol group, before nebulization HR-138.2±21, after nebulization HR-174.6±31, in salbutamol plus ipratropium bromide group after nebulization in both the groups which is statistically significant (P=<0.001).

Conclusion: The study concluded that both salbutamol alone or salbutamol plus ipratropium bromide significantly relieve symptoms and improve oxygenation in infnts with acute bronchiolitis. When comparative efficacy between salbutamol group and salbutamol plus ipratropium bromide group was evaluated it was observed that the difference is statistically insignificant. Infants in both the groups developed tachycardia after nebulization which is statistically significant. But clinical benefit outweighs this side effect of therapy.

STATE OF ART MANAGEMENT OF BRONCHIOLITIS – A REVIEW

Shamsul Arefeen

Dhaka Shishu (Children) Hospital, Dhaka

Introduction: Brochiolitis is the commonest lower respiratory tract infection that usually affects children less than 12 months of age and is the most frequent cause of hospitalization in infants under 6 months of age. It is caused by viral infection of the lower respiratory tract principally by the respiratory syncytial virus, which gives rise to widespread small airway narrowing due to airway oedema, resulting in air trapping. Other pathogens are parainfluenzae, adenovirus mycoplasma pneumoniae etc. It is seasonal and peak activity during winter and early spring.

Objectives of the review are to understand the state of the art management of bronchiolitis and to optimize the treatment by medical practitioners.

Diagnosis: Bronchiolitis is a clinical diagnosis. Cardinal features are nasal obstruction ± rhinorrhoea and an irritating cough is notices first. After 1-3 days there follows increasing tachypnoea and respiratory distress, which may be mild, moderate or severe. Fever of 38.50C or greater is seen in about 50% of infants with bronchiolitis. The chest is often over expanded. Auscultatory signs are very variable: fine inspiratory crackles are often heard early, becoming coarser during recovery; expiratory wheeze is often present, initially high-pitched with prolonged expiration.

According to severity bronchiolitis is classified: Mild, Moderate severe. Mild is characterized by normal ability to feed, mild or no respiratory distress, no requirement of oxygen (i.e. oxygen saturation >95%). Moderate is characterized by moderate respiratory distress with some chest indrawing, nasal flaring, mild hypoxaemia, corrected by oxygen, May appear short of breath when feeding, may have brief apnoeic episodes.

Severe is characterized by unable to feed, severe respiratory distress with marked chest indrawing, nasal flaring and grunting, hypoxaemia, which may not be corrected by extra oxygen. Patients may present with frequent or prolonged apnoeic episodes and tiredness.

For children with mild bronchiolitis, no investigations are indicated, as they will not influence management. For moderate to severe bronchiolitis, the following investigations may be considered: Pulse oximetry, chest radiograph (hypertranlucency and hyperinflation are common radiological features), nasopharyngeal aspirate for RSV and viral culture if possible.

Management: Despite being a common disorder with a known aetiology (RSV being the commonest), the treatment has remained almost unchanged for past more than three decades.

- The only non-controversial part of the treatment is supportive.
- Children with mild bronchiolitis, which form the large majority of the cases, may be treated at home. Antipyretics and treatment of nasal block are most often sufficient, as disease may in its natural course remain mild.
- Children with moderate and severe distress need hospitalization.

Treatment of hospitalized child includes correction of hypoxia with 40% humidified oxygen, fluid therapy, use of bronchodilators (Nebulized/oral salbutamol), nebulized epinephrine, ipratroprium bromide, systemic steroids, ribavirin, antibiotics, specific immunoglobulin.

- Humidified oxygen is the mainstay of therapy in moderate to severe cases.
- Proper hydration should be ensured by continuing breast-feeding. NG tube feeding or IV fluid may be indicated in some cases.
- Nebulized/oral salbutamol can be given every 4-6 hours for 2-3 days and should be discontinued if significant clinical improvement occurs.
- Nebulized epinephrine has been found to be more efficacious than salbutamol and relieves symptoms for a short duration.
- Ipratroprium bromide provides no clinical benefit in bronchiolitis.
- Parenteral dexamethasone may be tried in only severe cases.
- Antibiotics may be given as per ARI guideline (Co-trimoxazole, Amoxycillin, Ampicillin, Procaine penicillin).
- Ribavirin is recommended for the patients with prior diagnosis of congenital heart disease, chronic lung disease, preterm infants, infants younger than 6 weeks old and ventilated patients with RSV infection. Most infants can be discharged in less than 3 days.

Prevention:

- Breast-feeding has an important role in the prevention of bronchiolitis.
- Hand washing of caregivers should reduce the likelihood of spreading RSV infection.
- Respiratory Syncytial Virus IVIG (Antibody derived from adult human sera) reduces the hospital admission rate.
- Palivizumab (Human recombinant monoclonal antibody) particularly effective in high-risk groups like preterm infants.
- Vaccines are thought to be some of the potential preventive strategies for preventing morbidity and mortality, though it is not available so far.

NATIONAL GUIDELINE ON BRONCHIOLITIS
Asthma Association, Bangladesh

ARM Luthful Kabir[1], Md. Ruhul Amin[2]

[1]Institute of Child and Mother Health (ICMH), [2]Bangladesh Institute of Child Health (BICH), Dhaka

Background

There had been outbreaks of bronchiolitis in Bangladesh in the recent years. The bronchiolitis proved to be due to respiratory syncytial virus (RSV). Till the recognition of the fact that a large number of young children in this country are the victims of bronchiolitis, any young child presenting with fast breathing and chest indrawing used to be labeled as pneumonia. These children are indiscriminately treated with costly antibiotics (e.g. ceftriaxone). There is fair chance of recurrent wheeze following an attack of RSV bronchiolitis and so it is important to consider the diagnosis of bronchiolitis to counsel the parents beforehand.

We need also to practice rational use of antibiotics in children with respiratory distress. Frequent administration of antibiotics in childhood may lead to development of asthma in later life. Recently conducted "Asthma Risk Factor Study of Asthma Association and some other published reports suggest that, in a genetically prone infant, exposure to bronchiolitis strongly correlates with development of asthma in future.

What is bronchiolitis?

Bronchiolitis is an inflammatory disease of the smallest airways (bronchioles) and is the leading cause of respiratory distress of small children. It is a clinical diagnosis, characterized by cough and respiratory distress associated with wheeze, preceded by runny nose with or without fever in young children below 2 years of age particularly between 2-6 months of age. Apparently, the disease appears to be pneumonia but actually it is a different entity. Viruses are the causes of bronchiolitis. Respiratory Syncytial Virus (RSV) is the most important cause of bronchiolitis.

Case definition of bronchiolitis

- Child below 2 years
- Respiratory distress associated with wheeze
- Preceded by runny nose

Assessment

A. History
   - Age
   - Duration of illness
   - Runny nose
   - Cough
   - Inconsolable cry
   - Restlessness
   - Breathing difficulty
   - Feeding difficulty

Physical examination

- Nasal flaring
- Fast breathing
- Full chest
- Chest in-drawing
- Vesicular breath sound
- Rhonchi
- Crepitation
- Cyanosis

What are the risk factors of bronchiolitis?

Age : It is mostly a disease of infancy. Most of the children are below 6 months of age with the median age being 3 months.

Sex : Male children are more vulnerable (male female ratio 1.9:1)

Seasonality : Bronchiolitis affects young children particularly in winter and rainy seasons. It sometimes occurs in epidemics. There were epidemics of bronchiolitis in Bangladeshi children in the year of 2001-2002 and again in 2003-2004.

Prematurity : Babies who are born preterm are at risk to develop bronchiolitis.

Lower socioeconomic condition: Rates of hospitalization with bronchiolitis is more in lower socioeconomic status.

Non-breast feeding: Breast-feeding seems to protect against bronchiolitis.

Crowded environment: Infants who reside in crowded environment and have older siblings may be at risk of bronchiolitis.

Passive smoking : Exposure to passive smoking, particularly maternal smoking, has been shown to be a risk factor for bronchiolitis.

Wood-burning stoves: Children living in homes with wood burning stoves are at higher risk of bronchiolitis.

How bronchiolitis is classified?

Based on severity of clinical features, bronchiolitis is classified into mild, moderate and severe.

Features	Mild	Moderate	Severe
Feeding	Normal	With difficulty	Unable to drink or take feed
Respiratory distress	Mild (Mild chest indrawing)	Moderate (chest indrawing and nasal flaring)	Severe (chest indrawing, nasal flaring, grunting and cyanosis)
Hypoxaemia	No clinical	Mild to moderate	Severe hypoxemia
Hypoxemia: restlessness, inconsolable crying and $S0_2$ < 95%			

Investigations (not mandatory)

- WBC total count: normal
- Chest x-ray: hypetranslucency and hyperinflation

What are the typical radiological features in bronchiolitis?

Evidence of air trapping in both lungs like hypertranslucency, increased interstitial markings and hyperinflation are important radiological features.

How to differentiate bronchiolitis from pneumonia and asthma?

When viruses (mainly RSV) affect bronchioles the disease is called bronchiolitis. Whereas, pneumonia is resulted when bacteria, virus or other organisms affect alveoli. Though there are apparent similarities in the symptomatology of pneumonia and bronchiolitis, there are distinct differences in the etiology, investigative reports, treatment, outcome and prognosis of these two illnesses. So, it is important to differentiate bronchiolitis from bacterial pneumonia. On the other hand asthma is not an infectious disease, but in children it may present with some features similar to bronchiolitis.

Features	Bronchiolitis	Pneumonia	Asthma
Age	0-2 years, peak < 6 mo	Any age	Usually after 1 year
Runny nose	Present	Usually absent	May be present
Wheeze	Present	Usually absent	Present
Temperature	Low grade	Moderate to high	Absent
Crepitations	++	+++	Absent
Rhonchi	+++	+	+++
Total WBC count	Normal	Neutrophilic leukocytosis	Normal with eosinophilia
CXR	Hypertranslucency and hyperinflation	Consolidation or patchy opacities	Hyperinflation
Response to bronchodilators	Doubtful	No response	Good
Prognosis	Chance of subsequent recurrent wheeze	Complete recovery	Recurrent attack

MANAGEMENT OF BRONCHIOLITIS

A. Home management

Home management is advised for mild bronchiolitis.
It includes only supportive care:

- Head up position
- Normal feeding (breast and otter feeding)
- Cleaning of nose with normal saline drops
- Bathing with lukewarm water
- Paracetamol suspension for fever
- Administration of salbutamol, theophylline, ketotifen and antihistamines are not helpful

Return to doctor/ hospital if child:

- becomes toxic
- develops high fever
- has feeding difficulty

B. Hospital management

1. Supportive measures- same as home care

- Airway clearance with OP suction in case of profuse secretions
- Nutrition through NG tube feeding or IV 10% dextrose in 0.225-0.45% saline

2. Specific measures

- humidified oxygen is the mainstay of therapy. 40% oxygen through cannula/ nasal prongs/face musk until clinical improvement occurs. Indications for oxygen therapy are any of the following:
  - Central cyanosis
  - Not able to drink
  - Restlessness
  - Severe chest indrawing
  - Grunting
  - Apnea
  - RR > 70/ min
- Bronchodilators

  Nebulized salbutamol (0.15 mg / kg / dose) 4-6 hourly for 2-3 days

  Oral salbutamol and theophylline has no conclusive evidence of benefit Ipratropium bromide- not helpful
- Steroids- parenteral dexamethasone may be tried only in severe cases (benefit is doubtful)
- Antibiotics- usually has no role, if there is suspicion of pneumonia with *Streptococcus pneumoniae,* which is common in this age group, at best oral antibiotic according to "guidelines for antibiotic use in childhood pneumonia".

Clues to suspicion of pneumonia:

- toxic appearance
- total WBC: neutrophilic leukocytosis, >15000/cmm
- lobar consolidation or patchy opacities

When to discharge (wheeze/ mild chest indrawing is not a contraindication)

- No requirement of oxygen therapy
- Return of social smile
- Can feed adequately

Counseling to parents about bronchiolitis

- It is not pneumonia
- Mostly self-limiting disease

- Home care is enough in most of the cases
- Cough may persist for 2 or more weeks
- Fair chance of subsequent recurrent wheeze

Prevention

- Hand washing: before and after handling the affected child by health care provider
- Breast feeding
- Avoidance of passive smoking

Guidelines for antibiotic use in childhood pneumonia

- In tropical countries the common causes of bacterial pneumonia in children (below 5 years) are *Streptococcus pneumoniae*.
- Gram negative organisms, especially *Escherichia* coli and *Klebsiella pneumoniae* along with *Chlamydia trachomtis* are important causes of pneumonia in young children below 6 months of age.
- The atypical organisms are more likely to cause community acquired pneumonia (CAP) in older children. *Mycoplasma pneumoniae* is common from the age of 5 years onwards and *Chlamydia pneumonae* is common from the age of 10 years. Chamydia trachomatis is involved in pneumonia at younger ages- 3 weeks to 3 months.
- Mixed viral-bacterial infections have been especially common in young children under 2 years of age, reflecting the high frequency of RSV infections and their tendency to induce bacterial co-infections.
- The high resistance of *Streptococcus pneumoniae* to co-trimoxazole needs reconsideration of the recommendation of WHO for co-trimoxazole administration in CAP in children of Bangladesh.
- Initial antibiotics must be effective against *Streptococcus pneumoniae.*
- Macrolides (indicated for Cldamydin and Mycoplasma pneumonia*):* Erythromycin, azithromycin and clarithromycin
- Beta lactum: cefuroxime, cetriaxone, cefotaximc, co-amoxiclav, cefpodoxime
- Staphylococcal pneumonia should be treated with cloxacillin, flucloxacillin or a beta-lactamase resistant drugs or vancomycin (in MRSA).

Dosage of the antibiotics

Benzylpenicillin	100 mg/kg/ day in 4 divided doses (slow IV)
Amoxicillin	40-50 mg/kg to 80-100 mg/kg 8 hrly, 7-10 day (oral or IV)
Ampicillin	50-100 mg/kg/day (oral or IV)
Cefpodoxime	8 mg/kg/day in 2 divided doses (oral)
Cefuroxime	50-100 mg/kg/day oral or IV
Gentamycin	4 mg /kg/day for 7-10 days (IV)
Amikacin	15 mg/kg/ day in 2 divided doses (IV)
Co-amoxiclav	Amoxicillin 25 mg/kg per dose every 8 hours (oral or IV)

Azithromycin	10 mg/kg/day once daily for 5 days (oral)
Clarithromycin	15 mg/kg/day in two divided doses for 10 days (oral or IV)
Vancomvcin	15 mg/ kg initially, then 10 mg/kg every 6-8 hours

Age	Antibiotics options	Remarks
0-6 months	1. Penicillin 2. Amoxicillin 3. Macrolides 4. Cefpodoxime	For non-severe pneumonia
	5. Ampicillin + Gentamycin 6. Beta lactum + aminoglycosides	For hospitalized children with pneumonia
7-24 months	1. Penicillin 2. Amoxicillin 3. Cefpodoxime	For non-severe pneumonia
	1. Ampicillin+Cloxacillin/ Flucloxacillin 2. Beta lactum inhibitor + Macrolides	For hospitalized children with pneumonia

- Children should be switched to oral therapy as soon as possible. This reduces cost of therapy, allows early discharge from hospital and reduces the risk of nosocomial infections.
- The guideline is useful in children up to 15 years of age

[Source: Bangladesh Paeditric Pulmonology Forum]

EFFICACY OF ORAL PREDNISOLONE IN THE TREATMENT OF ACUTE BRONCHIOLITIS: A RANDOMIZED CONTROLLED TRIAL (RCT)

Ahmed Sayeed, Md. Ekhlasur Rahman

Department of Paediatrics, Sylhet M.A.G Osmani Medical College Hospital, Sylhet, Bangladesh

Background: Experimental and clinical evidence suggests that acute bronchiolitis is an immune mediated disease. Corticosteroids might therefore be effective in treating acute bronchiolitis.

Objective: The study was conducted to determine the effect of oral prednisolone on respiratory rate, chest indrawing, length of time needed to become symptom free (no coughing or wheezing for consecutive 48 hrs), reduction in the need of supplemental parentaral fluid and adverse effects of prednisolone, if any.

Methodology: This double blind placebo controlled trial included 88 patients of below 2 years of age having first attack of respiratory distress preceded by acute coryzal attack with concomitant chest x-ray findings (hyperinflation & patchy infiltrates, with/without focal atelectesis) during the study period ranging from January 2005 to December 2005 in the inpatient department of Sylhet M.A.G Osmani Medical College Hospital to understand the efficacy of prednisolone in the treatment of acute bronchiolitis.

The patients were randomly allocated to prednisolone group (n=44) and placebo group (n=44) by lottery method. The study group was given prednisolone (2mg/kg/day) after crushing & making it powder orally or through NG tube for three consecutive days in divided doses. The same volume of flour (placebo) was given to control group either orally or through NG tube for the same duration in divided doses. The traditional treatment (O_2 inhalation, correction of dehydration, nebulized salbutamol 6 hourly, inj. Ampicillin) was given to both prednisolone and placebo group. In both the groups, symptoms like cough & not feeding well, signs like respiratory rate, temperature, chest indrawing, wheezing, adverse effects of prednisolone, were used as outcome variables.

Result: Cent percent cases presented with cough, respiratory distress, fast breathing, chest indrawing, wheeze but only 79% cases were febrile at the baseline. Clinical outcome of the patients were measured at the end of 24 hr, 48 hr & 72 hr. At the end of 24 hr, prednisolone significantly reduced respiratory rate 9% vs. 2.2% (P=<0.05), wheeze 22.7% vs. 6.8% (P-<0.02).

At the end of 72 hr, prednisolone significant reduced respiratory rate 81.8% vs. 36.37% (P=<0.02), chest indrawing 81.8% vs. 40.9% (P=<0.02), wheeze 97.7% vs. 50% (P=<0.05). Prednisolone also reduced the requirement of supplemental parentaral fluid in acute bronchiolitis cases at the end of 24 hr, 48 hr & 72 hr significantly (P=<0.001).

Half of our study population had positive family history of atopy, defined as either a parent or sibling with asthma, atopic dermatitis, allergic rhinitis, allergic conjunctivitis. Taking the family history of atopy into account, at the end of 72 hrs, prednisolone

signicantly decreased fast breathing (P=<0.05), chest indrawing (P=<0.005), wheeze (P=<0.001), requirement of supplemental parentaral fluid (P=<0.001) in comparison to placebo group. Side effects were observed among both the groups which were not statistically significant (P=0.5).

Conclusion: This study showed that prednisolone is effective in accelerating the clinical recovery of children admitted to hospital with acute bronchiolitis.

RISK FACTORS FOR BRONCHIOLITIS

Md. Azizur Rahma Khan, Md. Nurul Absar

Ranpur Medical College Hospital, Rangpur

Background: Risk factors for bronchiolitis have been studied in different countries, but it has not been adequately explored in our country.

Objective: A case-control study was done to identify the risk factors of bronchiolitis in our population.

Methods: It was carried out in Rangpur Medical College Hospital, rangpur from January 2007 to June 2007. Sixty infants and young children with bronchiolitis were studied for the possible risk factors and were compared with sixty children without bronchiolitis. Data were collected with a predetermined questionnaire. The questionnaires were filled up through a face to face interview with mothers, clinical examination and for the cases chest radiograph also.

Results: The mean age of children with bronchiolitis was 5.0 months and that for the controls was 4.7 months. Male children were found to suffer more than female peers (M:F=4:1) and so in case of preterm than term (OR 3.8, 95% CI 1.0-14.6, p=0.04). The chance of bronchiolitis was four times if parents were poor (OR 4.2, 95% CI 1.9-9.1, p=<0.001). The children were more likely to suffer from bronchiolitis if the fathers were illiterate (OR 3.6, 95% CI 1.3-9.8, p=0.011). Children exposed to environmental tobacco smoke were almost four times more prone to develop bronchiolitis (OR 3.7, 95% CI 1.8-7.9, p-0.001). No significant relation with bronchiolitis was found in case of birth weight, breast feeding practice, maternal literacy, overcrowding, consanguinity of parents, positive family history for asthma, use of wood in domestic fireplace and nutritional status.

Conclusion: Male sex, prematurity, fathers illiteracy, poor economic condition and exposure to environmental tobacco smoke are potential risk factors in the study population.

EFFECTS OF CORTICOSTEROID IN ACUTE BRONCHIOLITIS

Abul Kalam Azad, Badrul Alam

MD (Paediatrics), Part-III, Department of Child Health, Chittagong Medical College, Chittagong

Background: Acute bronchiolitis is one of the commonest respiratory problems in childhood. Corticosteroids are commonly used to teat. bronchiolitis, but evidence of their effectiveness is limited.

Objective: This study was designed to see the effects of corticosteroid in patients with acute bronchiolitis.

Methodology: It was a cross-sectional case control study. The place of study was the pediatric in-patient department of Chittagong Medical College Hospital, Bangladesh. The patients of 2 months to 24 months of age of both sexes who fulfilled the inclusion and exclusion criteria were included in the study. Samples were collected by simple random sampling. Total 100 cases were included in the study that was divided into two groups (group-1 and group-2) with 50 cases in each group. After admission proper history and clinical examination was performed and conventional treatment was started. Group-1 received Injection dexamethasone 0.5mg/kg/day intravenously for three days.Group-2 received same amount of distilled water as placebo and was taken as control group. Day to day follow up was given and the outcome was measured by change in respiratory distress assessment score (RDAS) and length of stay (LOS) in the hospital. Data was collected in a questionnaire and was analyzed by SPSS version 12.

Result: Baseline characteristics were similar in two groups. Mean RDAS reduction by day 4, was 5.14 ± 1.65 in treatment group 1 and 4.44 ±1.34 in treatment group 2. The 2- tailed t-test with 95% confidence interval shows the difference is statistically significant (P=<0.05) (Table - 5.1). Differences of LOS in the hospital was not statistically significant between two groups.

Conclusion: The results of the study demonstrated that dexamethasone significantly decreases clinical severity of acute bronchiolitis in hospitalized patients.

EFFICACY OF ORAL PREDNISOLONE IN RELIEVING HYPOXIA IN CHILDREN WITH ACUTE BRONCHIOLITIS WHO HAVE A HISTORY OF ATOPY: A RANDOMIZED CONTROL TRIAL (RCT)

Akhlaq Ahmed, Shakil Ahmed, Md. Ekhlasur Rahman

Sylhet MAG Osmani Medical College, Sylhet

Background: Bronchiolitis is mostly (95%) a viral disease cause inflammation of the smallest airways. Experimental and clinical evidence suggest that acute bronchiolitis in an immune mediated disease and history of atopy is one of the determinants of disease severity. Hypoxia is one of the major complications of acute bronchiolitis.

Methodology:
Objective: This study was carried out to find out the efficacy of oral prednisolone in relieving hypoxia in acute bronchiolitis who have a history of atopy.

Study design: It was a randomized double blind placebo controlled trial. The study was carried out in the department of paediatrics, Sylhet MAG Osmani Medical College Hospital, Sylhet between January 2006 to December 2007.

A total of 96 patients admitted in the department of paediatrics having a history of atopy fulfilling the selection criteria were enrolled as study population by systematic random sampling. Group allocation to either prednisolone or placebo was done by lottery method. The trial was so planned that neither the parents nor the investigator were aware of group allocation. Prednisolone (2mg/kg/day) was given orally for three consecutive days in divided doses. The same amount of flour (placebo) was given in the same way. The standard treatment of acute bronchiolitis was given to both groups.

Following randomization and intervention, monitoring was done by recording the presence or absence of head nodding, nasal flaring, chest indrawing and wheeze; frequency of respiratory rate twice daily for 3 days. SpO2 was measured by pulse oximeter 8 hourly for 3 days.

Result: Baseline characteristics of both groups were comparable. The clinical variables of acute bronchiolitis decreased significantly faster in the prednisolone group – returning of head nodding ($p<0.02$) and nasal flaring ($p<0.05$) to normalcy occurred in 12 hours; respiratory rate returned back to normal in 36 hours ($p<0.01$); chest indrawing ($p<0.001$) and wheezing ($p<0.01$) were normal in 72 hours. Duration of O2 therapy was less (22 hrs) in the prednisolone group than in the placebo group (27 hrs). Length of hospital stay was shorter in the prednisolone group ($p<0.02$) compared with placebo group. No patient developed any adverse event during the study period.

Conclusion: Three day oral prednisolone treatment was effective in accelerating clinical recovery (i.e., head nodding, nasal flaring, fast breathing, chest indrawing and wheezing) in acute bronchiolitis cases who had a history of atopy. Prednisolone treatment reduced the length of hospital stay significantly and was found safe.

Bangladesh Med. Res. Coun Bull 2008; 34(3): 112

EFFICACY OF NEBULIZED IPRATROPIUM BROMIDE VERSUS SALBUTAMOL IN INFANTS WITH ACUTE BRONCHIOLITIS

Absar SM, Jahan S, Khanum S

Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka

Background: Bronchioldis is one of the most prevalent diseases of infancy for which large number of infants need hospitalization particularly during winter period. RSV (Respiratory Syncitial Virus) is he principal causative pathogenic organism. Reliving symptoms is the main aim of management though none of the treatment modalities is specific. Bronphodilators like salbutamol, adrenaline, anti-cholinenrgic drugs like ipratropium bromide and saline nebulization have been used with varying results.

Objective: To understand, the efficacy of nebulized salbutamol and ipratropium individually and also to understand the comparative efficacy of nebulized salbutamol - with., ipratropium in bronchiolitis.

Methodology: This prospective study included 60 infants (2-12 months, male: female ratio 2:1) with bronchiolitis (with 1st episode of . wheeze, previously healthy baby, physical findings with cough, running nose, fever, coryza and inflation of lungs) from July 2003 through December 2004 in paediatric department -of BSMMU. The cases were randomized into nebulized salbutamol group (n=30) and nebulized ipratropium group (n=30). After randomization 3 nebulization were given at the interval of 20 minutes. Outcome of therapy was evaluated by respiratory rate, MRDAI (Modified Respiratory Distress Assessment Instrument) score and O_2 saturation before and after therapy. MRDAI includes wheezing at different phases of respiration in different locations of the lungs, chest retraction at 3 location (supraclavicular, intercostal and subcostal) and respiratory rate.

Results: Study cases in both the groups presented with cough (100.0%), respiratory distress (100.0%), feeding difficulty (80%), running nose (100.0%) and wheeze (100.0%). Majority of the cases live in urban area and mostly from non-smoking family. Most of the infants (66.6% in salbutamol gr. and 77.4% in ipratropium gr.) live in well-ventilated room. In salbutamol group respiratory rate, MRDAI score and 0_2 saturation (before nebulization respiratory rate- 65.3 ± 6.9, MRDAI score- 13.4 ± 1.5, SaO_2 93.0 ± 2.4 and after nebulization respiratory rate- 50.9 ± 6.2, MRDAI score7.2 ± 1.6, $Sa0_2$- 95.7 ± 2.2) significantly improved after 3 nebulization. In ipratropium group respiratory rate, MRDA score and 0_2 saturation (before nebulization respiratory rate- 65.6 ± 7.3, MRDAI score- 13.9 ± 1.5, $Sa0_2$92.9 ± 2.1 and after nebulization respirator` rate- 51.9 ± 6.4, MRDAI score7.4 ± 1.8, $Sa0_2$- 96.0 ± 2.5) also significantly improved after 3 nebulization. Improvement was significant in both group-. Heart rate in both groups were increased (in salbutamol gr.- 155.4 ± 15.6 and in ipratropium gr.- 174.6 ± 31) but more in ipratropium group. When comparative efficacy evaluated, it was observed that neither of the therapy was significantly superior to each other.

Conclusion: The present study concluded that nebulized ipratropium is as effective as nebulized salbutamol in relieving symptoms in cases of acute bronchiolitis.

RISK FACTORS OF BRONCHIOLITIS IN YOUNG CHILDREN (02-24 MONTHS)

Farhana Mumtaz Papree

Department of Paediatrics, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh, and Bangladesh Institute of Child Health and Dhaka Shishu (Children) Hospital, Dhaka, Bangladesh

Background : Bronchiolitis, caused by viruses such as RSV and rhinovirus, is the leading cause of LRTI in infants. This viral lower respiratory infection affects children up to the age of 24 months, with younger infants often more severely affected.

Objective: The study was conducted to observe the risk factors of bronchiolitis.

Methodology: The present descriptive, cross sectional study included 100 children of 02-24 months of age with bronchiolitis. Clinical history was taken and physical examination was done. All the relevant information's regarding age, sex, date of birth, weight, gestational age, birth weight, month of birth, breastfeeding status, number of siblings, maternal age, maternal atopy, parental education, parental smoking, history of asthma in parents, family's monthly income, housing, number of members sharing a room, kitchen stove were recorded by interviewing the attending mother or care giver.

Results: Of 100 children, 92 percent (92.0%) children were younger than 12 months of age and 66 percent (66.0%) were from 02-06 months of age. Boys were predominantly affected (male 68% vs. female 32%). About a third of children (34.0%) had history of maternal atopy. Maternal asthma were observed in 10 percent (10.0%) cases. Majority of children (67.0%) were not exclusively breastfed. Ninety percent (90.0%) were exposed to passive smoke; 55(61.1%) by parental smoking whereas 48 (53.3%) by wood burning kitchen stoves. Forty four percent (44.0%) subjects had no siblings. Forty two percent (42%) had one or two siblings and 14 percent (14.0%) had more than two siblings. Majority of cases came form lower socioeconomic background. Sixty percent (60.0%) of study population were urban resident and from over crowded housing and forty percent (40.0%) for rural area. Forty two percent (42.0%) of the subjects belonged to families with monthly income TK 5000 or less, 32 percent (32.0%) had TK 5001 to 10000 and 26 percent (26.0%) had TK more than 10000 per month. Mean years of schooling in case of mothers were 7.9±3.8 years and in case of fathers were 6.3±5.2 years. Thirty six percent (36.0%) fathers and 12 percent (12.0%) mothers had no education at all. Fifty percent (50.0%) of the fathers were service holder, 22 percent (22%) were day labor, 24 percent (24.0%) were small trader and 4 percent (4.0%) were farmer.

Conclusion: The study conclude that young age, male gender, lack of breast feeding, passive smoke exposure and maternal atopic diseases were commonly observed among the cases of bronchiolitis.

SEPTIC EVALUATION OF BRONCHIOLITIS IN INFANTS WITH OR WITHOUT FEVER

Mamun Reza Khan, ARM Luthful Kabir

Faculty of Paediatrics, Institute of Child and Mother Health (ICMH), Matuail, Dhaka

Background: Concomitant bacterial infection in bronchiolitis is usually is uncommon.

Objective: A prospective case series comparative study was conducted to see the risk of serious bacterial infection in febrile bronchiolitis compared with afebrile bronchiolitis.

Methodology: The study was conducted at ICMH, for a duration of 28 months in the years 2007-2008. Infants (2-12 months) with clinical bronchiolitis attending the ICMH paediatrics indoor fulfilling the inclusion criteria was enrolled in the study. Total 118 cases of clinical Bronchiolitis was enrolled according to the inclusion and exclusion criteria. Out of that 64 cases (54.2%) were in afebrile bronchiolitis group, that means bronchiolitis without fever (temp<100.4^{0}F or 38^{0}C) and 54 cases (45.8%) were in at febrile bronchiolitis group, that means bronchiolitis with fever. The data collection was done through a prefixed structured questionnaire and conducted by the principal investigator himself. Interview of the parents was taken after inclusion of the patient as a study case and then the investigations (CXR, CBC, ESR, PBF, CRP, blood culture, urine R/E, C/S, induced sputum R/E, C/S) was sent. Then the clinical presentations and radiological signs and heamatological mean values and culture reports were compared between afebrile bronchiolitis and febrile bronchiolitis groups.

Results: As a whole bronchiolitis was more common in male, complain about fever in febrile bronchiolitis group was 96.3% where as in afebrile bronchiolitis group 53.1%, the mean temperature in febrile bronchiolitis group was 101.3^{0}F and in afebrile bronchiolitis group was 98.9^{0}F which is statistically significant, but yet grade of fever even in study group is not high. In radiological findings, hyperinflation was 92.2% and hyperlucency 90.6% in afebrile bronchiolitis group and 82.2%, 83.3% in febrile bronchiolitis group. But the patchy opacity and consolidation were more marked in febrile bronchiolitis group (94.4% and 48.1%) than in afebrile bronchiolitis group (75% and 25%). In comparison of different hematological values, mean hemoglobin was almost same in both groups but mean ESR, mean WBC count, mean DC neutrophil count and CRP raised significantly in febrile bronchiolitis group. Culture became positive in 33.05% cases. Blood culture became positive in 20.3% of all cases. Urine culture became positive in 5.9% cases. And induced sputum became positive in 9.3%, out of 39 culture positive cases only 3 cases had more then one culture positive, out of those 3, 2 cases belongs to study group and 1 case control group, none of the cases had all 3 culture sample positive. In comparison between febrile bronchiolitis and afebrile bronchiolitis group urine and induced sputum culture results revealed no statistical significant difference. But in the blood culture in febrile bronchiolitis group total 16 (25.3%) cases and in afebrile bronchiolitis group 8(12.5%) cases were positive and which was significant. But when the blood culture positive results compared with concomitant hematological reports in support of sepsis it revealed that in the afebrile bronchiolitis group total 8 cases were culture positive. Only in 2 cases there were WBC count more

then 12000/cu mm (case no 87 and 107) but in both that cases there were CRP value 6 mg/dl and only 1 case there was neutrophil count more than 60% (case no 87) and these findings do not represent true infection. Among these cases mean WBC count was 10000/cu mm, mean neutrophil count 33.5%, mean CRP 9 and mean ESR was 16. On the other hand, in 2 cases (case no 105, 107) there were *Staphylococcus* (couagulase negative) and 2 cases (case no 11, 27) were *Staphylococcus epidermidis* which are all usually become positive due to contamination. These findings do not suggest true sepsis.

In febrile bronchiolitis group out of 16 blood culture positive cases, there was no concomitant leukocytosis (WBC >15000/cumm) in 13 cases, no significantly raised CRP in 14 cases, no neutrophilia (>60%) in 11 cases and only in 3 cases there were very raised ESR (ESR >50 mm in 1st hour). Only in 3 cases (case no 81, 89,91) WBC count were more than 15000/cumm and among them 2 cases had no significant raised CRP and ESR. And two cases (case no 81, 89) had *Staphylococcus* (couagulase negative) positive which are usually become positive become positive due to contamination. Only one case (case no 91) had all the evidence (Enterococcus positive, WBC 18000/cu mm, neutrophil 90%, CRP 24 mg/dl and ESR 92 mm in 1st hour) of sepsis. No case was found showing the growth of same organism in all 3 or at lest 2 sample of blood, urine and induced sputum. On the other hand 7 cases out of 16 cases there were *Staphylococcus* (couagulase negative) which are usually become positive due to contamination in febrile group. So these results do not suggest true sepsis. And the possible cause of culture positive may be due to contamination. So true sepsis cases supported by all evidences in afebrile and febrile bronchiolitis groups was 0 vs 1 and the difference was not significant.

Conclusion: So as a whole we can say that possibility of bacteremia in febrile bronchiolitis and afebrile bronchiolitis are both low and there is no difference in two groups in this study.

RADIOLOGICAL FEATURES OF BRONCHIOLITIS- A STUDY OF 198 CASES

Afsana Mukti, AS Mohiuddin, Bikash Majumder, ARM Luthful Kabir

Dhaka Medical College Hospital and Institute of Child and Mother Health, Dhaka

Background: Bronchiolitis is the commonest cause of acute lower respiratory tract infection (ALRTI). The radiology of bronchiolitis was not well studied in our context.

Objectives: The study was conducted to identify the various radiological features of bronchiolitis.

Methods: It was a cross sectional study and conducted in Dhaka Medical College Hospital and Institute of Child and Mother Health, Matuail Dhaka in 2008. The diagnosis of bronchiolitis was made on the basis of runny nose followed by respiratory distress and chest indrawing in a child below 2 years of age. Children with atopic conditions, congenital heart disease, immunodeficiency (consanguinity between parents with recurrent chest infection) and chronic lung disease (bronchopulmonary dysplasia) and parents not giving consent were excluded from the study. A total of 198 cases of bronchiolitis who fulfilled the inclusion criteria were analysed. A structured questionnaire was filled up by one of the investigators (Afsana Mukti) while taking face to face interview of the care taker (mostly mothers). Detailed history was taken and full physical examination was done. Chest X-ray and necessary investigations were done immediately after admission. All X-ray films were studied by two qualified radiologists who were kept blind about the patients' conditions and finally all the CXRs were reevaluated by one pediatric pulmonogist. Two radiologists reported independently and the documentation was recorded in printed forms. The consensus report of the radiologists was accepted as positive findings. The individual report of one radiologist, not supported by another radiologist was taken positive when the pediatric pulmonologist agreed. An obvious finding missed out by both the radiologists was included when the pediatric pulmonogist thought positive.

Results: Bronchiolitis was found more (73%) common in children below 6 months of age and in male children (73%). In 100% cases, the children had runny nose, cough, breathing difficulty, chest indrawing and rhonchi on auscultation. Other important features were feeding difficulty (84%), crepitation (82%), wheeze (77%), sleeping difficulty (76%), restlessness (66%), nasal blockade (57%) and nasal flaring (56%). The mean WBC count was 9917/cmm with 40% neutrophils and mean CRP was 15.3 mg/dl.

The radiological features were as follows in order of frequencies: hyperinflation (85%), increased translucency (60%), increased interstitial markings (60%), streaky densities (44%), dirty lungs (33%), confluence of opacities (16%), ground glass opacity (9%), consolidation (8%), patchy opacity (4.5%), collapse (1.5%) and normal (1.5%).

Conclusion: The most common radiological features of bronchiolitis were hyperinflation, increased translucency, increased interstitial markings, streaky densities and dirty lungs.

CXR: Hyperinflation in Bronchiolitis

CXR: Increased translucency in Bronchiolitis

PREDICTION OF LENGTH OF HOSPITAL STAY AND IMMEDIATE OUTCOME OF CHILDREN SUFFERING FROM BRONCHIOLITIS ON THE BASES OF ASSOCIATED RISK FACTORS, INITIAL BLOOD COUNT AND RADIOLOGICAL FINDINGS

Bithi Debnath, Md. Azizul Haque

Department of Pediatrics, Mymensingh Medical College Hospital, Mymensingh, Bangladesh.

Background: Unexpected and substantial increases in hospitalization rates as a result of acute bronchiolitis among infants and young children point to the growing public health burden of this disease. Hospital care for children with bronchiolitis is highly variable, and its relationship to severity and impact on outcome is unclear. The yearly cost for bronchiolitis hospitalization imposes an economic hurden to a great extent.

Objective: This case series observational study was conducted to determine the relationship of associated risk factors, initial blood count and radiological findings on the length of hospital stay and to predict the immediate outcome. This study also tried to identify factors associated with safe discharge to home and therefore re-defined the criteria to reduce unnecessary hospitalization.

Methodology: In this series, bronchiolitis was diagnosed clinically and those who fulfilled the inclusion criteria were enrolled in this study. Total 100 patients were included who were admitted in the Department of Pediatrics, Mymensingh Medical College Hospital during the period of November 2007 to June 2008. Complete blood count and chest X-ray were sent for every enrolled case on admission. All data were recorded in a pre-tested questionnaire and analyzed by SPSS 12.0 for windows.

Result: Among 100 enrolled patients, 60% was hospitalized for 4 days or more. Mean duration of hospital stay was 4.37 days. Patients of male sex, younger than 6 months of age, preterm birth were hospitalized for longer duration. Length of hospitalization was also increased in patients with family history of asthma and or smoking, using wood-burning stoves for cooking and no previous history of respiratory distress. Exclusively breast fed infants stayed hospital for shorter duration then those who fed both breast milk and artificial food or only took artificial milk. Patients having normal leukocyte count and positive radiological findings were hospitalized for longer duration when compared with other variables. All patients improved in this case series. Patients having feeding difficulty or features suggestive of hypoxia or air trapping were needed to be hospitalized because IV fluid, assisted feeding and /or supplemental oxygen were required to manage these patients that made their hospitalization mandatory.

Conclusion: Male infants, younger than 6 months, cases with family history of asthma, smoking, using wood burning, stoves for coking and non breastfeed infants. Cases were also hospitalized with positive radiological findings.

Pakistan Journal of Medical Science 2008; 24(5): 707-711

ROLE OF ANTIBIOTIC IN THE OUTCOME OF BRONCHIOLITIS

CH Rasul[1], ARML Kabir[2], AKMM Rashid[3], AA Mahboob[4], MA Hassan[5]

[1]Professor of Paediatrics, [2]Professor of Paediatrics, Institute of Child & Mother Health, Dhaka – Bangladesh, [3]Associate Professor of Paediatrics, [4]Assistant Professor of Paediatrics, [5] Assistant Professor of Paediatrics, [1,3-5:] Khulna Medical College & Hospital, Khulna - 9000

Objective: To estimate the outcome of bronchiolitis with or without antibiotic to justify the avoidance of antibiotic.

Methodology: This was a prospective study done in Khulna Medical College Hospital during six months from October 06 to March 07. All the children below two years 2007-2008 admitted in hospital with bronchiolitis were included in the study. The study cases were randomly assigned into one of the three groups - No Antibiotic, Oral Antibiotic and Parenteral Antibiotic. Presenting signs and symptoms were followed up thrice daily to determine the progress of disease. Outcome was estimated by the level of improvement.

Results: Sixty cases of bronchiolitis were included in this study. Most (80%) of them were below six months. The disease was frequently associated with similar problem in siblings (46.7%), noncompliance to exclusive breast feeding (38.3%) and family history of asthma (36.7%). Symptoms like sleeping difficulty and restlessness improved little earlier in No Antibiotic group. On the other hand, signs such as chest indrawing and hepatomegaly improved quicker in Parenteral Antibiotic group although the difference was statistically insignificant. Patchy opacities were found in chest x-ray in 45% cases. None of the study cases died but three of them needed special intervention. Hospital stay was shorter in No Antibiotic group (6.2±1.4) than Oral Antibiotic group (6.7±1.1).

Conclusion: General supportive therapy is highly effective in bronchiolitis and antibiotic does not influence the course of the disease.

Bangladesh Journal of Child Health 2008; Vol. 32(1): 10-16

COMPARATIVE EFFICACY OF NEBULIZED L-ADRENALINE VERSUS SALBUTAMOL IN INFANTS WITH ACUTE BRONCHIOLITIS

AKM Amirul Morshed, Md. Ruhul Amin

Bangladesh Institute of Child Health (BICH), Dhaka

Background: Bronchiolitis is one of the most prevalent diseases of infancy for which large number of infants need hospitalization, particularly during winter period. RSV (Respiratory syncitial virus) is the principal causative pathogenic organism. Reliving symptoms are the main aim of management though none of the treatment modalities is specific. Bronchodilators like salbutamol, adrenaline, anti-cholinergic drugs, ipratropium bromide and saline nebulization have been used with varying results.

Methods: This prospective study included 52 infants (2-12 months, male:female ratio 2:1) with bronchiolitis (with 1st episode of wheeze, previously healthy baby, physical findings with cough, running nose, fever, coryza and inflation of lungs) to understand comparative efficacy of nebulized salbutamol with adrenaline in bronchiolitis. The cases were randomized into nebulized salbutamol group (n=25) and nebulized adrenaline group (n=27). After randomization three nebulization were given at the interval of 20 minutes. Outcome of therapy was evaluated by respiratory rate, MRDAI (Modified Respiratory Distress Assessment Instrument) score and O2 saturation before and after therapy.

Results: Study cases in both the groups presented with cough (100%), respiratory distress (100%), feeding difficulty (90.3%), running nose (98%) and wheeze (100%). Majority of the cases live in urban area and mostly from non-smoker family. In salbutamol group respiratory rate, MRDAI score and O2 saturation (before nebulization RR-67.5±6.1, MRDAI score-14.6±1.3, SaO2 93.9±1.6 and after nebulization RR-52.5±4.9, MRDAI score-6.4±1.7, SaO2-97.1±1.5) significantly improved after 3 nebulizations. In adrenaline group respiratory rate, MRDAI score and O2 saturation (before nebulization RR-64.9±5.9, MRDAI score-15.0±0.8, SaO2-94.1±1.4 and after nebulization RR-50.0±2.9, MRDAI score-7.7±1.0, SaO2-97.9±1.5) also significantly improved after 3 nebulizations. Improvement was more significant in adrenaline group. Heart rate in both groups were increased (salbutmol group-151.8±10.6 and in adrenaline group-160.2±10.1) but more in adrenaline group. When comparative efficacy evaluated, it was observed that nebulized adrenaline therapy was significantly superior to nebulized salbutamol therapy in reliving symptoms (p=.004).

Conclusion: The study concluded that both nebulized salbutamol and l-adrenaline are effective and nebulized l- adrenaline is significantly superior to nebulized salbutamol in infant with bronchiolitis in reliving symptom.

Mymensingh Med. J 2009; 18(Suppl): 50-55

ARI SITUATION IN BANGLADESH: AREN'T WE OBLIVIOUS OF BRONCHIOLITIS?

ARM Luthful Kabir[1], AKM Fazlur Rahman[2], Aminur Rahman[2]

[1]Institute of Child and Mother Health (ICMH), Dhaka, [2]Center for Injury Prevention and Research, Bangladesh and

Background: ARI/ pneumonia has been the leading cause of morbidity and mortality in under five children for a long time. However, there have been recent reports of outbreak of RSV bronchiolitis in the country.

Aim: To determine the causes of death and morbidity of under five children with possible explanations.

Method: Secondary analysis of Bangladesh Health and Injury Survey (BHIS) data and Review of various reports on childhood morbidity and mortality of Director General of Health Services (DGHS), Bangladesh. BHIS was conducted between January to December 2003 among 171,366 households having 820,347 populations covering 90,357 under five children including 16,193 infants. Data were collected with three sets of forms: screening form, verbal diagnosis form and verbal autopsy form. Consensus was achieved on the diagnosis after analyzing the forms by a group of pediatricians.

Results: ARI/ pneumonia was found to be leading cause of under five morbidity and mortality. Most of the pneumonia deaths occurred under two years of age and it accounted for 77.5% of deaths in the first year of life. Again, children of 2-6 months of age were found to have 2.6 times higher chance of death due to pneumonia. The peak age of bronchiolitis is 2-6 months. The proportions of pneumonia deaths of children under two years were mostly in winter and spring (64.3%), the peak season of RSV bronchiolitis.

Conclusion: The cases of bronchiolitis were misclassified as pneumonia and deaths from bronchiolitis have merged with pneumonia deaths giving rise to the bulk of ARI/pneumonia deaths.

Journal of Bangladesh Coll Phys Surg 2009; 27(2): 63-69

MANAGEMENT OF BRONCHIOLITIS WITH OR WITHOUT ANTIBIOTICS- A RANDOMIZED CONTROL TRIAL

Mazumder MJU, Hossain MM, Kabir ARML

Institute of Child and Mother Health (ICMH), Dhaka

Background: Bronchiolitis is a viral disease. Variation in the management has been documented. Hospitalized patients receive a variety of treatment modalities with uncertain efficacy. These variant modalities of treatment significantly impact the cost and adverse events associated with hospitalization. Risk of serious bacterial infection is very low in typical bronchiolitis.

Objectives: To evaluate the outcome of children with bronchiolitis with or without antibiotics.

Methodology: This was a prospective randomized control trial conducted at the Institute of Child and Mother Health (ICMH) during January to July 2005. Total 104 cases who fulfilled the inclusion criteria (runny nose followed by respiratory distress and wheeze in children under 2 years) were included. A structured questionnaire was filled up through face to face interview with the care givers. Detailed history and thorough examination were done. Supportive management was given to all children according to national guidelines. All odd number cases got antibiotics (either oral erythromycin or parenteral ampicillin) and even number cases were treated without antibiotic. Antibiotic therapy (oral and parenteral) was given to every alternate children with odd numbers. Each patient was followed up 2-3 times in 24 hours (Admitted cases thrice and OPD cases twice) for 7 days with a structured follow up sheet. Outcome variables were: Improvement of chest in-drawing, feeding difficulty, respiratory rate and return of social smile, status of oxygen saturation (SO2), disappearance of rhonchi and crepitation.

Results: There were 70 male (67.3%) and 34 female (32.7%). Mean age of the patients was 6.3 months and 92.2% were under 1 year**.** Forty three cases were treated without antibiotic, 32 cases received oral erythromycin and 29 cases received parenteral ampicillin. The course during the management was as follows in terms of symptoms and signs:

Symptoms and signs	Day 1			Day 3			Day 5		
	No ab	Oral ab	Paren ab	No ab	Oral ab	Paren ab	No ab	Oral ab	Paren ab
Chest indrawing	100%	100%	100%	62.8%	50%	62%	34%	25%	27%
Feeding difficulty	58%	42%	41%	11%	9%	10%	Nil	Nil	Nil
Social smile	30%	34%	34.5%	88%	90.6%	89.7%	All	All	All
Respiratory rate/min (mean)	62	61	62	43	43	49	—	—	—
Oxygen saturation	93%	94%	93%	97%	96%	96%	—	—	—
Wheeze	100%	100%	100%	60%	50%	55%	19%	22%	21%
Crepitation	60%	56%	62%	37%	38%	38%	7%	12%	3.4%

Conclusion: Bronchiolitis is an auto limiting and rapidly improving disease (social smile returns in 3 days, feeding improves in 3 days, chest in drawing in 5 days). Bronchiolitis children who attended hospital are mildly hypoxic. Crepitation improves earlier than wheeze. Children with bronchiolitis weather treated with or without antibiotics (oral or parenteral) recovers in the same fashion.

Recommendation: So antibiotic use should be restricted in the treatment of bronchiolitis and further study is needed with larger sample size to support these research findings.

MANAGEMENT OF BRONCHIOLITIS IN HOSPITALIZED CHILDREN

Shahin Akter, ARM Luthful Kabir

Faculty of Paediatrics, Institute of Child and Mother Health (ICMH), Matuail, Dhaka.

Background: Bronchiolitis is mostly a viral disease in infants and young children. Respiratory Syncytial Virus (RSV) is the most important cause followed by parainfluenzae, influenzae, adenovirus, rhinovirus, influenzae virus, enteroviruses, herpes simplex virus and mumps virus. Mycoplasma pneumonae is responsible in only 5% of cases. Antibiotics has little role in the management of bronchiolitis. Very few randomized control trials without antibiotic in the management of bronchiolitis have so far been conducted in the country.

Objective: To describe the outcome of bronchiolitis cases managed with supportive treatment only and managed with antibiotics in addition to supportive treatment in a hospital setting.

Methodology: One hundred and fifty infants and young children (below 2 years of age) hospitalized with clinical bronchiolitis (runny nose followed by breathing difficulty, chest in drawing and rhonchi on auscultation) were enrolled into the study. It was a single blind randomized control trial. The study was conducted at the Institute of Child and Mother Health (ICMH), Dhaka. Total 150 children were randomized into three groups: (1) Parenteral (intravenous) antibiotic group (paren AB), who were treated with IV ampicillin (2) oral antibiotic group (oral AB) who were treated with oral erythromycin and (3) No antibiotic group (No AB). All children were managed with 6 hourly salbutamol nebulisation in addition to supportive management whenever needed like IV 5% dextrose in 0.225% saline, oxygen inhalation, NG tube feeding, paracetamol suspension for fever. All the children were followed eight hourly in the morning (8:30 AM), at noon (2:30 PM) and at night (9:00 PM) for twenty three parameters. The parameters from history were: cough, runny nose, breathing difficulty, feeding difficulty, social smile, restlessness, inconsolable cry, sleeping difficulty, nasal blockade and convulsion. The parameters from physical examination were: wheeze, chest indrawing, nasal flaring, cyanosis, impairment of consciousness, temperature, respiratory rate, heart rate, liver and spleen, rhonchi and crepitation and oxygen saturation of blood by pulse oximetry. Either written or verbal consent of the parents was taken before the study. Whenever the attending doctor felt like worsening of the patient's condition with the given medication, the child was taken out of the study and given more intensive management. Parents were also at liberty to discontinue the treatment process whenever they wanted irrespective of the reasons.

Results: Out of enrolled 150 children with bronchiolitis, 139 improved and were discharged. Parents of some patients (11) discontinued the treatment and left hospital on their own after initial entry into the study. There was no death.

Analysis of individual features:

Definitions of improvement

'Marked improvement': improvement of the feature in about 90% of children

'Rapid' recovery: marked improvement occurring within 4 days

'Very rapid' recovery: marked improvement occurring at the end of day-2

'Gradual' recovery: marked improvement occurring between 4-7 days.

"Very gradual' recovery: marked improvement occurring at the end of day-7.

Characteristics of the cases of all the groups:

All the patients of three groups were similar in terms of all 13 sociodemographic factors: age, sex, weight, number of sibs, parental education, consanguinity between parents, smoking in family, family history of asthma, use of cooking material (wood), exclusive breastfeeding, birth weight and age of gestation.

Children of all three groups had normal blood count with lymphocytic predominance and had similar hyperinflation on chest x-ray.

Hematological profile: The mean value of Hb was around 10gm/dl, p 0.47 and total WBC count was around 10,000/cmm, p 0.30 in all the groups. The mean values of neutrophil and lymphocytes were around 35% and 60% respectively. The mean ESR was 27 (31) mm in 1st hour and that of CRP was 15 (12s).

Radiological profile: The most important radiological features were increased translucency (90%), hyperinflation (84%), increased interstitial marking (74%) patchy opacities (65%) consolidation (5.7%) and collapse (2.2%).

The follow up features of the cases during 7 days of hospitalization were as follows:

Runny nose: Runny nose was found in almost three quarter of children at the time of hospitalization in all the groups. The recovery from runny nose was rapid and similar in all the groups.

Cough: All the children had cough at the time of admission into hospital. The improvement was gradual and mostly similar in all the groups and required about a week for marked improvement. However, there was a tendency of early recovery in no AB group.

Breathing difficulty: All the children had breathing difficulty at the time of hospitalization. Breathing difficulty improved gradually and the differences were not universal for all children during 7 days. There was a tendency of early recovery in no AB group.

Feeding difficulty: Almost all the children had feeding difficulty at the time of hospitalization in all the groups: p 0.37. The decrement of feeding difficulty was found rapid and similar in all the groups. There was improvement of feeding difficulty in all the groups at the end of day-4.

Social smile: Very few of the children with bronchiolitis continued to show 'social smile' at the time of hospitalization in all the groups: all children 7.2% paren AB 6.3%, oral AB 11.4%, no AB 4.3%, p 0.40. There was rapid and similar improvement of social smile at the end of day-5 in all the groups.

Restlessness: Almost three quarter of the children were restless on admission in al the groups: all children 74.8% paren AB 81.3%, oral AB 72.7% and no AB 70.2%, p 0.43. The improvement was very rapid and similar in all the groups. At the end of 3 days only about 1.4% children were restless: paren AB 1.4%, oral AB 2.3%, no AB 2.1%.

Inconsolable cry: About one fifth of the children cried inconsolably on admission: all children 19.4%, paren AB 27.1%, and oral AB 11.4%, no AB 19.1%, p 0.18. The improvement was very rapid and similar in all the groups at the end of day 2.

Sleeping difficulty: About four fifth of the children had sleeping difficulty at the time of admission: all children 84.9%, paren AB 81.1%, oral AB 86.4%, no AB 87.2%, p 0.68. The improvement of sleeping problem was very rapid and similar in all the groups. The marked improvement in sleeping difficulty was at the end of day-3: all children 5.0% paren AB 6.3%, oral AB 4.5% and no AB 4.3%, p 0.89.

Nasal blockade: Nasal blockade was found in two third of the children on admission: all children 86.2%, paren AB 86.1%, oral AB 80.6% and no AB 67.6%, P 0.69. The improvement of nasal blockade was fond gradual and similar in all the groups and it required 5 days for marked improvement.

Wheeze: Wheeze (whistling sound arising from chest) was observed in about 91.4% of cases of children at time of admission in all the groups: all children 91.4% paren AB 93.8%, oral AB 93.2% and no AB 87.2%, p 0.46. The decrement of wheeze was gradual and mostly similar in all the groups. There was a tendency of early decrement in wheeze in no AB group from day-5 and it was significant on day-7. At the end of 7 days, marked improvement of wheeze was found. At 7 days wheeze persisted in case of all children 5.0%, paren AB 8.3%, oral AB 4.5% and no AB 2.1%, p 0.38.

Chest indrawing : Almost all of the children had chest indrawing at the time of hospitalization. The decrement of chest indrawing was gradual and not similar in all groups. There was a tendency of early decrement in no AB group and it was significant on day-4 and day-5 (p 0.00 and 0.01 respectively), and it was universal for all children for 7 days. There was marked improvement of chest indrawing at the end of 7 days in all the groups: all children 0.7% paren AB 2.1% p 0.32.

Nasal flaring: Almost two third of the children presented with nasal flaring at the time of admission in all the groups: all children 69%, paren AB 70.8%, oral AB 74.5% and no AB 100%, p 0.38. Nasal flaring improved very rapidly and similarly at the end of day-3 in all the groups: all children 2.9%, parental AB 4.2 and oral AB 4.5% p 0.33.

Cyanosis: Only 1.4% of children with bronchiolitis were found cyanoses at the time of hospitalization: all children 1.4% and paren AB 4.2%, p 0.15.

Fever: One tenth of the children were afebrile (temp $\leq 99^0$F): all children 15 (10.8%), paren AB 4(8.3%), oral AB 7 (15.9%) and no AB 4(8.5%) p 0.40. Most of the children were mildly febrile (100^0F-102^0F) in all the groups: all children 124 (89.2%), paren AB 44 (91.7%), oral AB 37(84.1%) and no AB 43 (91.5%), p 0.47.

Tachypnea: Almost all the children had tachypnea at the time of hospitalization: all children 135 (92.1%), paten AB 46 (95.8%), oral AB 43 (97.7%), no AB 46(97.9%), p 0.80. The decrement of fast breathing was gradual and similar in all the groups. It required 7 days for marked improvement in all the groups: all children 4(2.9%), paren AB 1(2.1%), oral AB 2(4.5%) and no AB 1(2.1%), p 0.73.

Tachycardia: Most of the children had tachycardia (HR>120/min) at the time of hospitalization in all the groups: all children 87.8%, paren AB 85.4%, oral AB 88.6%, no Ab 89.4%, p 0.82. However, the difference of decrement was not universal for all children during 7 days of hospitalization. It took 7 days for marked improvement in

fast breathing in all the groups: all children 2.2% paren AB 2.1%, oral AB 4.5% p0.33.

Palpable liver: At the time of hospitalization, liver was palpable in almost all of the cases, all children 97.8%, p 0.83.

Palpable spleen: The spleen was palpable in about one third of children: all children 38.8%, paren AB 41.7%, oral AB 36.4% and no AB 38.3% cases, p 0.87.

Rhonchi: Almost 100% children had rhonchi at the time of hospitalization. The decrement of rhonchi was gradual but not similar in all the groups. However, the difference was not universal for all children during 7 days of hospitalization. It took full 7 days for marked improvement in most of the groups. In all children 7.2%, paren AB 8.3%, oral AB 11.4% and no AB 2.1% cases, p 0.22.

Crepitation: Most of the children had crepitation at the time of hospitalization in all the groups: all children 87.8%, paren AB 93.8%, oral AB 77.3% and no AB 91.5%, p 0.04. The decrement of crepitation was gradual but not similar in all the groups. There was a tendency of early decrement of crepitation in no AB group on day-5 (2.1%). It took full 7 days for marked improvement in crepitation in all the groups. At 7 days crepitation persisted in case of all children 5.8%, paren AB 8.3%, oral AB 6.8% and no AB 2.1%, p 0.40.

Hypoxia: Almost on fifth of children had significant hypoxia SaO2 (<90%) at the time of admission: all children 19.4%, paren AB 20.8%, oral AB 11.4%, no AB 25.5%, p 0.21. The improvement of hypoxia was very rapid and similar in all the groups. At the day-2 morning, about 2.2% children were hypoxic. At day-2 hypoxia was found in case of all children 2.2%, paren AB no hypoxia, oral AB 4.5% and no AB 2.1%, p 0.87.

Length of stay (LOS) in hospital: The mean duration of hospitalization showed that children of no AB group stayed for significantly lower periods (3.49 days) in comparison to other groups like paren AB (4.42 days) and oral AB (4.23 days), p 0.02.

Conclusion: The recovery of bronchiolitis managed with supportive therapy only, was found similar to those treated with supportive therapy and antibiotics (either oral or parenteral). The recovery was rapid and similar in 'non chesty' features like runny nose, feeding difficulty, social smile, restlessness, inconsolable cry, sleeping difficulty and nasal flaring. The recovery was gradual in most of the 'chesty features' like cough, breathing difficulty, wheezing, chest indrawing, tachypnea, tachycardia, rhonchi and crepitation. There was a tendency of significant recovery in no AB group in case of 'chesty features' of cough, features of cough, breathing difficulty, wheeze, chest indrawing, tachycardia, rhonchi and crepitation. The mean duration of hospitalization was significantly less in case of no antibiotic group.

Recommendation: Children hospitalized with bronchiolitis, should be treated with supportive treatment only without any antibiotic.

Acta Paediatrica 2009; 98(10): 1593-1599

MANAGEMENT OF BRONCHIOLITIS WITHOUT ANTIBIOTICS: A MULTICENTRE RANDOMIZED CONTROL TRIAL IN BANGLADESH

ARML Kabir[1], AH Mollah[2], KS Anwar[3], AKMF Rahman[4], R Amin[5], ME Rahman[6]

[1]Department of Paediatrics, Institute of Child and Mother Health (ICMH), Matuail, Dhaka, Bangladesh, [2]Department of Paediatrics, Dhaka Medical College, Dhaka, Bangladesh, [3]Institute of Public Health, Dhaka, Bangladesh, [4]Centre for Injury Prevention & Research, Bangladesh (CIRPB), New DOHS, Mohakhali, Dhaka, Bangladesh, [5]Department of Paediatrics, Dhaka Shishu Hospital & Bangladesh Institute of Child Health, Dhaka, Bangladesh, [6]Department of Paediatrics, Sylhet MAG Osmani Medical College, Sylhet, Bangladesh

Correspondence: Professor ARM Luthful Kabir, Institute of Child and Mother Health (ICMH), Dhaka 1362, Bangladesh. Tel: +880 1711185409, Email: edrafed@gmail.com

Abstract:

Objective: To ascertain that antibiotics have no role in the management of bronchiolitis.

Design: Multicentre randomized control trial (RCT).

Setting: Five purposively selected teaching hospitals in Bangladesh.

Patient: Children under 24 months old with bronchiolitis.

Interventions: Children were randomized into three groups of therapeutic interventions: parenteral ampicillin (P-Ab), oral erythromycin (O-Ab) and no antibiotic (N-Ab) in adjunct to supportive measures.

Main outcome measures: Clinical improvement was assessed using 18 symptoms / signs which were graded on a two-point recovery scale of 'rapid' and 'gradual', indicating improvement within 'four days' and 'beyond four days', respectively.

Results: Each intervention group consisted of 98 ± 1 children having comparable clinico-epidemiological characteristics at the baseline. The trial revealed that most chesty features (features appearing to arise from chest, i.e. cough, breathing difficulty, wheeze, chest indrawing, tachypnoea, tachycardia, rhonchi and crepitation) demonstrated a gradual recovery, beyond 4th admission day and, not differing among the three intervention groups ($p > 0.23$, $p < 0.62$, $p = 0.54$, $p < 0.27$, $p = 0.75$, $p = 0.76$, $p = 0.81$, $p > 0.98$, respectively). Most non-chesty features (features appearing to arise away from chest, i.e. feeding / sleeping difficulties, social smile, restlessness, inconsolable crying, nasal flaring, fever and hypoxaemia) demonstrated a rapid recovery, within 4 days, remaining comparable among the three intervention groups ($p < 0.07$, $p = 0.65$, $p = 0.24$, $p < 0.61$, $p = 0.22$, $p = 0.84$, $p = 0.29$ and $p = 0.96$, respectively). However, nasal symptoms (runny nose and nasal blockage) also showed no difference among groups ($p = 0.36$ and $p = 0.66$, respectively). Thus, the dynamics of clinical outcome obviates that children not receiving antibiotics had similar clinical outcome than those who did.

Conclusion: In hospital settings, managing bronchiolitis with only supportive measures but without antibiotics remains preferable.

Keywords: Bangladesh, Bronchiolitis, Multicentre RCT, No antibiotics

Introduction

Bronchiolitis remains a major public health problem throughout the world exerting significant morbidity and mortality (1). Bronchiolitis due to Respiratory syncytial virus (RSV) remains a significant cause of respiratory disease all over the world, including South-East Asian countries like India (2) and Pakistan (3).

While proportional morbidity due to respiratory diseases among the infants remains 45% (4), epidemic of bronchiolitis was first reported from Bangladesh during 2001–2002 (5). This high rate continued to prevail over the next five years (6). In a recent study, we found that 21% of children under five years of age who attended different hospitals had bronchiolitis (7). Nearly 95% of bronchiolitis cases are of viral origin, RSV being the commonest (8,9), including our different observations of 50% (10) to 91% (11).

However, it was observed that bronchiolitis has been misdiagnosed as pneumonia in per-urban / outskirts of Dhaka city. This has resulted in a high proportion of indiscriminate use of wide-spectrum antibiotics, such as ceftriaxone, a third generation cephalosporin. Ceftriaxone is being recommended in as much as 70% cases (10), despite the fact that the vast majority of Bangladeshi people live in hard core poverty with a very low per capita gross national income (GNI) of only 480 US$ (12).

Forms of treatment for bronchiolitis range from home care management (in milder cases) (13) and oxygen therapy (14) to care of severe cases by employing measures (15) such as nebulized salbutamol, adrenaline, corticosteroids, aerosolized ribavirin, hypertonic saline (16) and critical management in paediatric intensive care unit (PICU) (13). However, antibiotics remain a common practice in treating bronchiolitis (10), despite the rare likelihood of bacterial infection (17,18). The low rate of serious bacterial complication and secondary infections precludes the use of antibiotics. Using antibiotics increases the treatment cost and facilitates bacterial resistance (19).

Taking into account the previously stated facts/statistics and the observation that only one randomized control trial (as a standard research) has been conducted so far since 1966 (20) as reported in a recent review by Cochrane database (21), this therapeutic trial was conducted to confirm that antibiotics are not required in the management of clinical bronchiolitis.

Materials and Methods

Set up and organization of project/study areas

This year-long randomized control trial (RCT) was conducted in five purposively selected teaching hospitals / medical college hospitals (MCH) which were homogenic (in terms of service delivery and medical education) selected from three diverse regions / districts which were heterogenic (in terms of socio-economic norms & health care seeking patterns).

Sampling frame

Total sample size

The sample size was estimated to be 327 following the Statcalc of EPInfo software version 6 [Center for Disease Control and Prevention (CDC), Atlanta, GA, USA]. However, we could analyze 295 children finally.

Inclusion criteria

Any child under two years of age, both male and female, who were hospitalized due to preceding or existing runny nose, cough, breathing difficulty, chest indrawing and rhonchi on auscultation (13,21) .

Exclusion criteria

To avoid probable confounding factors which might affect the outcome, children with atopic conditions, congenital heart disease, possible immuno-deficiency, chronic lung problem, associated infection and receiving antibiotics previously were excluded.

Randomization of children for therapeutic intervention

Following random table, 295 children were allocated into three therapeutic intervention groups receiving:

(i) parenteral ampicillin at 50 mg/kg/dose 6 hourly I.V. (P-Ab)

(ii) oral erythromycin at 10 mg/kg/dose 6 hourly (O-Ab) considering Mycoplasma pneumoniae (8) and

(iii) no antibiotics (N-Ab).

Supportive therapy constituted following Bangladeshi national guidelines (22) with 6 hourly nebulized salbutamol at 0.15 mg/kg/6–8 hourly, O2-inhalation (if SaO2 < 90%), maintenance of nutrition with 10% I.V. dextrose in 0.225% saline, nasogastric tube feeding or breast feeding (as required per case), oro-pharyngeal suction SOS and paracetamol suspension (if fever persisted).

Follow up

Follow up was conducted by trained doctors with each child, every 8 h over four to seven days using a structured sheet based on nine symptoms (cough, runny nose, breathing difficulty, feeding difficulty, social smile, restlessness, inconsolable cry, sleeping difficulty and nasal blockade) and nine signs (wheezing, chest indrawing, nasal flaring, fever, tachypnoea (>50 breaths / min), tachycardia (>120 beats /min), rhonchi, crepitation and hypoxaemia (SaO2 < 90%) by pulse oxymeter (Nonin Medical Inc., Plymouth, MN, USA).

The antibiotic therapy was planned for 7 days and in case of early discharge, the parents were advised to complete the course at home. Clinical improvement (if recovered in >90% of each group) was assessed on a two-point recovery scale of 'rapid' and 'gradual'. These were defined by the number of days in which improvement occurred, either within four days or beyond, respectively. As the remaining three clinical features of convulsions (only 1%), cyanosis (7.5%) and impaired consciousness (5%) were observed among fewer subjects (10% in each group) and improved on the day of admission, these were beyond the scope of follow up.

Discharge criteria as per our national guideline (22) were also based on satisfactory feeding, return of social smile and no hypoxia (SaO2 > 94%) in room air. However, to comply with Geneva convention, when condition seemed precarious, children were discharged from the study and referred to near-by tertiary care institutions as all our five study hospitals lacked PICU; others were discharged on risk bonds when parents opted for.

Data management

Manually verified data ran for logical sequences were analyzed using 'SPSS⁄Win v.12.5' (SPSS Inc., Chicago, IL, USA) employing necessary statistical tools (by expert programmer- cum-data analyst). Chi-square tests were performed for larger sets of numbers, while Fisher's exact test was used for smaller sets to compare proportions including likelihood ratio, linear association and correlations analysis (Pearson's &⁄or Spearman's-rho) to examine possible association⁄relationships between >2 variables. Further, Student's t-tests and Correlation of Co-efficient ⁄ANOVA tests were also performed to compare mean values of ‡2 sets of continuous variables. A p-value of <0.05 (at 95% CI) was considered as significant.

Ethical implications

During the study, ethical considerations were taken into account at every stage. Anonymity of children and confidentiality of medical records were ensured. Written informed consent was secured from mothers or guardians, the risk⁄benefit of drawing blood or conducting X-rays or oxymetry was properly detailed to the parents, including their liberty of withdrawing child from the study at any point (approved by the Ethical Review Committee, Bangladesh Medical Research Council).

Results and Findings

Initially, 441 children with bronchiolitis were assessed for eligibility. Finally, 327 children were recruited for the study based on fulfilling of the inclusion criteria.

Baseline selected clinico-epidemiological parameters

Out of enrolled 327 hospitalized infants and children with bronchiolitis, 295 (90%) were studied revealing a drop out rate of 10% (n = 32). Seventeen (5%) children were referred to tertiary care having PICU and data of 15 (4.5%) were deleted from database as their parents either withdrew their children from the study or left respective hospitals on risk bonds.

Each of three intervention groups (P-Ab, O-Ab and NAb) comprising 98 ± 1 children had a comparable baseline characteristics of age, gender and haematological and radiological features (Table 1). The cases were also similar in terms of severity, particularly feeding difficulty, nasal flaring, tachypnea and hypoxaemia (Table 2).

Dynamics of improvement in clinical symptoms and signs

More than 90% of all 295 children having symptoms and signs of clinical bronchiolitis: cough, runny nose, breathing difficulty, chest indrawing and rhonchi on admission, recovered within five to seven days, not differing significantly among intervention groups ($p > 0.23$, $p = 0.36$, $p < 0.62$, $p < 0.27$, and $p = 0.81$, respectively). On the other hand, 218 (74%) with feeding difficulty, 146 (50%) with restlessness, 103 (35%) with inconsolable crying, 186 (63%) with sleeping difficulty and 216 (73%) with no social smile recovered within three days on an average, which also did not differ among groups ($p < 0.07$, $p < 0.61$, $p = 0.22$, $p = 0.65$ and $p = 0.24$, respectively) (Table 3). Recovery of nasal blockage (recovered 5 days) also did not differ among groups ($p = 0.66$).

Moreover, 87% children (on an average) who displayed signs such as wheeze (n = 272, 92%), tachypnoea (n = 265, 90%), tachycardia (n = 260, 88%) and crepitation (n = 233,

79%) recovered within about seven days on average, which did not differ significantly among groups as well (p = 0.54, p = 0.75, p = 0.76 and p = 0.98, respectively). Contrarily, 54% children with nasal flaring (n = 160) and 27% with hypoxia (n = 80) on admission recovered within three days only, revealing a comparable statistics among groups (p = 0.84 and p = 0.29, respectively) (Table 4). Seventy-five percent of cases had no fever, with low grade fever documented in only 25% cases, which showed improvement in two days time. The recovery rate did not differ among groups (p = 0.96) (Table 4).

Rapid or gradual improvement in clinical parameters

Thus, cumulative findings of Tables 3 and 4 on clinical improvement revealed that all chesty features, such as cough, breathing difficulty, wheeze, chest indrawing, tachypnoea, tachycardia, ronchi and crepitation, demonstrated a gradual recovery after the 4th admission day. This finding did not differ among three intervention groups (p > 0.23, p < 0.62, p = 0.54, p < 0.27, p = 0.75, p = 0.76, p = 0.81 and p = 0.98, respectively). Contrary to chesty, most nonchesty features such as feeding and sleeping difficulties, no social smile, restlessness, inconsolable crying, nasal flaring, hypoxaemia and fever demonstrated rapid recovery, i.e. within four days, which also remained comparable among groups (p < 0.07, p = 0.65, p = 0.24, p < 0.61, p = 0.22, p = 0.84, p = 0.29 and p = 0.96, respectively). However, non-chesty features of nasal origin such as runny nose and nasal blockage improved gradually, after four days, and also showed no difference among groups (p = 0.36 and p = 0.66, respectively).

Table 1

Baseline characteristics of selected clinico-epidemiological parameters

Clinico-epidemiological parameters studied on admission to compare (n = 295, 100%)		Children from 3 intervention groups (n = 295,100%)			p-value
		P-Ab (99)	O-Ab (99	N-Ab (97)	
Age (in months)	£3 (n = 106, 35.9%)	38	36	32	0.66
(Proportional gps	4–6 (n = 105, 35.5%)	33	39	33	
	7–12 (n = 63, 21.4%)	23	17	23	
	13–18 (n = 16, 5.4%)	04	04	08	
	19–24 (n = 5, 1.7%)	01	03	01	
Gender	Male 214 (72.5%)	2.96:1	3.30:1	1.93:1	0.20
	Female 81 (27.4%)				
	Male female ratio = 2.64:1				
Haematological	Hb (g/dL) mean (9.85 ± 5.26)	10.44 ± 9.01	9.61 ± 1.35	9.49 ± 1.21	0.44
profiles	WBC (cmm) mean (10 717 ± 5181)	11102 ± 5747	10889 ± 6474	10 126 ± 2127	<0.42
	Polymorphs (44.4 ± 16.90)	44.9 ± 16.7	45.32 ± 16.8	42.76 ± 17.40	0.56
	Lymphocytes (50.7 ± 16.8)	50.20 ± 16.24	49.9 ± 16.74	52.11 ± 17.54	>0.70
Radiological	Increased translucency: 79.8%	81.7%	80.5%	77.4%	0.67
features	Hyperinflation : 75.8%	72.7%	78.5%	76%	>0.55
	Increased interstitial marking: 60.5%	56.5%	62.6%	62.4%	>0.51
	Streaky densities: 59.9%	61.7%	57.4%	60.4%	<0.77

Table 2
Severity features of bronchiolitis cases

Clinical features	P-Ab (99)	O-Ab (99)	N-Ab (97)	p-value
Feeding difficulty (218, 74%)	73.7%	73.7%	74.2%	0.99
Nasal flaring (160, 54%)	50.0%	55.6%	57.7%	0.54
*Tachypnoea (265, 90%)	89.9%	87.9%	91.8%	0.67
**Hypoxaemia (80, 27%)	24.2%	28.3%	28.9%	0.76

*Tachypnoea, respiratory rate > 50 / min; ** hypoxaemia, SaO2 < 90%

The mean length of stay (LOS) in hospitals was 4.14 ± 1.79 days. However, children belonging to N-Ab group stayed for significantly less days (3.7 ± 1.5) than their counterparts of P-Ab (4.3 ± 1.9) or O-Ab (4.4 ± 1.9) did (p < 0.001) (Table 3).

Table 3
Comparison in the outcome of clinical bronchiolitis based on 9 clinical symptoms in 3 intervention groups symptoms studied

Different clinical Symptom studied	Children having clinical symptom on admission	Proportion of children (<10%) not improved on specified days Yet to recover	hospital day	P-Ab	O-Ab	N-Ab	p-value	Recovery type
Cough	n = 295, 100%	n = 22 (7.5%)	On day 7	10	9	3	>0.23	Gradual
Runny nose	n = 295, 100%	n = 09 (3.1%)	On day 5	2	5	2	0.36	Gradual
Breathing difficulty	n = 295, 100%	n = 19 (6.4%)	On day 7	8	9	2	<0.62	Gradual
Feeding difficulty	n = 218, 74%	n = 18 (6.1%)	On day 4	1	0	6 2	<0.07	Rapid
Restlessness	n = 146, 50%	n = 14 (4.7%)	On day 2	5	6	3	<0.61	Rapid
Inconsolable cry	n = 103, 35%	n = 6 (2.0%)	On day 2	1	4	1	0.22	Rapid
Sleeping difficulty	n = 186, 63%	n = 10 (3.4%)	On day 3	4	2	4	0.65	Rapid
Nasal blockade	n = 173, 59%	n = 16 (5.4%)	On day 5	6	6	4	0.66	Gradual
No social smile	n = 216 (73%)	n = 23 (7.7%)	On day 4	10	9	4	0.24	Rapid
Hospital stay Mean: 4.14 ± 1.79 days	n = 295, 100%	Discharged on complete recovery with advices		4.29 ± 1.89	4.44 ± 1.93	3.67 ± 1.45	t = 39.52, p < 0.001	

Table 4
Comparison in the clinical outcome of bronchiolitis based on 9 clinical signs in 3 intervention groups

Different clinical signs studied	Children with clinical signs on admission	Proportion of children (<10%) not improved on specified days Yet to recover	hospital day	P-Ab	O-Ab	N-Ab	p-value	Recovery type
Wheeze	n = 272, 92%	n = 21 (7.1%)	On day 7	8	9	4	0.54	Gradual
Chest indrawing	n = 295, 100%	n = 22 (7.5%)	On day 6	8	10	4	<0.27	Gradual
Nasal flaring	n = 160, 54%	n = 22 (7.5%)	On day 2	8	8	6	0.84	Rapid
Tachypnoea	n = 265, 90%	n = 19 (6.4%)	On day 6	8	7	4	0.75	Gradual
Tachycardia	n = 260, 88%	n = 17 (5.8%)	On day 7	7	8	2	0.76	Gradual
Rhonchi	n = 295, 100%	n = 25 (8.6%)	On day 7	9	1	2 4	0.81	Gradual
Crepitation	n = 233, 79%	n = 19 (6.4%)	On day 7	7	9	3	0.98	Gradual
Hypoxaemia (<90%SaO2)	n = 80, 27%	n = 14 (4.7%)	On day 2	2	6	6	0.29	Rapid
Fever (100–102°F)	n = 74, 25%	n = 15 (5.0%)	On day 2	5	6	4	0.96	Rapid

Discussion

Designing the study for RCT Our study provides strong evidence that antibiotics are not necessary for the management of bronchiolitis.

This study is a well-designed pragmatic trial, sufficiently large in its multicentre RCT approach, which covered five centres. A recovery scale in clinical improvement was graded into two logical outcomes: 'rapid' and 'gradual' scales.

Thus, data from this RCT generated ample valuable information which makes one confident that antibiotics are not required in the management of bronchiolitis as the sample size was adequate (n = 295), 98 ± 1 cases in each study group, in particular. Moreover, the five of our study places, though selected purposively, had heterogenic characteristics making it epidemiologically sound and statistically accurate.

Furthermore, instead of studying only two groups, comprising either administered antibiotics or not, in addition to supportive measures, we added a third group by splitting antibiotic group into 'oral' and 'parenteral'. This was carried out to ensure that as many influencing factors were addressed as possible. Additionally, the follow up conducted to document the clinical improvement for a week (or less in case of subjects who improved earlier), involving 8 hourly clinical checkup and using as much as 18 symptoms/signs, signifies added strength to this study.

As there are no large-scale studies in the existing literature evaluating the use of antibiotics, they are considered useless for acute bronchiolitis. However, there is still a substantial misuse of antibiotic prescriptions in certain populations.

The few small-scale studies, which demonstrate that antibiotics are not necessary in the management of bronchiolitis, feature some limitations. It is worth mentioning four studies. The first study was conducted four decades ago by Field et al. (20), a two-armed trial with ampicillin and placebo in one hospital with 44 children to assess the progress using eight clinical features (pulse rate, temperature, respiratory rate, use of accessory muscles of respiration, expiratory wheeze, adventitious sounds and cyanosis).

Friis B (23) conducted a study 26 years ago, with 136 children between 1 month and 6 years of age as participants. Majumder et al. (24) recently conducted another study involving 104 children. While the study was conducted in one hospital, it was done across three groups: one received ampicillin, the other erythromycin and one group received no antibiotics. The most recent study was conducted on infants and young children with RSV lower respiratory tract disease. The study revealed that the duration of hospitalization did not differ, regardless of whether the patients were treated with azithromycin or a placebo (25).

However, a recent study, a double-blinded, placebo-controlled, randomized trial, demonstrated evidence that clarithromycin had significant improvements on clinical outcome and laboratory findings of RSV bronchiolitis. This, however, may have been due to anti-inflammatory effect of the antibiotic. This study nevertheless suffered from the following limitations: the sample size was too small (only 21 infants) and it was conducted in only one hospital (26).

Data generated from this study may not be sufficient enough to conclude that antibiotics have a role in treating clinical bronchiolitis.

Antibiotics are usually prescribed in RSV bronchiolitis cases when there is: (a) a suspected secondary bacterial infection, (b) an intention to achieve anti-inflammatory or immuno-modulatory effect and (c) an intention to prevent serious bacterial infection. It has been demonstrated that RSV effect on ciliated respiratory epithelia enhances susceptibility to secondary infections. However, the risk of secondary infections in infants and children with RSV bronchiolitis is remarkably low (18). If the intention is to reduce the inflammatory process, there would be no place for ampicillin, as there is no evidence that penicillin derivatives or ampicillin have immuno-modulatory properties.

The diagnosis of bronchiolitis is most often made on clinical grounds and the criteria may vary: very simply, the first attack of wheezing in a previously healthy child of less than two years of age (10) or for a diverse criteria with coryzal symptoms followed by rapid onset of wheeze, fever, tachypnoea, chest retractions, crepitation, ronchi with radiographical evidence of chest-hyperinflation (27). However, we adopted a midline as the diagnostic criteria for bronchiolitis (runny nose followed by breathing difficulty, chest indrawing and rhonchi (on auscultation) in less than two-year-old children). Moreover, haematological (10) and radiological profiles of our study cases remained consistent with others' findings (28).

Clinical management of bronchiolitis: is antibacterial therapy necessary?

The answer is no. As with the previously listed studies, findings from our research provides evidence that antibiotics do not influence the natural course of bronchiolitis in terms of recovery (20,23,25). Furthermore, children who did not receive antibiotics had a significantly shorter hospital stay ($p < 0.001$). The reason might be at least twofold: firstly, the poor parents tend to continue antibiotic course like other parents having fascination with antibiotics (29) for their children even if their children fulfilled the discharge criteria. Secondly, the parents did not want to keep their children in hospital any more when their child's condition improved but not receiving any antibiotics. There remains scope to change the existing guideline for the management of bronchiolitis (21) in the light of the findings of this study. As a result, the universal practice of prescribing antibiotics in bronchiolitis may be significantly reduced as observed in other country (30).

Evidence-based findings on the dynamics of clinical improvement

The research revealed the following details on the recovery rates of the children:

i) chesty features: had gradual recoveries, not differing among three intervention groups and,

ii) most non-chesty features: resolved rapidly and were comparable among three intervention groups, except for runny nose and nasal blockage. Moreover, children belonging to N-Ab group stayed for fewer days in hospital than their counterparts of P-Ab or O-Ab group.

Knowing the rate of recovery of different clinical features in bronchiolitis bears several important implications. For example, rapid return of social smile, being able to take food and not requiring oxygen any longer provide opportunity of a more speedy turnover in respective hospitals, particularly in the given situation of Bangladesh where persons per hospital bed remain as much as 2732 (9). There is also scope to counsel parents that chesty features, such as cough or wheeze, are likely to persist for a longer period in spite of improvement of other symptoms and a longer hospital stay is not necessary.

Limitations of the study include: (i) not assessing the RSV status, (ii) not being a double-blind study (due to fund constraints) and (iii) parental desire of not keeping their children for more than seven days in the hospital as they improved sooner.

Conclusion

Managing acute bronchiolitis without antibiotics in adjunct to supportive measures remains preferable as clinical outcomes (recovery rates) were similar to those of cases receiving antibiotics. Moreover, the recovery was 'gradual' in cases of chesty features in contrast to 'rapid' recovery of most of the non-chesty features.

What is already known on this topic?

Role of antibiotics in bronchiolitis management was still indecisive, four studies supported the fact that there was no role of antibiotics in management of bronchiolitis and one study demonstrated the role of clarithromycin. All these studies were conducted in a single hospital with small sample size (21–136) using two-armed study design.

What this study adds?

Management of bronchiolitis among younger children is possible using only supportive measures in hospital setting even in a low-income country context.

This was a multicentre study with large sample size (327), having three arms, comparing parenteral, oral and no antibiotics.

Outcome measures included 18 clinical features and length of hospital stay. The dynamics of improvement of 'chesty' and 'non-chesty' clinical features were also measured.

Acknowledgements

We thank the Bangladesh Medical Research Council for funding this project (through a grant from the World Bank), the directors, principals, head of departments/units of respective institutes and medical colleges for allowing us to conduct this study.

Our special tributes go to those children / parents who withstood the trouble to participate in the study and allowed our research team for required non / invasive clinical methods from time to time, without whom this attempt would have been futile.

We remain thankful to Ms. Stephanie Ryne (a native English speaker from Australia), a communication specialist from Australian youth ambassador, currently working for CIRPB, for editing the manuscript, particularly the English language, whenever necessary.

References

1. Jeng MJ, Lemen RJ. Respiratory syncytial virus bronchiolitis. Am Fam Physician 1997; 55: 1136–46, 1149–50.
2. Cherian T, Simoes EA, Steinhoff MC, Chitra K, John M, Raghupathy P, et al. Bronchiolitis in tropical south India. Am J Dis Child 1990; 144: 1026–30.
3. Tariq WU, Waqar T, Ali S, Ghani E. Winter peak of respiratory syncytial virus in Islamabad. Trop Doct 2005; 35: 28–9.
4. Kabir AL, Rahman F, Rahman A, Safinaz S, Linnan M. Respiratory disease the leading cause of mortality and morbidity among under five children in Bangladesh: still a far cry for optimal management even after a decade of ARI control Program. Proceedings of the America Thoracic Society. Vol-2, Abstract Issue. San Diego, California, USA: American Thoracic Soc International Conference, May 20–25, 2005, A-470
5. Kabir ML. Bronchiolitis: was there an epidemic? Bangladesh J Child Health 2002; 26: 1–2.
6. Kabir ML, Rahman F, Rahman A. ARI situation in the country: aren't we oblivious of bronchiolitis. Mymensingh Med J 2009; 18: 50–5.
7. Kabir ML, Mollah AH, Amin R, Rasul H, Abser N, Zahid A. Magnitude of respiratory disorders in under five children attending different hospitals of Bangladesh. Dhaka: Bangladesh Medical Research Council (BMRC) Project, 2007–2008 (Final report).
8. Welliver R, Cherry JD. Bronchiolitis and infectious asthma. In: Feigin RD, Cherry JD, editors. Text book of paediatric infectious diseases. Philadelphia: WB Saunders, 1987: 278–87.
9. Mansbach JM, McAdam AJ, Clark S, Hain PD, Flood RG, Acholonu U, et al. Prospective multicentre study of the viral etiology of bronchiolitis in the emergency department. Acad Emerg Med 2008; 15: 111–8.
10. Kabir ML, Haq N, Amin R, Hossain A, Khatoon S, Shahin A, et al. Evaluation of hospitalized infants & young children with bronchiolitis – a multi center study. Mymensingh Med J 2003; 12: 128–36.
11. Huq F, Rahman M, Nahar N, Alam A, Haque M, Sack DA, et al. Acute lower respiratory tract infection due to virus among hospitalized children in Dhaka, Bangladesh. Rev Infect Dis 1990; 8 Supp 12: S982-7.
12. United Nations Children's Fund (UNICEF). State of World's Children 2008. Dhaka: United Nations Children's Fund (UNICEF), December 2007.
13. Fitzgerald DA, Kilham HA. Bronchiolitis: assessment and evidence-based management. Med J Aust 2004; 180: 399–404.
14. Reynolds EOR, Cook CD. The treatment of bronchiolitis. J Paediatr 1963; 63: 1205–7.
15. King VJ, Viswanath M, Bordley WC, Jackman AM, Sutton SF, Lohr KN, et al. Pharmacologic treatment of Bronchiolitis in infants and children: a systematic review. Arch Pediatr Adolesc Med 2004; 158: 111–2.

16. Zhang L, Mendoza-Sassi RA, Waiwright C, Klassen TP. Nebulized hypertonic saline solution for acute bronchiolitis in infants. Cochrane Database Syst Rev 2008; CD006458.

17. Kuppermann N, Bank DE, Walton EA, Senac MO Jr, McCaslin I. Risk for bacteremia and urinary tract infections in young febrile children with bronchiolitis. Arch Pediatr Adolesc Med 1997; 151: 1207–14.

18. Bloomfield P, Dalton D, Karieka A, Kesson A, Duncan G, Isaacs D. Bacteraemia and antibiotic use in respiratory syncytial virus infections. Arch Dis Child 2004; 89: 363–7.

19. Spach DH, Black D. Antibiotic resistance in community acquired respiratory tract infections: current issues. Ann Allergy Asthma Immunol 1998; 81: 293–302.

20. Field C, Connolly J, Murtagh G, Slattery C, Turkington E. Antibiotic treatment of epidemic bronchiolitis – a double blind trial. Br Med J 1966; 1: 83–5.

21. Spurling GKP, Fonseka K, Doust J, Mar Del C. Antibiotics for bronchiolitis in children. Cochrane Database Syst Rev 2007; CD005189.

22. Hassan R, Hossain A, Mahmud AM, Kabir ML, Amin RM, Rahman MM, et al. National guidelines: asthma, bronchiolitis, COPD. Bangladesh: Asthma Association, 2005.

23. Friis B, Andersen P, Brenoe E, Hornsleth A, Jensen A, Knudsen FU, et al. Antibiotic treatment of pneumonia and bronchiolitis. A prospective randomized study. Arch Dis Child 1984; 59: 1038–45.

24. Majumder JU, Hossain MM, Kabir ML. Management of bronchiolitis with or without antibiotics – a randomized controlled trial. Bangladesh J Coll Physicians Surg 2009; 27: 63–9.

25. Kneyber MC, van Woensel JB, Uijtendaal E, Uiterwall CS, Kimpen JL; Dutch Antibiotics in RSV Trial (DART) Research Group. Antibiotics does not improve disease course in hospitalized infants with respiratory syncytial virus (RSV) lower respiratory tract disease: a randomized control trial. Pediatr Pulmonol 2008; 43: 142–9.

26. Tahan F, Ozean A, Koc N. Clarithromycin in the treatment of RSV bronchiolitis: a double-blind randomized control trial. Eur Respir J 2007; 29: 91–7.

27. Wohl MEB, Chemic V. State of the art: bronchiolitis. Am Rev Respir Dis 1978; 118: 59–81.

28. Ahmed F, Kabir AR, Haq N. Radiological evaluation of 162 cases of bronchiolitis. Bangladesh J Child Health 2003; 27: 6–9.

29. Zhang L, Mendoza R, Costa MM, Ottoni EJ, Bertaco AS, Santos JC, et al. Antibiotic use in community-based pediatric outpatients in southern region of Brazil. J Trop Pediatr 2005; 51: 304–9.

30. Barben J, Kuehni CE, Trachsel D, Hammer J, Swiss Paediatric Respiratory Research Group. Management of acute bronchiolitis: can evidence based guidelines alter clinical practice? Thorax 2008; 63: 1103–9.

EFFICACY OF NEBULIZED IPRATROPIUM BROMIDE VERSUS SALBUTAMOL IN INFANTS WITH ACUTE BRONCHIOLITIS

Md. Balayat Hossain Dhali, Moinuddin Ahmed

MD (Paediatrics) Third Part Student, Department of Paediatrics, Chittagong Medical College, Chittagong

Background: Bronchiolitis is an acute inflammatory respiratory illness of children less than 2 years of age. It is the leading cause of lower respiratory tract infection in infants. In 50% cases; it is due to respiratory syncytial virus (RSV). A wide range of drugs are commonly used to treat bronchiolitis, but evidence of their effectiveness is limited. Classically adequate hydration, supplementary oxygen, bronchodilators and corticosteroids may be used in the treatment of acute bronchiolitis.

Objective: In this cross sectional comparative study, our objectives were to compare the efficacy of nebulized ipratropium bromide and nebulized salbutamoi in the treatment of patients with bronchiolitis.

Methodology: We enrolled 100 hospitalized infants aged of 2 to 12 months from the pediatric in-patient department of CMCH during the period of January 2009 to July 2009. They were suffering from acute bronchiolitis with moderate to severe type (categorized by MRDAI score) were we tried to evaluate the efficacy of above mentioned bronchodilators. The cases were assigned according to ID number at the time of selection of the cases by inclusion and exclusion criteria i.e. odd ID numbers were in group-A (salbutamol group) and even ID numbers were in group-B (ipratropium bromide group). Clinical severity was scored by MRDAI (Modified Respiratory Distress Assessment Instrument) score system on admission and 12 hours intervals after the start of nebulization. The MRDAI score evaluated five items; respiratory rate, presence of wheezing, presence of recession, presence of nasal flaring and general appearance. Data was collected in a questionnaire and was analyzed by using SPSS v. 15.0 for windows.

Result: Both groups showed a significant improvement following 48 hours of treatment (mean MRDAI score reduction after 48 hrs of treatment was 4.64 ±1.17 in group-A and 5.06 ± 0.80 in group-B) [p>0.05]. No significant difference was observed in clinical improvement (MRDAI score) between two groups after 12, 24, 36 and 48 hours of treatment and also at discharge (p>0.` 05 Except tremor seen in 4 patients (17, 39, 67 and 83) of group-A as an adverse effect of salbutamol, no other adverse effect was noted in both groups. The tremor was resolved spontaneously within few minutes. The mean length of hospital stay (LOS) a was not significantly different between two groups (mean LOS in hospital in group-A and group-B were 3.60 ±0.76 and 3.64 ± 0.63 respectively) [p>0.05).

Conclusion: We conclude from our work on infants with acute bronchiolitis that both salbutamol and ipratropium bromide are useful in relieving symptoms of an infant with acute bronchiolitis and there is no difference between the clinical scores (MRDAI score) and LOS in hospital of infants receiving ipratropium bromide or salbutamol. Because of the possible side effects of salbutamol, ipratropium bromide may be preferred as bronchodilator in infants with acute bronchiolitis.

Mymensingh Med J 2009; 18(2): 208-214

COMPARATIVE EFFICACY OF COMBINED NEBULIZED SALBUTAMOL WITH IPRATROPIUM BROMIDE AND NEBULIZED ADRENALINE TO TREAT CHILDREN WITH ACUTE BRONCHIOLITIS

Kadir MA[1], Mollah AH[2], Basak R[3], Choudhury AM[4], Ahmed S[5]

Dhaka Medical College Hospital, Dhaka

Background: As the efficacy of combined nebulized salbutamol & ipratropium bromide as well as L-adrenaline to treat acute bronchiolitis is not well studied among the Bangladeshi infants.

Objective: This study was carried out to see their efficacy in acute bronchiolitis and to compare their effectiveness.

Methodology: This randomized clinical trial was done among 60 children aged less than 02 years, admitted in the department of Pediatrics, Dhaka Medical College Hospital, during January through December 2005 with acute bronchiolitis. After a quick initial assessment, nebulization were done twice at 6 hours interval with the mentioned drugs, group wise (one group with salbutamol plus ipratropium bromide and other group with L-adrenaline alone) and the outcomes were assessed after 30 minutes of each nebulization in respect to oxygen saturation and clinical modified respiratory distress assessment instrument (MRDAI) scores. The results were analyzed by using SPSS version 10.0 and at a p value of <0.05 the test was considered significant.

Result: The clinical characteristics were similat in both the groups. After 02 doses of nebulizations by the studied drugs, a significant improvement in respect to oxygen saturation and MRDAI score were noted among the children in both the groups, compared to their baseline status ($p=0.000$) However, L-adrenaline showed more efficacy (MRDAI, $p=0.021$; SaO2, $p=0.034$) than combined Salbutamol & Ipratropium bromide.

Conclusion: Both L-adrenaline and combined salbutamol & ipratropium bromide were found effective in acute bronchiolitis but L-adrenaline was found more effective. A large multi centre clinical trial is recommended.

PREVALENCE OF VIRAL BRONCHIOLITIS IN WHO CLASSIFIED SEVERE PNEUMONIA

ARM Luthful Kabir[1], Ryuichi Uchida[2], Selim Ahmed[1] Bikash Sikder[1], Shafi Uddin Ahmed[1], Soofia Khatun[1], A Salam[1]

[1]Institute of Child and Mother Health (ICMH), Dhaka, Bangladesh, [2]Thailand-Japan Research Collaboration Center on Emerging and Re-emerging Infections (RCC-ERI), Osaka University, Japan.

Background : Pneumonia is the leading cause of death of children globally as well as in Bangladesh.

Although WHO criteria define pneumonia/ALRI by symptoms and signs of the patients, radiological and virological findings of WHO severe pneumonia were not well studied. In addition, increasing cases of bronchiolitis which meet the criteria of WHO severe pneumonia are reported in Bangladesh.

Materials and Methods: From November 2007 to March 2008, Children less than 2 years who diagnosed severe pneumonia by WHO criteria (fast breathing and chest in-drawing) in ICMH were all enrolled. Chest X-ray were examined and reviewed by a radiologist, a pulumonologist, and two pediatricians. Respiratory syncitial virus (RSV), Influenza A and B virus, and Adenovirus were detected by rapid test kit using immuno-chromatography (Alfressa, Japan). Bronchiolitis was defined clinically by runny nose, chough, chest in-drawing, rhonchi, and radiologically having any of chest X-ray findings compatible with bronchiolitis (hyperinflation, interstitial markings, and streaky density).

Results : 100 patients with severe pneumonia were enrolled during this period, all of them were tested for viruses and 78 patients were reviewed for their Chest X-ray. Chest X-ray analysis revealed increased interstitial markings: 66 cases (84.6%), hyperinflation 50 cases (64.1%), and streaky density: 45 cases (57.7%) which suggest predominant virus infection, while consolidation: 4 cases (5.1%) and alveolar infiltrates: 21 cases (26.9%) which suggest predominant bacterial infection were observed. Any virus infections were detected in 65 cases (65%). RSV was predominant: 63 cases (63%), then followed by Influenza viruses A : 5 cases (5%) and Adenovirus: 1 case (1%). Among them, two cases of mixed infection of RSV and Influenza virus A and one case of that of RSV and adenovirus were observed. A total of 59 cases of bronchiolitis were diagnosed, 45 cases were any virus positive (viral bronchiolitis), which was predominant in WHO severe pneumonia ($P<0.01$)

Conclusion : Radiological and virological analysis suggested predominance of virus infection, especially viral bronchiolitis, in children with WHO severe pneumonia in Bangladesh.

EFFICACY OF HYPERTONIC (3% NaCl) SALINE SOLUTION NEBULIZATION IN CHILDREN WITH ACUTE BRONCHIOLITIS

Mohammad Abul Khayer, Manajjir Ali

Department of Pediatrics, M.A.G Osmani Medical College Hospital, Sylhet,

Background: Airway edema and mucus plugging obstruct flow in the small airways, leading to hyperinflation, atelectasis and wheezing in children with acute bronchiolitis. Nebulized hypertonic saline (3% NaCl) solution may reduce these pathological changes and decrease airway obstruction and thereby improve symptoms of bronchiolitis.

Objectives: To assess the effects of nebulized hypertonic saline (3% NaCl) solution in children with acute bronchiolitis.

Design: Randomized, double blind controlled trial. The study was conducted in the department of Pediateics, M.A.G Osmani Medical College Hospital, Sylhet from January 2009 to December 2009.

Methodology: Ninety hospitalized children (age: mean ± SD: 11.1±12.3 months) with acute bronchiolitis received inhalation of 3% NaCl solution (group-I), and 91 children with acute bronchiolitis received inhalation of salbutamol solution with normal saline (group-II). This therapy was repeated three times on every hospitalization day and recording of clinical variables were taken two times daily for 3 days.

Results: There was improvement in both groups after inhalation of either hypertonic saline solution (Group-I) or salbutamol solution with normal saline (Group-II) on the first, second and third day after hospital admission. Head nodding and nasal flaring and variables were not statistically significant (P>0.05). Chest indrawing, wheeze, respiratory rate and SpO2 (%) also improved in both groups but after 3 days of hospitalization, it was not statistically significant (p.0.05) in both groups. Duration of hospitalization was 3.61±1.51 days in group-I and 3.16±1.22 days in group-II and it was not statistically significant (p>0.05).

Conclusions: Both nebulized hypertonic saline (3% NaCl) solution and nebulized salbutamol solution with normal saline are found effective to relieve symptoms in case of acute bronchiolitis. Nebulized hypertonic saline solution was not found more effective than nebulized salbutamol solution with normal saline solution.

CLINICAL PROFILE AND RADIOLOGICAL EVALUATION OF BRONCHIOLITIS IN HOSPITALIZED CHILDREN

Faizul Haque Ponir

Department of Paediatrics, Sher-E-Bangla Medical College Hospital (SBMCH), Barisal, Bangladesh

Background: Bronchiolitis, causes by viruses namely RSV and others is the leading cause of lower respiratory tract infection in infant and young children. This LRTI affects children up to the age of 24 months, with younger infants often more severely affected.

Objectives: This study was done to assess the clinical profile and radiological evaluation of bronchiolitis in hospitalized children.

Methods: This cross- sectional study was carried out in the paediatric ward of SBMCH, Barisal, for a period of 6 months. A total of 100 cases of bronchiolitis in hospitalized children up to 24 months of age were enrolled in the study. Children with any congenital anomaly or unwillingness to participation in the study were taken as exclusion criteria. Immediately after admission a detailed history, physical examination was done. Chest x-ray was done in every case. Diagnosis of bronchiolitis was confirmed by the presence of typical history, clinical and radiological findings. Radiologist was kept blind about the cases. Data were collected in a preformed questionnaire.

Results: Out of 100 radiologically proven cases of bronchiolitis, 70% of affected children were male and the mean age of onset was 6.7 ± 3.4 months. Majority (42%) of the affected patients belonged to the lower middle class family from densely populated urban area. Non exclusive breast fed infants (58%) outnumbers in the causation of bronchiolitis. However most of the (79%) affected children were term babies and 98% of them were immunized age appropriately. Ragarding clinical features 100% of affected children had cough and rhonchi. Other association were runny nose (94%), respiratory distress (90%), tachypnoea (87%), crepitation (79%), wheeze (77%), fever (76%), restlessness (60%), feeding difficulty (48%), inconsolable cry and chest indrawing (40%), nasal flaring (30%) cyanosis (18%).

Regarding radiological findings four features were found to be significant, increased translucency (78%), hyperinflated lung fields (74%), streaky density (46%) and increased interstitial marking (32%).

Conclusion: Along with clinical profile, radiological features could be important parameters in the diagnosis of bronchiolitis.

COMPARATIVE EFFICACY OF NEBULIZED SALBUTAMOL ALONE VERSUS COMBINED NEBULIZED SALBUTAMOL AND IPRATROPIUM BROMIDE IN THE TREATMENT OF ACUTE BRONCHIOLITIS

Md. Abdullah, Azizul Haque

FCPS-II, Paediatrics, Mymensingh Medical College Hospital, Mymensingh, Bangladesh

Background: Bronchiolitis is one of the most common diseases of young child for which large number of infants need hospitalization. Respiratory syncitial virus is the principal causative pathogenic organism. Relieving symptoms is the main treatment.

Objectives: To compare the efficacy of nebulized salbutamol versus combined nebulized salbutamol with ipratropium in the treatment of acute bronchiolitis .

Methodology: This study included 100 patients age 2-24 months with first clinical presentation. The cases were randomized into nebulized salbutamol plus ipratropium group (n=50) and nebulized salbutamol group (n=50). Nebulization was done 8 hourly in each group.

Result: This study was done over a period of 8 months. Total hundred patients with mean age of 5.49 ± 1.43 months were included. Among them 60% patients were male and 40% were female. Most of the patients (58%) were under six months of age. Two groups were similar at socio demographic and clinical characteristics at enrollment. Cough was the most constant feature present in 100% patients. Wheeze was present in 95% of patients, difficult breathing 90%, runny nose 94%, fever 47%, of the patients were found. Among the signs, tachypnea, tachycardia, chest indrawing, rhonchi, crepitations, were the common features which were also similar in both groups, After nebulization O2 saturation, respiratory distress assessment score had significantly improved in both groups in comparison to same parameters before nebulization (p=<0.05). Heart rate was significantly increased after nebulization (p=<0.05). But when comparative efficacy was evaluated it was observed that neither of therapy was found superior to other & difference was not statistically significant (p=>0.05).

Conclusion: No extra benefit was found in adding of nebulized ipratropium with nebulized salbutamol in treatment of acute bronchiolitis.

OUTCOME OF BRONCHIOLITIS CASE MANAGEMENT WITHOUT ANTIBIOTIC – A RANDOMIZED CONTROL TRAIL IN A TERTIARY HOSPITAL

Sheikh Mujibur Rahman, Jhulan Das Sharma

Md (Pediatrics) Thesis Part, Department of Paediatrics, Chittagong Medical College, Chittagong

Background: Bronchiolitis is mostly a viral disease in infants and young children. It is a clinical diagnosis characterized by cough & respiratory distress associated with wheeze preceded by runny nose with or without fever.

Objective: Objective of the study was to compare the outcome of young children of 2 months to 2 years with bronchiolitis treated with or without antibiotics.

Methodology: It was a prospective single blind randomized control trial done in Chittagong Medical College Hospital during one year(October 2009 to September 2010) . All the children of 2 months to 2 year of age admitted with a diagnosis of clinical bronchiolitis were included in the study. The study case were randomly assigned in two groups: Group A (without antibiotic) & Group B (with antibiotic).Presenting sign and symptoms were followed thrice daily to determine the progress of the disease. Outcome was estimated by the level of improvement in the scale of rapid & gradual. A total of 100 cases of bronchiolitis were included in the study. Most (68%) of them below 6 months.

Result: Each intervention group having comparable clinico-epidemiological characteristics at the base line. The trial revealed that most chesty features(i,e. cough, breathing difficulty, wheeze, chest indrawing, tachycardia, ronchi & crepitation) demonstrated a gradual recovery beyond 4th admission day and differing among two groups (p 0.19, p 0.35, p 0.33, p 0.50, p 0.48, p 0.68, p 1.00 respectively). Most non-chesty features (i.e. feeding/ sleeping difficulty, social smile, restlessness, inconsolable cry, nasal flaring, fever and hypoxemia) demonstrated a rapid recovery within 4 days, remaining comparable among the both group (p 0.15, p 0.84, p 0.55, p*0.50, p 0.38, p 0.09, p 0.54, p 0.46 respectively). However, nasal symptoms (runny nose & nasal blockade) also showed no difference among groups p 0.25, p 1.00 respectively).

Conclusion: Thus, the dynamics of clinical outcome obviates that children not receiving antibiotics had similar clinical outcome than those who did.

ICMH Journal 2011; 2(1): 33-41

BRONCHIOLITIS: AN UPDATE

Md. Jashim Uddin Mazumder[1], ARM Luthful Kabir[2], Wahida Khanam[1], Al-Amin-Mridha[3], Nihar Ranjan Sarker[4], Md. Shahidul Haque[1], Subhasish Das[1]

[1]Assistant Professor of Paediatrics, Institute of Child and Mother Health, Matuail, Dhaka, [2]Professor of Paediatrics, Sir Salimullah Medical College, Dhaka, [3]Assistant professor of Paediatric Nephrology, Shaheed Suhrawardy Medical College and Hosital, Sher-e Bangla Nagar, Dhaka, [4]Assistant professor of Paediatrics, Shaheed Suhrawardy Medical College and Hosital, Sher-e Bangla Nagar, Dhaka

Bronchiolitis is a major public health problem throughout the world exerting significant morbidity and mortality. It is mostly a viral disease. The most important causative agent is respiratory syncytial virus (RSV). Molecular diagnostic techniques have revealed that young children with bronchiolitis are sometimes infected with more than one virus, most commonly with RSV and either human metapneumovirus (HMPV) or rhinovirus. Recently discovered parvovirus, human bocavirus, has also been linked to bronchiolitis. In community based studies, the criteria for defining bronchiolitis have included a physician's diagnosis and the first episode of wheezing in a previously healthy child of less than 2 years of age. Investigations with the exception of oximetry, are not routinely indicated in the diagnosis or in determining the severity of bronchiolitis. Bronchiolitis can be managed both at home and hospital according to the severity of illness. There is scope to counsel the parents that bronchiolitis is not pneumonia and some clinical features such as cough or wheeze likely to persist for a longer period in spite of improvement of other symptoms.

CLINICAL PROFILE AND HOSPITAL OUTCOME OF NEONATAL BRONCHIOLITIS: A STUDY OF 50 CASES

May May Hla Marma, Md. Abid Hossain Mollah

FCPS (pediatrics) Part-II, Examinee Department of pediatrics, Dhaka Medical College and Hospital, Dhaka, Bangladesh

Background: Bronchiolitis is the leading cause of lower respiratory tract infection in infants. It remains a major public health problem throughout the world exerting significant morbidity and mortality. Respiratory syncytial virus is the most common cause of bronchiolitis in infants and young children. In Bangladesh, yet no well-designed study was conducted on neonatal bronchiolitis.

Objective: To see the clinical profile and outcome of neonatal bronchiolitis.

Methods: Full term neonates ages ranging from day 0 to 30 days, who presented with either first attack of wheeze or runny nose followed by respiratory distress were admitted in the department of neonatology of Dhaka Medical College Hospital, Bangladesh institute of child health, Azimpur maternity hospital during February 2011 to February 2012 were initially enrolled in this study. Total 50 patients of bronchiolitis were selected for study. After enrollment, detailed clinical and hematological assessments were done. Nasopharyngeal aspirates from the patients were tested for RSV by RSV antigen kits (SAS™, RSB Alert, San Antonio, USA). The treatment modalities were mainly supportive and antibiotics. Every patient was followed up until discharged form the hospital and their outcome measured. All data were recorded in a pre-tested questionnaire and analysed by SPSS 19.0 software of windows.

Results: Out of total 50 neonates, Thirty two neonates (64%) were included as first attack of wheeze and eighteen neonates (36%) were runny nose followed by respiratory distress. Breathing difficulty and severe chest retraction was present in fifty (100%) cases both in first attack wheeze and in runny nose neonates and forty (80%) neonates had feeding difficulty, among them thirty (93.7%) cases in first attack wheeze and ten (55.5%) cases in runny nose followed by respiratory distress neonates, cough, history of fever, rhonchi, enlarged liver problem was found in the thirty four (68%), thirty two (64%), thirty two (64%), twenty two (48%) neonates respectively. While only 10(20%) cases have temp 100-101^{0}F. Cyanosis was present in ten (2)%) cases. Rhonchi were present in twenty (62.5%) cases in first attack wheeze and in twelve (66.6%) cases of runny nose neonates. Thirty six (72%) cases were males and fourteen (28%) were females with male to female ration of 2.58:1. In this study, neonates of 1, 13, 27 days age were occupying the highest proportion (36%). However babies of all ages are affected. Forty (80%) neonates were born at 37weeks. Thirty cases (60%) delivered by LUCS. Mean age of presentation was 15.88 ± 9.18 days and mean body weight was 3.26± 0.74 kg. Thirty five (70%) neonates were on exclusive breast feeding (71.8% were in first attack wheeze neonates), three (6%) were on formula feeding, and twelve (24%) cases were on mixed feeding. Twenty three (46%) neonates came from low income family. Six (12%) case of the families however had significant family history of atopy.

The mean value of WBC count was 10864±2830/cmm. CRP is positive in 20% cases (mean 6.4±0.5mg/l). Radiologically, more than half of the patient had increased translucency (26%), hyper inflation (26%) and increased interstitial markings (22%), chest X-ray was normal in 32% cases (most in runny nose followed by respiratory distress neonates). In first attack of wheeze neonates radiological findings were 10(31.2%), 7(21.8%), 9(28.1%) while in runny nose neonates were 3(16.6%), 3(16.6%), 2(11.1%) increased translucency, hyperinflation, increased interstitial markings respectively. All the neonates showed RSV for antigen detections was negative, The treatment modalities were mainly supportive and antibiotics. In this study, 32% of the neonates needed oxygen supplementations for 24 hours, 24% neonates for 48 hours and only 4% were given for 168 hours. Almost all the neonates improved except two neonates who were referred to neonatal intensive care unit faculties as they developed respiratory failure.

Conclusion: The study concluded that male neonates having the highest proportion and mean age of presentation was 15.88 days. Most common presentation clinical feature were breathing difficulty, chest in drawing, feeding difficulty, cough, rhonchi both in first attack of wheeze and in runny nose followed by respiratory distress neonates. Mean Duration of hospital stay was 4.40 days. None of the studied neonates had RSV positive. Out of 50 neonates, 48 neonates improved completely and 2 patients were referred to specialized centre as they developed respiratory failure.

BRONCHIOLITIS: AN OUT-BREAK IN BANGLADESH AND ITS OPTIMUM MANAGEMENT

ARM Luthful Kabir[1], Md. Abid Hossain Mollah[2]

Prof of Pediatrics, Sir Salimullah Medical College, Dhaka, Prof of Pediatrics, Dhaka Medical College, Dhaka

Venue : Shaheed Suhrawardy Medical College, Dhaka

Presently, Bangladesh is experiencing an out-break of bronchiolitis. Lot of small children are attending general physicians, pediatricians, hospital out patient department and also hospitalized in the in-patient department of Pediatrics of all hospitals with cough and respiratory distress over the last few weeks. Right now, there are 29 (30%) cases out of 98 hospitalized children with cough and respiratory distress (mostly bronchiolitis) at Sir Salimulla Medical College and Mitford Hospital, Dhaka.

Bronchiolitis is a viral self limiting respiratory disease. The children are usually below one year, particularly <6 months of age. The child can have inconsolable cry, feeding/ sleeping difficulty, restlessness, nasal flaring and increased heart rate. The child has fast breathing (>50-60 breaths/min), and wheeze/rhonchi on auscultation. Total white cell count is within normal limit (<15,000/cmm) and chest x-ray shows hyperinflation and hyperlucency i.e. large and darker lung fields in most of the cases with few streaky densities.

The diagnosis is very simple characterized by preceding runny nose followed by cough and respiratory distress (chest indrawing) and low grade fever in small children below two years of age. The supportive laboratory and radiology can help reaching the diagnosis. Management of uncomplicated severe bronchiolitis needs hospitalization, support therapy like oxygen, salbutamol/ hypertonic saline nebulization, paracetamol suspension (if febrile), and continuation of nutrition either by intravenous fluid or nasogastric tube feeding or breast feeding. Intravenous costly antibiotics (like ceftriaxone) are not necessary. Either no antibiotics or oral erythromycin can be given when antibiotics are necessary in uncomplicated cases of bronchiolitis. This has been well proved by two good studies conducted by Bangladeshi doctors and these studies have got its place in the *Cochrane data base*\ There is high chance (up to 70%) of recurrent wheeze following an attack of bronchiolitis and it is important for counseling of the parents and further management.

The Cochrane Acute Respiratory Infectious Group have recently (2011) conducted the meta analysis and systematic review on the role of antibiotics in bronchiolitis. They reviewed research activities of *last 44 years (1966-2010)* and *searched 559 research papers* and found only *five well-conducted controlled trials* suitable for analysis. Three articles were from high income countries and two from resource poor countries. Fortunately, both the papers *(Kabir ARML, Mollah A, Anwar KS, Rahman F, Amin R, Rahman ME, Management of bronchiolitis without antibiotics: a multi-centre randomized control trial in Bangladesh. Acta Paediatrica 2009; 98 (10): 1593-1599;* and Majumder JU, Kabir ARML. Management of bronchiolitis with or without antibiotics-

a randomized control trial J of Bangladesh College of Physicins and Surgeons 2009; 27(2) : 63-69) of low income countries are from Bangladesh. Bangladesh Pediatric Pulmonology Forum (BPPF) members conducted the studies and published in these peer reviewed journals. All the pediatricians and general practitioners will benefit going through these paper: (1) by understanding the diagnosis of bronchiolitis (2) being confident to treat uncomplicated bronchiolitis without antibiotics and (3) by limiting the indiscriminate use of antibiotics not misdiagnosing pneumonia for bronchiolitis.

If we can correctly manage bronchiolitis in terms of diagnosis and treatment, our small kids can get rid of unnecessary pricks!

MAGNITUDE OF LOWER RESPIRATORY TRACT INFECTION (BRONCHIOLITIS AND PNEUMONIA) AMONG THE UNDER FIVE CHILDREN ATTENDING AN UPAZILLA HOSPITAL OF BANGLADESH

Bidhan Chandra Podder, ARM Luthful Kabir

FCPS Part II (Paediatrics), Institute of Child and Mother Health (ICMH), Dhaka

Background : Lower respiratory tract infection (LRTI) is the major causes of morbidity and mortality in under 5 children. The two most important causes of LRTI in children are bronchiolitis and pneumonia.

Objectives: This study was conducted to understand the magnitude of pneumonia and bronchiolitis in a upazila hospital of a southern district of Bangladesh, to understand the ability of upazila hospital doctors to diagnose pneumonia and bronchiolitis based on clinical presentation and physical findings and also to find out the different modalities of treatment of pneumonia and bronchiolitis given by upazila hospital doctors.

Methodology: This cross sectional study was conducted in UHC, Sreepur, Magura for a period of 1 year. Total 600 cases between 1 month to 5 years of age were enrolled in the study. The inclusion criteria were any child between 1 month to 59 months presented with respiratory symptoms including cough/runny nose or breathing difficulty. For pneumonia diagnostic criteria was fever and cough with fast breathing, lower chest wall indrawing and coarse crackles on auscultation. For bronchiolitis diagnostic criteria was runny nose followed by breathing difficulty, chest indrawing and rhonchi on auscultation in children less than 2 years of age.

Results: The study included 600 children, in OPD 400 (66.7%) and in IPD 200 (33.3%). There were 376 (62.7%) male and 224 (33.3%) female cases, male female ratio being 1: 1.8. The age breakdown of children were ≤ 6 months 96(16%), 7-12 months 126(21%), 13-24 months 159(26.5%), and 25-59 months 219 (36.5%). Out of 600 cases upazila hospital doctors diagnosed pneumonia in 234 (39.0%) cases, bronchiolitis in 36 (6.0%) cases and other respiratory diseases 330 (55.6%) cases. On the contrary according to clinical criteria of this study, pneumonia was diagnosed in 135 (22.5%) cases, bronchiolitis was diagnosed in 184 (30.7%) and other respiratory diseases in 281 (46.8%) cases. So upazila hospital doctors over diagnosed pneumonia and under diagnosed bronchiolitis.

Common respiratory diseases diagnosed by upazila hospital doctors were ARI in 277(46.2%), severe pneumonia in 120(20.0%), pneumonia in 88(14.7%), bronchiolitis in 36(6%), very severe pneumonia in 26(4.3%), cough or cold in 48(8.0%), asthma in 4(0.7%) and others in 1(0.2%) cases.

Local hospital doctors diagnosed pneumonia as ARI in 43(43/135;31.9%) and bronchiolitis as ARI in 50 (50/184;27.2%) cases. They correctly diagnosed pneumonia in 85(85/135;63%) and bronchiolitis in 18(18/184;9.8%) cases.

Bronchiolitis was treated with oral antibiotics in 95 (51.6%), parenteral antibiotics in 86(46.7%), oral bronchodilator in 123 (66.8%), antihistamine in 52(28.3%), nebulization with salbutamol in 34 (18.5%), paracetamol in 11 (6.0%) and oxygen inhalation in 10(5.4%) cases. Pneumonia was treated with parenteral antibiotics in 59 (43.7%), oral antibiotics in 58(43%), oral bronchodilator in 87(64.4%), nebulized salbutamol in 24 (17.8%), oxygen inhalation in 20(14.8%), antihistamine in 26(19.3%) and paracetamol in 7 (5.2%) cases.

Most common antibiotics used for bronchiolitis was ceftriaxone in 86(49.4%) followed by cotrimoxazole in 25(14.4%), amoxicillin in 19(10.9%), cefixime in 8(4.6%), cephradin in 8 (4.6%), and azithromycin in 7(4%) cases. Pneumonia was treated mostly with amoxicillin 37(28.5%) followed by ceftriaxone in 32 (24.6%), cotrimoxazole in 19 (14.6%), cefixime in 13(10%), erythromycin in 6(4.6%), ampicillin and gentamycin in 7(5.4%) and cephradin in 7(5.4%) cases.

Conclusion: The study concluded that bronchiolitis and pneumonia were the predominant cause of upazila hospital visit among the respiratory cases in under 5 children. About one third of the respiratory cases were bronchiolitis and one fourth were pneumonia. Upazila hospital doctors correctly diagnosed pneumonia in 85(85/135; 63%) and bronchiolitis in 18(18/184; 9.8%) cases. There was overdiagnosis of pneumonia and underdiagnosis of bronchioitis by the upazila hospital doctors. Ceftriaxone was the commonest antibiotic used in case of bronchiolitis and amoxycillin was the commonest antibiotic used in cases of pneumonia followed by ceftriaxone, cotrimoxazole, cefixime, erythromycin, ampicillin & gentamycin and cephradin. There was inappropriate use of antibiotic in cases of bronchiolitis and also in pneumonia.

STUDY OF NUTRITIONAL STATUS OF CHILDREN (02-24 MONTHS) WITH ACUTE BRONCHIOLITIS AND PNEUMONIA

Nazmun Nahar Shampa, Md. Abid Hossain Mollah

FCPS Paediatrics Part II Examinee, Department of Paediatrics, Dhaka Medical College Hospital, Dhaka

Background: Pneumonia, the severe form of acute respiratory infection (ARI), is the leading cause of childhood mortality in developing countries including Bangladesh. It accounts for almost 28-34% of all under 5 deaths globally. Bronchiolitis is another distressing respiratory condition that affects young babies. However, the relation of these diseases with nutritional status is not well addressed.

Objectives: To assess the nutritional status of children aged 2-24 months with pneumonia and acute bronchiolitis and to compare the nutritional status between pneumonia and bronchiolitis patients.

Study design: Observational cross sectional study.

Study setting and period: Study was conducted in tertiary care hospital (Dhaka Medical College Hospital and Dhaka Shishu Hospital) from July, 2010 to June, 2011.

Materials and Methods: 50 Patients of pneumonia aged 2-24 months and 50 patients of bronchiolitis of same age group were taken from paediatrics indoor of Dhaka Medical College Hospital and Dhaka Shishu Hospital. Immediate medical history was taken from the parents through a structured questionnaire. Weight, length, MUAC and OFC were measured. Weight for age z-score, weight for length z-score, length for age z-score, z-score of OFC and MUAC were calculated to find out the nutritional status. All data were complied and analyzed manually. Normal range was defined as +2 to -1 z score mild as -1 to -2 z score, moderate as -2 to -3 z score and severe as <-3 z score. Results between pneumonia group and bronchiolitis group were compared by using calculated Z value. Calculated Z value more than 1.96 was regarded significant.

Results: 42% of pneumonia cases were female and 58% were male. 32% of bronchiolitis patients were female and 68% were male. 50% patients of pneumonia were between 2-6 months, 28% were between 6-12 months and 22% were between 12-24 months. On the other hand, 62% patients of bronchiolitis were between 2-6 months, 28% were between 6-12 months and 10% were between 12-24 months. 60% of pneumonia patients had moderate to severe wasting in comparison to 36% for bronchiolitis group. 44% of pneumonia patients had moderate to severe stunting where 28% of bronchiolitis patients had severe stunting. 50% of pneumonia patients are severely underweight in comparison to 30% severely underweight in bronchiolitis cases. Calculated Z value is significant for this group. Among 6-24 month old children 20% of pneumonia patients had MUAC <115 mm and 10.2% of bronchiolitis patients had < 115mm. The difference is statistically significant, 30% of pneumonia patients and 12% of bornchiolitis patient had OFC <-3 SD. The calculated Z value is statistically significant (>1.96).

Conclusion: In this study, among all parameters used to assess nutritional status of the pneumonia and bronchiolitis patients it was seen that pneumonia patients had significant (P value <0.05) severe underweight (50%), MUAC <115mm (20%) and microcephaly (30%) than bronchiolitis cases (30%), (10.2%) and (12%) cases respectively. Study of other nutritional parameters showed that pneumonia cases were more malnourished the bronchiolitis cases, though not significant (Moderate to severe wasting 60% vs 36%, moderate to severe stunting 44% vs 28%). Malnutrition and microcephaly were more prevalent in pneumonia cases than bronchiolitis cases.

HOW AND WHY WE MISS ACUTE BRONCHIOLITIS?

ARM Luthful Kabir, Md Ruhul Amin, Md. Abid Hossain Mollah, Shakil Ahmed, Khondker Rokonuddin, Al Amin Mridha, Kazi Selim Anwar

Bangladesh

Introduction

Bronchiolitis remains the commonest cause of acute lower respiratory tract infection (LRTI) in young children. About 21% of under-five years-old (U-5) children who attend various hospitals of Bangladesh suffer from bronchiolitis whereas it is 11.5% have pneumonia. "WHO Classified severe pneumonia" was found to be viral bronchiolitis in 65% cases in one study. Though uncomplicated bronchioitis can be managed in the hospital settings without antibiotics, it is treated with antibiotics in 99% cases. Moreover, deaths resulting from bronchiolitis were observed to merge with pneumonia mounting to pneumonia-deaths. Physicians in Bangladesh are oblivious of bronchiolitis and cases of bronchiolitis are misdiagnosed as pneumonia. Alarmingly, only 15.4% of bronchiolitis cases are reported to be diagnosed correctly at the community level.

How and why physicians miss bronchiolitis?

(1) While, Acute respiratory tract infection (ARI) Control Program (since 1992) exerted a huge impact on reducing childhood morbidity and mortality in adjunct with the introduction of Integrated Management of Childhood Illness (IMCI), (since 2000) in one hand, it may have confounded the process of under-reporting or misdiagnosing bronchiolitis cases in another hand. This remains one of the plausible bases of how and why our physicians miss most of bronchiolitis cases.

Following WHO/IMCI classification, any U-5 child suffering from cough, fast breathing and/or chest indrawing is classified as 'no pneumonia', 'pneumonia', or 'very severe disease'. In Bangladesh, around 10,000 health care providers (doctors/paramedics) who had been trained on ARI control/IMCI programs in 395 upazillas (sub-districts) of the country. Doctors consider classification (according to IMCI) of respiratory tract infection as the diagnosis of ARI cases. They don't feel like using (80.5% cases) stethoscope to diagnose lower respiratory tract disorders. They concentrate more on gross audio-visual features of respiratory disorders, like cough, wheeze, stridor, feeding difficulty, fast breathing, chest indrawing etc. to 'diagnose' various forms of ARI. The management of bronchiolitis has not been emphasized duly and there is no scope to differentiate pneumonia from bronchiolitis in the IMCI training module. More astonishingly, any child died of respiratory distress are 'illogically' labeled as 'pneumonia death'.

(2) General practitioners (GPs) also have the tendency to classify respiratory tract disorders as 'ARI', 'no pneumonia', or 'pneumonia' and prescribe antibiotics to remain on safe side. Noteworthy, that none or a little scope exists in our country for refresher trainings &/or periodic orientation on common childhood diseases and this make this confused scenario in compounded jeopardy.

(3) Media publicity gave this confused issue an added complexity: the general mass got an ever-growing perceived idea that any child with respiratory distress is most likely to suffer from 'pneumonia' and but nothing is focused on bronchiolitis.

(4) The 'go-slow' role or 'reluctant' attitude of pharmaceutical companies in promoting non-antibiotic management of bronchiolitis seems to be another confounder.

(5) There is dearth of facility to isolate respiratory syncytial virus and other viruses causing bronchiolitis even in the academic institutes like institutes of child health and medical colleges to boost up the confidence of etiological diagnosis of bronchiolitis.

Conclusion: The training programs of ARI Control/ IMCI (pre-service and in-service) designed for the for the medical students and field level health care providers only on the management of ARI/pneumonia (without highlighting bronchiolitis) and not providing refreshers trainings/periodic updates/ orientations on childhood respiratory illness remain the principal plausible reasons for keeping bronchiolitis in an oblivion state in developing countries. Moreover, the situation has become worse with media campaigns, inert role of pharmaceutical industries and non-existing facility to isolate viruses causing bronchiolitis at least for academic purposes.

Recommendation

To improve the management of bronchiolitis, it remains imperative to include bronchiolitis in the IMCI module, focusing the major differences in their treatment, counseling & management. However, inclusion of chest x-ray (available in country's almost all rural health care facilities) remains essential for the correct diagnosis of pneumonia and bronchiolitis. The availability of virus isolation at least in some selected centers and introduction of ICD-10 classification of diseases in medical recording would go a long way to optimize the management of all diseases including bronchiolitis. The related pharmaceutical companies should be well informed about the non-antibiotic management of bronchiolitis.

References

1. Kabir ARML, Haq N, Hoque M, Ahamed , Amin R, Hossain A, Khatoon S, Akhter S, Shilpi T, Haq R, Anisuzzaman S, Khan MH, Ahamed S, Khashru A. Evaluation of hospitalized children with bronchiolitis- a multicentre study. *Mymensingh Medical Journal* (*MMJ*) July 2003; 12(2): 128-33.
2. Kabir ARML, Mollah A, Anwar KS, Rahman F, Amin R, Rahman ME, Management of bronchiolitis without antibiotics: a multi-centre randomized control trial in Bangladesh. *Acta Paediatrica* 2009; 98 (10): 1593-1599
3. Kabir AL, Rahman AF, Rahman A. ARI situation in our country: Aren't we Oblivious of Bronchiolitis in Bangladesh. *Mymensingh Med J* 2009 Jan; 18 (1 Suppl): 50-55
4. Integrated Management of Childhood Illness (IMCI), Newsletter, Director General of Health Services (DGHS), Govt. of Bangladesh, UNICEF, 3rd issue 2012
5. Kabir ARML, Uchida R, Ahmed S, Shikder B, Ahmed SU, Khatun S. Predominance of viral bronchiolitis among children with WHO classified severe pneumonia. . Manuscript is under processing

International Journal of Infectious Disease 2012; 16 (12): 866-871

BRONCHIOLITIS OUTBREAK CAUSED BY RESPIRATORY SYNCYTIAL VIRUS IN SOUTHWEST BANGLADESH

Haque F[1], Husain MM, Ameen KM, Rahima R, Hossain MJ, Alamgir AS, Rahman M, Rahman M, Luby sp.

[1]Centre for communicable Diseases, International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B), Dhaka, Bangladesh. farhanahaque@icddrb.org

Background: During July 2010, newspapers reported a respiratory disease outbreak in southwestern Bangladesh resulting in the admission of children to a secondary care hospital. We investigated this outbreak to determine the etiology and explore possible risk factors.

Methods: The hospital's physician diagnosed children aged <2 years with cough, tachypnea or dyspnea, and expiratory wheeze as having acute bronchiolitis. We reviewed the hospital records and listed case patients admitted between 26 June and 26 July 2010. We surveyed the case patients and collected nasal and throat swabs to test for respiratory viruses.

Results: We identified 101 admitted acute bronchiolitis case patients. Fifty-nine (58%) of these were admitted between 16 and 20 July. Among the 29 case patients surveyed, the median age was 4 months and 65% were males. We identified respiratory syncytial virus (RSV) in 91% (21/23) of the samples, 43% of which had a dual viral infection. Most case patients (90%) were treated with broad-spectrum antibiotics. There were no reported deaths.

Conclusions: The sudden increase in admitted acute bronchiolitis case patients their median age, and identification of RSV in the majority of samples suggest an outbreak of RSV bronchiolitis. Research to identify strategies to prevent respiratory infections including RSV in low-income settings should be prioritized. Factors that perpetuate antibiotic use in managing this viral syndrome should also be explored.

EFFICACY OF ORAL PREDNISOLONE IN RELIEVING HYPOXIA IN CHILDREN WITH ACUTE BRONCHIOLITIS WHO HAVE A HISTORY OF ATOPY

Md. Azizul Hossain[1], Helalul Haq[2], Kazi Abdul Mannan[3], Musleh Uddin Ahmed[4], Shahab Uddin[5], Sartaj Begum[6]

[1]Associate Professor of Pediatric Nephrology, Comilla Medical College, [2]Indoor Medical Officer, Department of Pedictrics, Comilla Medical College Hospital, [3]Associate Professor and Head, Department of Pediatrics, Comilla Medical College. [4]Principal, Comilla Medical College, [5]Professor and Head, Department of Medicine, Comilla Medical College, [6]Assistant Professor of Gynecology and Obstetrics, Comilla Medical College

Background: Bronchiolitis is mostly a viral disease causing inflammation of the smallest airways and hypoxia is one of the major complications of it.

Objective: The study was conducted to find out the efficacy of oral prednisolone in relieving hypoxia in acute bronchiolitis who have a history of atopy.

Patients and Method: This clinical trial was carried out in the Department of Pediatrics, Comilla Medical College Hospital, between January 2012 to June 2012. A total of 85 patients having a history of atopy fulfilling the selection criteria were enrolled as study population by systematic random sampling. Prednisolone (2mg/kg/day) was given orally for three consecutive days in divided doses. The same amount of flour (placebo) was given in the same way. The standard treatment of acute bronchiolitis was given to both groups. Following randomization and intervention, monitoring was done by recording the presence or absence of fast breathing, use of accessory muscle, cyanosis and wheeze; twice daily for 3 days. SP02 was measured by pulse oximeter 8 hourly for 3 days.

Results: The clinical variables of acute bronchiolitis decreased significantly faster in the prednisolone group - fast breathing ($p<0.001$) to normal 36 hours and use of accessory muscle ($p<0.05$) to normal occurred in 12 hours; cyanosis disappeared in 4 hours ($p>0.1$); and wheezing ($p<0.01$) were normal in 72 hours. Duration of 0_2 therapy was less (22 hours) in the prednisolone group than in the placebo group (27 hours). Length of hospital stay was shorter in the prednisolone group ($p<0.001$) compared with placebo group. No patient developed any adverse event during the study period.

Conclusion: Three day oral prednisolone treatment was effective in accelerating clinical recovery in acute bronchiolitis cases who had a history of atopy.

Bangladesh J Child Health 2012; 36 (2) : 66-70

DISEASE PROFILE AND DEATH PATTERN AMONG CHILDREN ADMITTED IN A MEDICAL COLLEGE HOSPITAL

M Shameem Hasan, Sanat Kumar Barua, M Nasiruddin Mahmud, AHM Kamal, M Enayetullah, M Rezaul Karim

Chittagong Medical College Hospital (CMCH), Chittagong.

Background: An understanding of epidemiological trend in hospital admissions, including diseases and death pattern, is critical for health care planning, appropriate resource allocation & improving existing services facilities.

Objectives: To evaluate the disease and death pattern of children admitted in the department of Child Health, Chittagong Medical College Hospital (CMCH), Chittagong.

Materials and Methods: This was a retrospective study. The case records of all patients admitted in the department from Jan 1, 2008 to Dec 31, 2010 were analyzed. Result: Total 38,692 children were admitted during this study period; among them total 1897(4.9%) patient died. Infant and under five age groups constitute 45.2% and 75.9% respectively, total admission whereas deaths from the same groups were 43.7% & 79.3% respectively. Bronchopneumonia (22%), acute watery diarrhea (15%), hereditary hemolytic anemia (12%), and bronchiolitis (10%), topped the first four positions in each of the three years of admission. Septicemia and encephalitis, with a case fatality rate of 24% and 35% respectively, were found as top two causes of death. Highest case fatality rate was found in hepatic encephalopathy (54%). Other common causes of death include meningitis (19%), severe malaria (21%), leukemia (22%), severe malnutrition with complications (11%), and congenital heart diseases (12%)

Conclusion: Comprehensive evaluation of admission and death related findings of this study will help to determine possible gaps in patient care and planning for more effective case-management strategies.

CLINICO-ETIOLOGICAL STUDY OF BRONCHIOLITIS IN A TERTIARY CARE HOSPITAL

Mohammad Shohel, Md. Abid Hossain Mollah

FCPS (Paediatrics) Part-II, Department of Paediatrics, Dhaka Medical College Hospital Dhaka, Bangladesh

Background: Bronchiolitis is the leading cause of lower respiratory tract infection in infants. It remains a major public health problem throughout the world exerting significant morbidity and mortality. Respiratory syncytial virus is the most common cause of bronchiolitis in infants and young children. PCR for detection of viral aetiology at the point of care will be of extreme significance to identify the large group of infants and young children who need different modality of management resulting in optimized management and rational use of antibiotics.

Objectives: To see the clinical presentation of bronchiolitis and to identify its viral aetiology.

Methodology: This cross sectional study was conducted in the Department of Paediatrics, Dhaka Medical College Hospital, Dhaka during the period from January 2012 to June 2012. Thirty patients with clinical bronchiolitis fulfilling the inclusion and exclusion criteria were selected. Inclusion criteria were all patients with acute bronchiolitis aged between 1 month to 2 years. Neonate, babies with congenital heart disease, pneumonia or pulmonary tuberculosis and those improved after nebulization with salbutamol for 3 times at 20 min interval were excluded. After enrollment detailed clinical, hematological and radiological assessments were done. Nasopharyngeal aspirates from the patients were collected and tested for viral aetiology using polymerase chain reaction (PCR). All data were recorded in a pre-tested questionnaire and analyzed with the help of Statistical Package for Social Sciences (SPSS) 16.0 for windows.

Results: The mean age of the patients was 4.7 ± 6.0 months (ranged 38 days to 24 months) and most of the patients (90.0%) were under 6 months of age. There were 10.(60.0%) male and 12 (40.0%) female with male to female ration of 1.5:1.

Cough, breathing difficulty and wheezing were presenting symptoms in all patients. Other presentations were fever in 70.0%, running nose in 66.7% and feeding difficulty in 63.3% of patients. Chest in drawing and ronchi were found in all patients. Other findings were nasal flaring in 40.0%, head nodding in 23.3%, grunting in 26.7%, poor air entry in lung in 16.7%, liver enlargement in 46.7% and cyanosis in 3.3% of patients.

Leukocytosis was found in 10 (33.3%) and CRP was raised in 7 (23.3%) cases. X-ray was normal in 20.0%, increased translucency in 53.3% and hyperinflation of lungs in 76.7% of cases.

Respiratory syncytial virus was detected in 76.7% of cases as single agent and in combination of adenovirus in 3.3%, hMPV (human metapneumovirus) in 3.3% and both adenovirus and hMPV in 3.3% of cases.

Conclusion: It is concluded from the study that common clinical presentations of acute bronchiolitis are cough, breathing difficulty, wheezing and chest indrawing , fever and preceded running nose. Common aetiological agent is virus most commonly respiratory syncytial virus as single agent and in combination of adenovirus, human metapneumovirus.

ANAEMIA IS A RISK FACTOR OF BRONCHIOLITIS

Farhan Karim, ARM Luthful Kabir

Sir Salimullah Medical College & Mitford Hospital, Dhaka

Background: Bronchiolitis is a common lower respiratory tract infection and anaemia is also very common in children.Anaemia is a risk factor for many conditions like recurrent infection, developmental delay, febrile sezure, breath holding spell.

Objective: This study was conducted to explore the association between anemia with bronchiolitis

Methodology: This case control study was carried out in the Department of Paediatrics, Sir Salimullah Medical College & Mitford Hospital (SSMC & MH) Dhaka, during the period of September 2011 to August 2012. Hematological investitations were done like Hb%, RBC indices, serum iron & TIBC level in children with bronchiolitis and children without bronchiolitis and also to find out the risk factors associated with bronchiolitis. For this purpose, a total number of 92 consecutive patients were enrolled in this study, that of 50 children with bronchiolitis was consider as cases and 42 children without bronchiolitis was considered as controls, where the control was matched with age and sex. The investigation of serum ferritin level was not done because it is not reliable in cases with infections as it increases as acute phase protein (Ryan et al 1997). The following observations and results were obtained in this study.

Result: The mean age was found 8.1±5.5 month in cases and 7.9±6.5 months in controls. Male female ratio was 1.3:1. Formula milk and antibiotic intake were significantly ($P<0.05$) higher in cases. Formula feeding and antibiotic intake were 18.00 and 2.73 times increased in bronchiolitis cases respectively.

Overcrowding, cooking by wood/kerosene, and passive smoking in family were statistically significantly ($P<0.05$) higher in cases with an odds ratio of 19.25, 21.12 and 9.45 respectively, whereas older sib in family and family history of atopy were almost similar between two groups. MCV, MCH and MCHC were significantly ($P<0.05$) lower in cases whereas WBC was almost similar between two groups.

Microcytic hypochromic anemia and normocytic anemia were significantly ($P<0.05$) higher in cases and controls respectively. The mean serum iron was significantly ($P<0.05$) lower in cases. Low serum Iron level was found to be risk factor for bronchiolitis with an odds ratio of 13.81 with 95% confidence interval of 4.12 to 46.26 and the significant P value of 0.001. The mean TIBC was significantly ($P<0.05$) higher in cases with an odds ratio of 3.86.

Conclusion: This study was undertaken to explore the association between anemia with bronchiolitis. Hb%, MCV, MCHC and MCH were significantly ($P<0.05$) lower in children with bronchiolitis. Microcytic hypochromic anemia, low serum iron and higher TIBC were associated in children with bronchiolitis. Low serum Iron level was found to be risk factor for bronchiolitis with an odds ratio of 13.81. Bronchiolitis was more common in male children, low socio-economic status, non-exclusive breast feeding children and antibiotic received children. Overcrowding, cooking by wood and passive smoking in family were significantly associated with bronchiolitis.

PLOS ONE 2013; 8(1): e53857 (1-6)

CHALLENGES TO EVALUATING RESPIRATORY SYNCYTIAL VIRUS MORTALITY IN BANGLADESH, 2004-2008.

Stockman LJ[1], Brooks WA, Streatfield PK, Rahman M, Goswami D, Nahar K, Rahman MZ, Luby SP, Anderson LJ.

[1]National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention. Atlanta, Georgia, United States of America. lstockman@cdc.gov

Background: Acute lower respiratory illness is the most common cause of death among children globally. Data are not available to make accurate estimates on the global mortality from respiratory syncytial virus (RSV), specifically.

Methods: Respiratory samples collected from children under 5 years of age during 2004 to 2008 as part of population-based respiratory disease surveillance in an urban community in Dhaka, Bangladesh were tested for RSV, human metapneumovirus (HMPV), human parainfluenza virus (PIV) types 1, 2, and 3, influenza and adenovirus by RT-PCR. Verbal autopsy data were used to identify children who died from respiratory illness in a nearby rural community. Significance of the correlation between detections and community respiratory deaths was determined using Spearman's coefficient.

Results: RSV activity occurred during defined periods lasting approximately three months but with no clear seasonal pattern. There was no significant correlation between respiratory deaths and detection of any of the respiratory viruses studied.

Conclusion: Outbreaks of respiratory viruses may not be associated with deaths in children in the study site; however, the few respiratory deaths observed and community-to-community variation in the timing of outbreaks may have obscured an association. An accurate assessment of respiratory virus-associated deaths will require detections and death data to come from the same location and a larger study population.

BRONCHIOLITIS AND BANGLADESH

ARM Luthful Kabir, Md. Ruhul Amin, Md. Abid Hossain Mollah , Selina Khanam, Jasim Uddin Majumder, Al Amin Mridha, Sakil Ahmed, Khondoker Rokonuddin

Introduction: Bronchiolitis is the commonest cause of acute LRTI in young babies. The epidemic of bronchiolitis was first reported in Bangladesh during 2001-2002 and this high rate continued to prevail over the next coming years. About 21% of <5-children who attend different hospitals of Bangladesh have bronchiolitis. The case definition of bronchiolitis is very simple and purely clinical: any child <2 years of age presenting with preceding or existing runny nose, cough, chest in-drawing and rhonchi on auscultation. Respiratory syncytial virus (RSV) is the commonest cause. Increased translucency and hyperinflation are the commonest radiological features. Uncomplicated bronchiolitis can be managed in the hospital settings without antibiotics.

We are oblivious of bronchiolitis: Doctors of Bangladesh are oblivious of bronchiolitis and the cases of bronchiolitis are misdiagnosed as pneumonia. The sensitivity and specificity of diagnosing bronchiolitis by our doctors are 15.4% and 98.7% respectively. "WHO classified severe pneumonia" was found to be viral bronchiolitis in 65% cases.

Mismanagement of bronchiolitis: Bronchiolitis is treated with antibiotics in 99% cases and ceftriaxone is the commonest prescribed antibiotic. Moreover, deaths from bronchiolitis have merged with pneumonia deaths giving rise to the bulk of ARI/pneumonia deaths.

Management can be optimized: The rate of recovery of non-chesty features (e.g. feeding difficulty, sleeping difficulty, inconsolable cry, no social smile, hypoxemia etc.) is rapid in contrast to the gradual recovery of chesty features (e.g. cough, runny nose, wheeze, breathing difficulty, tachypnea, tachycardia etc.). The distinction between pneumonia and bronchiolitis is obvious if simple clinical acumen is applied. Management of uncomplicated bronchiolitis is possible without antibiotics and only supportive measures are enough in hospital settings even in low-income countries.

Conclusion: Bronchiolitis needs to be diagnosed correctly and the indiscriminate use of antibiotics should be limited.

ICMH Journal 2013; 4(1); 19-25

MAGNITUDE OF THE RESPIRATORY DISORDERS IN UNDER FIVE CHILDREN ATTENDING THE UPAZILA HOSPITALS OF BANGLADESH

Mohammad Rezaul Haque, ARM Luthful Kabir, Sonia Jesmin, Nasir Uddin, Md. Abidul Haque, Sadeque Hasan, Md Jashim Uddin Mazumder, Md. Delwer Hossain, M A Mannan

Institute of Child and Mother Health (ICMH), Dhaka

Objective : This cross sectional study was conducted to find out the magnitude of respiratory disorders in under five children in different upazila hospitals in Bangladesh.

Methodology: Twelve upazila hospitals were randomly selected from all six divisions of Bangladesh. Data were collected from all children who attended outdoor patient department (OPD) and hospitalized into indoor patient department (IPD) on the day of visiting the hospitals as regards to number of children, clinical diagnosis of all respiratory cases in a structured questionnaire.

Result: Total children surveyed in this study was 1006 (Outdoor 938, Indoor 68) and the number of children who had respiratory problems were 773 (77%). The percentage of outdoor cases was 719 (93%) and indoor cases 54 (7%).

There were 452(58%) male and 321(42%) female cases. The age distribution of children who attended the hospitals were 1-6 months 18.5%, 7 to 12m-19.5%, 13 to 24m 20.2%, 25 to 59m 41.8%, mean age 24.5 m.

Clinical diagnosis of important respiratory disorders were common cold 371(48%), bronchiolitis 143(18.5%), pneumonia 52 (6.7%), asthma 80 (10.3%) and others 127 (16.4%).

Conclusion : This study disclosed that the respiratory disorders in under five children attending the different upazila hospitals were common cold 48%, bronchiolitis 18.5%, pneumonia 6.7% and asthma 10.3%.

JAFMC Bangladesh. Vol 9, No 2 (December) 2013: 70-76

ROLE OF ANTIBIOTIC IN BRONCHIOLITIS MANAGEMENT

Akhtar K, Chowdhury RB, Rahman MT

Combined Military Hospital (CMH), Dhaka

Introduction: Bronchiolitis is the most common illness among the patients attending the outpatient departments of CMH. It is predominantly a viral disease affecting the infants and young children. Though Antibiotic has little role, pediatricians frequently use them during bronchiolitis management. Very few randomized control trials without antibiotics in the management of bronchiolitis have so far been done.

Objectives: To evaluate the outcome of bronchiolitis with or without antibiotics in a hospital setting.

Methods: This prospective randomized control study was done in CMH Savar, during six months from October 2012 to March 2013. All the children below two years admitted in CMH Savar with first attack of Clinical Bronchiolitis were our study population. Exclusion criteria were: (i) atopic condition, (ii) congenital heart disease and/or (iii) known immunodeficiency. Study cases were randomly assigned into one of the two groups, AB group (Erythromycin/Amoxycilin) and NAB group (No Antibiotic).The NAB group was considered as control group. Supportive treatment was given according to the national guideline for management of bronchiolitis. Presenting symptoms and signs were followed-up twice daily while hospitalized and 7 days after discharge to determine the progress of disease. Outcome was determined by the progress of the variables in the structured follow-up format. Permission of commanding officer CMH Savar and verbal consent of the parents were taken before the study.

Results: Fifty-four cases who could be followed up till after seven days of discharge were finally included in the study. Among them about half (25/54) received oral or intravenous antibiotic while rest (29/54) received only supportive therapy but no antibiotic (NAB group). Most of the cases were below six months of age. Male were about double of the female (37:17). The presenting features were cough, wheeze, fever and feeding difficulty. Clinical features of both groups progressed similarly in both the groups. With the given treatment 24 (96%) cases from AB group and 27 (93%) cases from NAB group improved and were discharged safely. 01 from AB and 02 from NAB group deteriorated and were then treated with broad spectrum antibiotics. There was no death. Mean hospital stay of AB group (5.6 days) was little longer than NAB group (4.2 days) and 16% (4/25) of them had respiratory symptoms at seven days follow up, but the difference of outcome between the two groups was not statistically significant.

Conclusion: Antibiotics have no role in acute bronchiolitis management.

EFFICACY OF NEBULIZED HYPERTONIC SALINE VERSUS NORMAL SALINE & SALBUTAMOL IN TREATING ACUTE BRONCHIOLITIS IN A TERTIARY HOSPITAL- A RANDOMIZED CONTROL TRIAL

Rumi Myedull Hossain, Md. Abid Hossain Mollah

Dhaka Medical College Hospital (DMCH), Dhaka

Objective: To evaluate the efficacy of nebulized hypertonic saline in children with acute bronchiolitis in the improvement of clinical features and decrease length of hospital stay.

Methodology: The study was a randomized control trial carried out in the Department of Paediatrics, Dhaka Medical College Hospital (DMCH), Dhaka between January 2013 to December 2013. A total 100 children from 1 month to 24 months of age irrespective of sex with clinical presentation of bronchiolitis admitted in the paediatric wards of DMCH were included in the study and were randomly assigned to either 4 ml 3% hypertonic saline nebulization (Group I=50) or to 4ml normal saline and 0.4ml mg salbutamol nebulization (Group II=50). The therapy was repeated 8 hourly every day for 120 hours.

Results: The clinical severity scores (CS) based on respiratory rate, wheezing, chest retraction and general conditions at baseline on the first day of treatment were 9.0±1.0 in Group 1 and 9.3±1.8 in Group II (not significant). The study demonstrated that clinical severity and oxygen saturation in room air improved by three days but the reduction was more significant in children who received nebulized hypertonic saline compared to those who received nebulized normal saline and salbutamol. The cases of Group I required a shorter duration of oxygen therapy compared to those of Group II (15±6.0 hours vs 26.4±5.4 hours. $P < 0.05$). 47 patients (94%) were discharged within 72 hours of treatment in Group I and 29 patients (58%) in Group II. Length of hospital stay was shorter in Group I 58.1±22.0 hours. None of the cases of any group encountered any side effects due to study drugs.

Conclusion: 3% Hypertonic saline nebulization significant reduces clinical severity and length of hospital stay in case of acute bronchiolitis in comparison to normal saline and salbutamol nebulization.

COMPARISON EFFICACY OF NEBULIZED 3% HYPERTONIC VS 0.9% NS IN CHILDREN WITH BRONCHIOLITIS

Khandaker Tareq, Md. Abid Hossain Mollah

Dhaka Medical College Hospital (DMCH), Dhaka

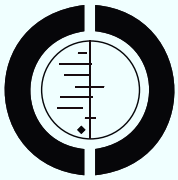
Background: Acute bronchiolitis is the leading cause of hospitalization in infants below 2 years of age. Bronchiolitis being a viral disease, there is no effective treatment other than supportive care. Of the supporetive cares, 3% nebulized hypertonic saline and 0.9% nebulized isotonic saline are often used, although there is disagreement over their efficacy in terms of reducing the clinical severity of the disease and shortening the length of hospitalization.

Objectives: To evaluate the efficacy of 3% hypertonic saline in children with acute bronchiolitis in reducing clinical severity and length of hospital stay.

Methodology : The study was a randomized control trial carried out in the Department of Pediatrics, Dhaka Medical College Hospital (DMCH), Dhaka between January 2013 to December 2013. A total of 90 children from 1 month to 2 years of age irrespective of sex with clinical presentation of bronchiolitis admitted in the Pediatric wards of DMCH were included in the study and were randomly assigned to either 3% nebulized hypertonic saline (Group I = 45) or to 0.9% nebulized isotonic saline (Group II=45). The main outcome variables were clinical severity score and length of hospital stay. The outcome was evaluated at 12 hourly intervals till discharge (up to 120 hours).

Results: The study groups were almost similar with respect to their demographic characteristics like age and sex and baseline clinical characteristics like respiratory rate score, wheezing score, retraction score, general condition score, clinical severity score, heart rate and oxygen saturation in room air. The study demonstrated that respiratory score, wheezing score, retraction score, general condition score and clinical severity score of both the treatment groups were reduced and oxygen saturation in room air was improved by three days but the reduction was more significant in children who received 3% nebulized hypertonic saline compared to those who received 0.9% nebulized normal saline. The cases of hypertonic saline group required a shorter duration of oxygen therapy compared to those of normal saline group (15.0±6.0 hours vs 26.4±5.37 hours, $p<0.05$). Forty two (93.3%) of the 3% hypertonic saline group children recovered by the end of 72 hours and was discharged home safety whereas 26 (57.8%) of the 0.9% normal saline group children recovered from the disease during the same period. Length of hospital stay was shorter in hypertonic saline group compared to normal saline group 58.1±22.0 hours vs 74.7±27.2 hours, P=0.002). None of the cases in the present study encountered any side effects.

Conclusion: The study concluded that 3% hypertonic saline nebulization significantly reduced clinical severity, length of hospital stay and duration of oxygen therapy in case of acute bronchiolitis in comparison to 0.9% normal saline. Both the modalities of treatment were found to have no adverse effect.



Antibiotics for bronchiolitis in children under two years of age (Review)

Rebecca Farley[1], Geoffrey KP Spurling[1], Lars Eriksson[2], Chris B Del Mar[3]

This is a reprint of a Cochrane review, prepared and maintaine d by The Cochrane \ Collaboration and published in The Cochrane Library

2014, Issue 10
http://www.thecochranelibrary.com

WILEY

Background: Bronchiolitis is a serious respiratory illness that affects babies. It ismost commonly caused by respiratory syncytial virus (RSV) and is the most common reason for hospitalisation in babies younger than six months. Babies usually present with runny nose, cough, shortness of breath and signs of difficulty in breathing, which can become life-threatening. Despite its viral cause, antibiotics are often prescribed. Prescribers may be expecting benefits from anti-inflammatory effects attributed to some antibiotics or be concerned about secondary bacterial infection, particularly in children who are very unwell and require intensive care.We wanted to discover if antibiotics improved or worsened clinical outcomes in children with bronchiolitis.

Objectives: To evaluate the effectiveness of antibiotics for bronchiolitis in children under two years of age compared to placebo or other interventions.

Search methods: We searched the Cochrane Central Register of Controlled Trials (CENTRAL 2014, Issue 6), which includes the Cochrane Acute Respiratory Infection Group's Specialised Register, and the Database of Abstracts of Reviews of Effects, MEDLINE (1966 to June 2014), EMBASE (1990 to June 2014) and Current Contents (2001 to June 2014).

Data collection and analysis. Two review authors independently analysed the search results.

Selection criteria: Randomised controlled trials (RCTs) comparing antibiotics to placebo in children under two years diagnosed with bronchiolitis, using clinical criteria (including respiratory distress preceded by coryzal symptoms with or without fever). Primary clinical outcomes included time to resolution of signs or symptoms (pulmonary markers included respiratory distress, wheeze, crepitations, oxygen saturation and fever). Secondary outcomes included hospital admissions, length of hospital stay, readmissions, complications or adverse events and radiological findings.

Results of the search: Initial database searching revealed the following results: 173 articles in MEDLINE, 102 articles in EMBASE, 23 articles in CENTRAL and two articles inDARE.Of these 300 artic*l*es, we rejected 297 on the basis of title and abstract alone leaving three studies. In the 2011 update, we identified an additional 259 studies, with 35 duplicates and 220 rejected on title and abstract alone with four studies remaining. Of the seven studies identified from initial and updated searches, we excluded two: one because it did not involve clinical criteria for inclusion (Friis 1984), and one because it did not involve an antibiotic (Boogaard 2007). *Five studies did meet*

the inclusion criteria (Field 1966; **Kabir 2009;** *Kneyber 2008;* **Mazumder 2009***; Tahan 2007).* In this 2014 update, following removal of duplicated studies, the searches resulted in the identification of a further 169 articles. We retrieved five articles for further evaluation. Two of these reported data fromstudies thatmet the inclusion criteria (McCallum2013; Pinto 2012).We excluded three articles as they related to the study reported in McCallum 2013 and did not include any outcome data.

In total 728 in studies were found in field of antibiotics and bronchiolitis during last 48 years (1966 - 2014).

Included studies : *Field 1966, Tahan 2007, Kneyber 2008,* **Mazumder 2009***,* **Kabir 2009***, Pinto 2012 and McCallum 2013* ***(7 studies)*** met the inclusion criteria, randomising children to antibiotics or control groups. All study participants were children under two years of age except for Tahan 2007, which only included children under sevenmonths of age. Two studies were conducted in low-income countries, both in Bangladesh **(Kabir 2009; Mazumder 2009)**. These two studies compared oral erythromycin with intravenous ampicillin and control. Two studies were conducted in upper-middle income countries. Tahan 2007 (Turkey) compared clarithromycin with placebo, while Pinto 2012 (Brazil) compared azithromycin with placebo. Kneyber 2008 and McCallum 2013 were conducted in high-income countries and compared azithromycin with placebo. Field 1966, also conducted in a high-income country, compared oral ampicillin with placebo. All studies included participants who were hospitalised and only one study recruited froman outpatients department **(Mazumder 2009).** Only the two most recent studies clearly identified their funding sources (McCallum 2013; Pinto 2012).

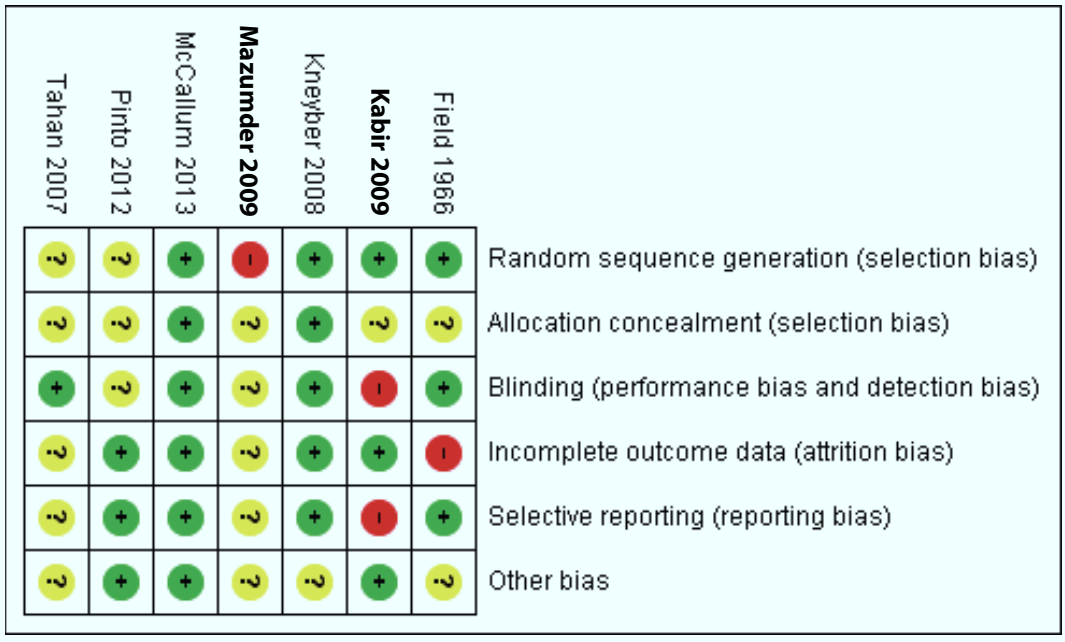


Fig.-1: *Methodological quality summary: review authors' judgements about each methodological quality item for each included study.*

Excluded studies: Boogaard 2007 did not study antibiotics for bronchiolitis. We excluded one study because it dealt with both pneumonia and bronchiolitis using crepitations and radiography as criteria for patient selection (Friis 1984). The study did perform a subgroup analysis of the two groups (antibiotics and placebo) based on virological diagnosis and these results are discussed.

Summary of main results

Six included studies did not find any difference between antibiotics and placebo for their primary outcomes of length of illness (Field 1966) or length of hospital stay (Kabir 2009; Kneyber 2008; Mazumder 2009;McCallum 2013; Pinto 2012). One small study with a high risk of bias found that three weeks of clarithromycin significantly reduced hospital admission compared to placebo (Tahan 2007). This reduction in hospital readmissions was not replicated in a more recent study that randomised 97 children to receive either a single large dose of azithromycin or placebo (n = 50 azithromycin, n = 47 placebo) (McCallum 2013). Another study with a high risk of bias found mixed results for the effects of antibiotics on wheeze but no difference for other symptom measures (Mazumder 2009).

We only combined data for deaths, duration of supplementary oxygen use and length of hospital stay. There were no deaths in any arms of any of the seven included trials. For duration of supplementary oxygen use, we combined three studies comparing azithromycin versus placebo (Kneyber 2008; McCallum 2013; Pinto 2012). The three studies providing adequate data for days of supplementary oxygen showed no difference between antibiotics and placebo (pooled mean difference (MD) -0.20; 95%con- fidence interval (CI) -0.72 to 0.33). For length of hospital stay, we combined data fromthree studies comparing the use of azithromycin versus placebo as a subtotal as part of the overall analysis of the effect of antibiotics on hospital stay (Kneyber 2008; McCallum 2013; Pinto 2012).One other study comparing erythromycinwith placebo was not included because its addition resulted in statistically significant heterogeneity of the pooled results. This study had a higher risk of bias and it used a different antibiotic (erythromycin rather than azithromycin) as the intervention (Kabir 2009). The three studies providing adequate data for length of hospital admission similarly showed no difference between antibiotics (azithromycin) and placebo, providing a pooled MD of -0.58 days (95% CI -1.18 to 0.02) with acceptable statistical heterogeneity. Two studies providing sufficient data to compare hospital readmissions showed no significant difference between antibiotic and placebo groups but we did not pool data as there was a substantial risk of heterogeneity (I2statistic = 59%) (McCallum 2013; Tahan 2007).

Authors' Conclusions

Implications for practice : Overall, this review does not support the use of antibiotics for bronchiolitis. Antibiotics may be justified in children with bronchiolitis who have respiratory failure.

Acknowledgements

We would like to thank the following people for their comments on the draft review: Anne Lyddiatt, David Isaacs, Federico Martinón- Torres, **Luthful Kabir**, Max Bulsara and Juan Lozano. We also thank the following people for commenting on the updated

review drafts: Linda Hornbeek, Liz Whamond, Amanda Roberts, Richard Taggart, David Isaacs, Federico Martinón-Torres, Rob Ware, Teresa Neeman and Inge Axelsson. We would like to acknowledge Dr Kit Fonseka who co-wrote the initial protocol, reviewed the search results, performed quality appraisal, extracted data and helped write the first version of this review. Jenny Doust gave advice on performing the systematic review, critically appraised primary data, extracted data and helped write the protocol and the first two versions of this review.

References:

References to studies included in this review

1. **Field 1966** ***{published data only}***
   Field C, Connolly J, Murtagh G, Slattery C, Turkington E. Antibiotic treatment of epidemic bronchiolitis - a doubleblind trial. *British Medical Journal* 1966;**1**:83–5.

2. **Kabir 2009** ***{published data only}***
   Kabir A, Mollah A, Anwar K, Rahman A, Amin R, Rahman M. Management of bronchiolitis without antibiotics: a multicentre randomized control trial in Bangladesh. *Acta Paediatrica* 2009;**98**:1593–9.

3. **Kneyber 2008** ***{published and unpublished data}***
   Kneyber M, van Woensel J, Uijtendaal E, Uiterwaal C, Kimpen J. Azithromycin does not improve disease course in hospitalized infants with respiratory syncytial virus (RSV) lower respiratory tract disease: a randomized equivalence trial. *Pediatric Pulmonology* 2008;**43**:142–9.

4. **Mazumder 2009** ***{published data only}***
   Mazumder M, Hossain M, Kabir A. Management of bronchiolitis with or without antibiotics - a randomized control trial. *Journal of Bangladesh College of Physicians and Surgeons* 2009;**27**(2):63–9.

5. **McCallum 2013** ***{published data only (unpublished sought but not used)}***
   McCallum G, Morris P, Chatfield M, Maclennan C, White A, Sloots T, et al.A single dose of azithromycin does not improve clinical outcomes of children hospitalised with bronchiolitis: a randomised, placebo-controlled trial. *PLoS One* 2013;**8**:9.

6. **Pinto 2012** ***{published data only (unpublished sought but not used)}***
   Pinto L, Pitres P, Luisi F, Piccoli de Mello P, Gerhardt M, Ferlini R, et al.Azithromycin therapy in hospitalised infants with acute bronchiolitis is not associated with better clinical outcomes: a randomised, double-blinded, and placebocontrolled clinical trial. *Journal of Paeditrics* 2012;**161**: 1104–8.

7. **Tahan 2007** ***{published and unpublished data}***
   Tahan F, Ozcan A, Koc N. Clarithromycin in the treatment of RSV bronchiolitis: a double-blind, randomised, placebocontrolled trial. *European Respiratory Journal* 2007;**29**:91–7.

CARDIOVASCULAR CHANGES IN CHILDREN WITH ACUTE LOWER RESPIRATORY INFECTION

Shahreen Kabir, Luthful Ehsan Fatmi
Dhaka Medical College Hospital (DMCH), Dhaka

Introduction: Acute Lower Respiratory Tract Infections, particularly Pneumonia and Brochiolitis, are important causes of death in childhood in Bangladesh. The cardiovascular and respiratory systems function as a single unit and alteration in cardiorespiratory interactions, can cause significant changes in cardiac function.

Objectives: The study was designed to evaluate the cardiovascular changes in children with acute lower respiratory tract infection.

Methodology:

Study design: Prospective observational study

Study setting and period: Study was done at the Department of Paediatrics of Dhaka Medical College and Hospital.

Study period was from January to December 2012.

Participants of the study: Thirty-five consecutive children aging from 2 months to 5 years with acute lower respiratory tract infection were selected and enrolled into the

Procedure: Children of 2 months to 5 years of age were enrolled and were evaluated both clinically and through investigations at the study place. Pre tested semi structured Questionnaire was used for data collection.

Results: The study revealed that most (82.8%) of the study population are less than 6 months of age and majority (80%) of them were male. Out of the 35 patients 57.1% were diagnosed as Bronchiolitis and the rest 42.9% as Bronchopneumonia. ECG findings revealed that 66.7% of children with pneumonia and 45% children with bronchiolitis had tachycardia which was out of proportion with temperature according to their age; however no arrhythmia was recorded. Abnormal Echocardiographic findings were noted in the form of Pulmonary hypertension in 33.3% and 15% patients with pneumonia and bronchiolitis respectively, LV systolic Dysfunction in 40% and 30% of the pneumonia and bronchiolitis group respectively, and Tricuspid Regurgitation in 2% and 1% of pneumonia and bronchiolitis group respectively. CK-MB was raised in both the bronchopneumonia and bronchiolitis group, was significantly higher in patients with tachycardia and having abnormal Echocardiographic changes. 9 patients developed heart failure, out of which 6 belonged to the bronchiolitis group and the remaining 3 in the pneumonia group. CK-MB was raised in all the patients with heart failure. All the patients survived.

Conclusions: Cardiovascular changes were common in children with acute lower respiratory tract infection. Changes are evident both clinically and by investigations in both the pneumonia and bronchiolitis group. Clinically the changes include tachycardia and cardiac failure in both the groups. Laboratory changes include raised CK-MB, tachycardia in ECG and echocardiographic changes in the form of pulmonary hypertension with left ventricular systolic dysfunction. All the changes were equally present in both the groups of lower respiratory tract infections. Therefore it can be concluded that children with pneumonia and bronchiolitis both have similar cardiovascular changes. Cardiovascular changes in ALRI are associated with increased hospital stay and thus bed occupancy.

Northern International Medical College Journal 2014; 4(1): 9-11

EFFICACY OF PREDNISOLONE FOR CHILDREN WITH ACUTE BRONCHIOLITIS HAVING FAMILY HISTORY OF ATOPY: A RANDOMIZED PLACEBO-CONTROLLED TRIAL

Md. Abid Hossain Mollah, Khondaker Zahirul Hasan

Department of Paediatrics, Dhaka Medical College, Dhaka

Background: Acute bronchiolitis is a significant health problem among young children and is the leading cause of hospitalization in infants below 2 years of age. Annual incidence of acute bronchiolitis in USA is 11.4% below 1 year of age. Presence of atopy in the first degree relatives is associated with increased atopy in the children. Experimental and clinical evidence suggests that respiratory syncytial virus (RSV) bronchiolitis is an immune mediated disease & children who have bronchiolitis along with H/o atopy in the family pose more sufferings than bronchiolitis alone and in this situation steroid is found effective.

Objectives: To determine the efficacy of oral prednisolone among children with acute bronchiolitis and have family history of atopy.

Methodology: It was a randomized double blind placebo controlled trial. The study was carried out in the department of paediatrics; Dhaka Medical college hospitai, Dhaka from July 2008 to June 2010.

A total of sixty patients were enrolled in the study.Thirty was enrolled as cases and thirty as control. Group allocation to either Prednisolone or placebo was done by lottery method. To avoid observer and responder bias both patient's parents and the investigator were blinded. Prednisolone or placebo was given orally at a dose of 2mg/kg/.day for three consecutive days in 2-3 divided doses. The standard treatment of acute bronchiolitis was given to both groups (e.g; 02, hydration, nutrition, nebulized salbutamol, parenteral antibiotics etc.).

Following randomization and intervention, cases were monitored by modified respiratory distress assessment instrument (MRDAI) score twice daily for 3 days. The time required from the initiation of the oxygen therapy to the withdrawal of oxygen therapy was also recorded. Oxygen therapy was stopped when the patients maintained SpO_2 in the room air >95%.

Results: The respiratory rate, accessory muscle use and auscultatory finding score significantly declined in Prednisolone group (study group) compared to placebo group(p>.05).Cyanosis score also declined in both the group but difference is not' significant(p>.05).Requirement of oxygen therapy was found to be more in placebo group (24.1hours) than the Prednisolone group (13.7 hours) (P<.01). Length of hospital stay was shorter in prednisolone group (3.3 days) compared to placebo(4.6days) group(p<.001). No patient developed any adverse event during the study period.

Conclusion: The study concluded that among cases of acute bronchiolitis having family history of atopy three days oral prednisolone therapy was found to be useful in terms of clinical recovery,oxygen requirement and duration of hospital stay.

Bangladesh J Physiol Pharmacol 2014; 30(2):9-13

PATTERNS OF MEDICINE USE IN PATIENTS OF COMMON RESPIRATORY DISEASES TREATED IN THE DEPARTMENT OF PEDIATRICS OF BSMMU HOSPITAL

Swarmita Afreen, Md Sayedur Rahman

[1]Department of Pharmacology, Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka, Bangladesh, [2]Professor, Department of Pharmacology, Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka, Bangladesh

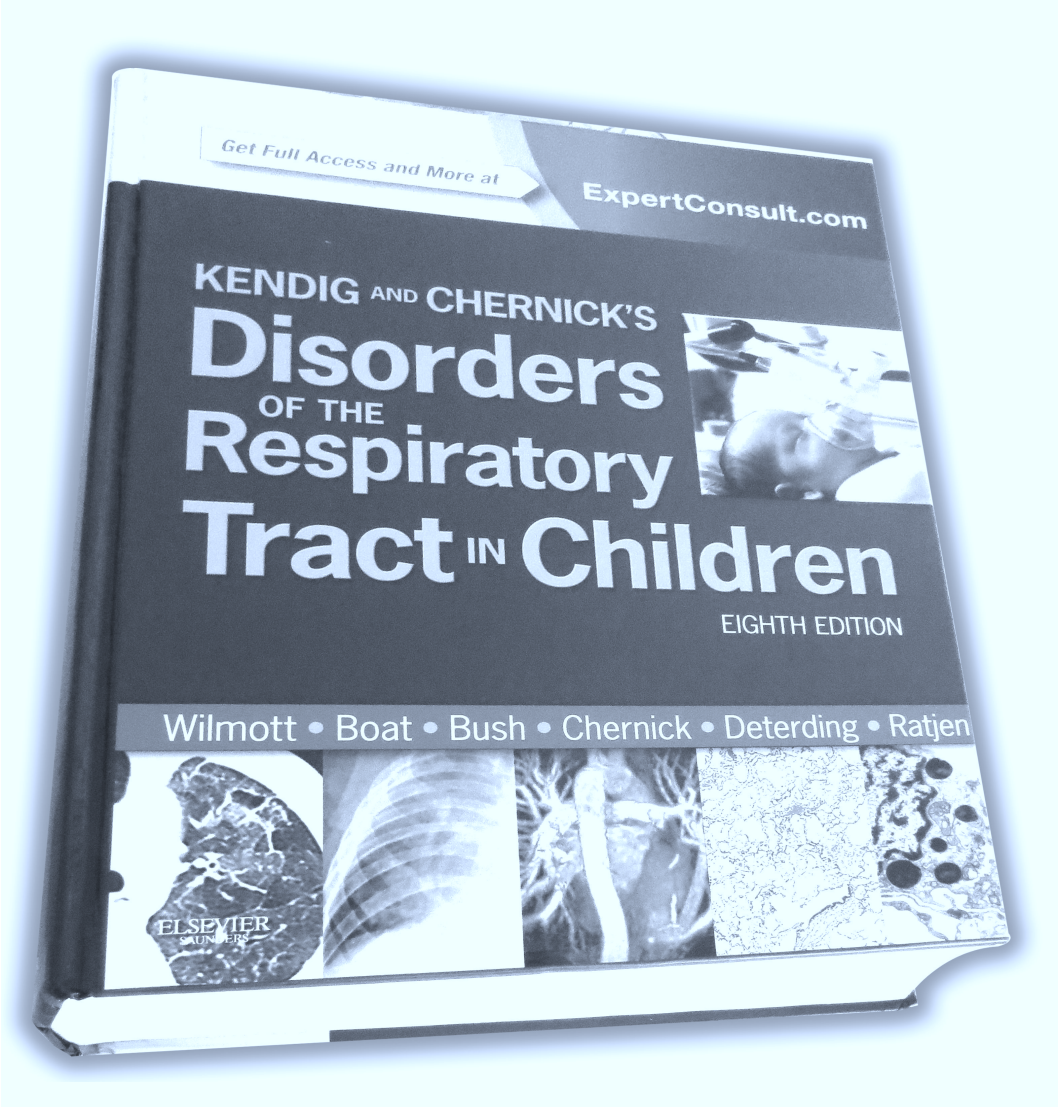
The present study had attempted to evaluate the medicine use pattern in selected respiratory diseases treated in the Department of Pediatrics of Bangabandhu Sheikh Mujib Medical University (BSMMU) Hospital.

An observational cross sectional study was conducted in the department of Pediatrics, Bangabandhu Sheikh Mujib Medical University (BSMMU) between January 2012 to June 2013. Retrospective prescribing data of sixty cases of bronchiolitis and childhood pneumonia and thirty cases of bronchial asthma was collected from the Record Room and reviewed for inclusion. Then the included treatment records were reviewed and appraised thoroughly. Information regarding patient profile, clinical diagnosis and detail information about medicine was documented in an audit form.

Average number of medicine was 3.84, 4.31 and 4.47 in bronchial asthma, bronciholitis and pneumonia respectively and 4.28 for respiratory diseases. Generic prescribing was 12.46% for department of Pediatrics. Antimicrobials were used in 90.00, 96.66 and 100.00 percent cases of bronchial asthma, bronchiloitis and pneumonia respectively. In case of pneumonia, highest prescribed antimicrobial was Ceftriaxone. Intravenous and oral steroids were used in 63.33, 26.66 and 0.00 percent cases of bronchial asthma, bronchiloitis and pneumonia respectively. Wide variation was observed with medicine selection in different respiratory diseases treated in the department of Pediatrics of BSMMU.

Appropriateness of prescribing cannot be ascertained by medicine use study only. It was revealed that lots of diversity was present in the treatment or selection of medicine. Detail study using newer and comprehensive method and indicators may provide better understanding about prescribing, which might be beneficial to formulate interventions.

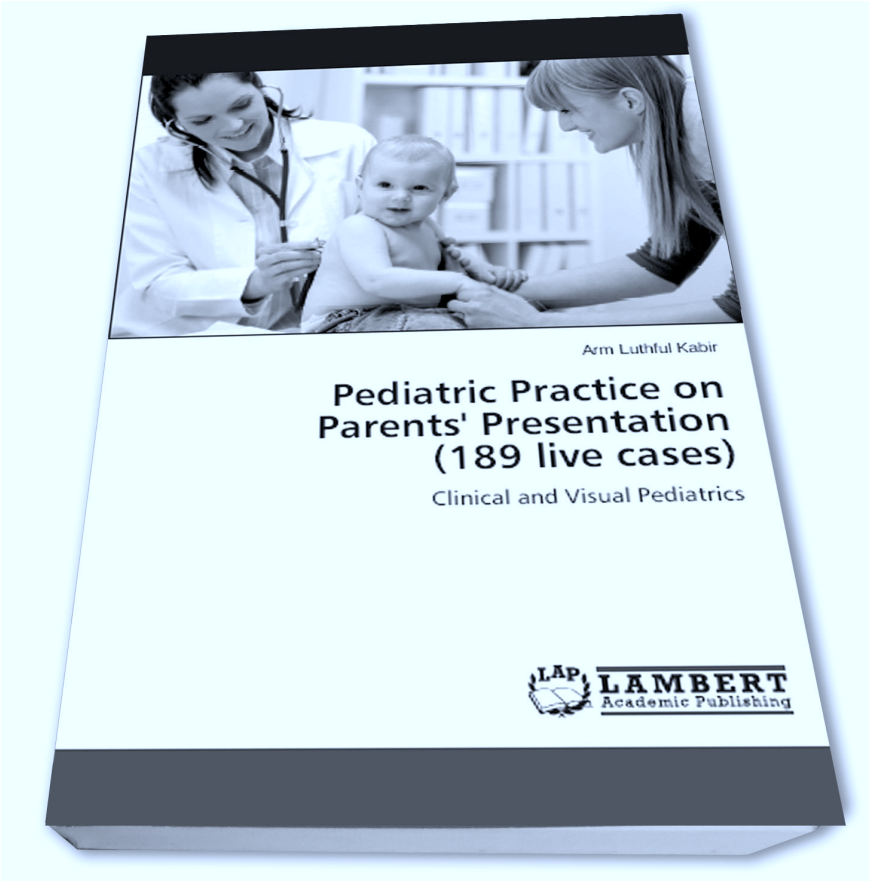
BRONCHIOLITIS IN BOOK REFERENCE - 1



Quotation in page no. 448.

A recent moderate-sized study (n=295) of antimicrobial use in infants with bronchiolitis demonstrated that there was no clinical advantage to using antimicrobials in the care of such children. The authors concluded that supportive measures without antimicrobials remained the standard of care in the hospital setting.[75] ARML Kabir, AH Mollah, KS Anwar, AKMF Rahman, R Amin, ME Rahman. Management of Bronchiolitis Without Antibiotics: A Multicentre Randomized Control Trial in Bangladesh. *Acta Paediatrica.* 2009; 98(10): 1593-1599.

BRONCHIOLITIS IN BOOK REFERENCE - 2



Page no. 266

Lambert Academic publishing, Germany, 2014.

BRONCHIOLITIS

LIVE CASE

PP ▶ Shamim, a 5 months old male infant presented with:

- **Runny nose for 7 days**
- **Cough and difficult breathing for 2 days**
- **Poor feeding for 4 hours**

H ▶ Shamim was quite well 7 days back. Then he developed runny nose for 7 days. followed by cough and difficult breathing for 2 days. Cough aggravated at night. Mother also complained that difficult breathing

no murmur. Abdomen was soft and liver was pa
2 cm from RCM. Spleen was not palpable. SaC
82%.

RECOVERY OF CHILDREN FROM PNEUMONIA AND BRONCHIOLITIS (ALRTIS)

Naima Sultana, Md. Abid Hossain Mollah

Department of Paediatrics, Dhaka Medical College Hospital, Dhaka

Objective: To determine the recovery of different clinical features (symptoms, signs, LOS and outcome) of pneumonia and bronchiolitis.

Methods: A cross-sectional analytical study was done in department of pediatrics in Dhaka Medical College Hospital during the period of October 2013 to September 2014. Patients age less than 5yr presented with cough and respiratory distress were enrolled in this study. But who was previously diagnosed as protein energy malnutrition, cerebral palsy, congenital heart disease, septicemia and severe anaemia were excluded. In this study sampling method was non probability convenience sampling.

Detailed history and clinical examination were carried out and clinical finding were noted. X-ray chest was done to support the diagnosis. In this study pneumonia was diagnosed when a patient presented with fever, cough and breathing difficulty and found fast breathing, chest indrawing and bronchial breath sound or crepitation on examination and consolidation or patchy opacity in chest X-ray. Bronchiolitis was diagnosed when patients less than 2yr presented with cough, breathing difficulty,runny nose and found fast breathing and ronchi on physical examination and hyperlucent or hyperinfated lung field on X-ray chest. After diagnosis treatment was started. Cases of pneumonia were treated with standard protocol of WHO, and cases of bronchiolitis were treated with bronchodilator nebulization. Then regular follow up was given upto 8 days by monitoring cough, runny nose, breathing difficulty, feeding difficulty, social smile, nasal blockade,nasal flaring, chest indrawing, cyanosis, temperature, heart rate, respiratory rate, breath sound and added sound.The main outcome variables were length of hospitalization and disease status of the patients at the time of discharge. All the findings were noted in case collection sheet. After collecting of all information, these data were checked, verified for consistency and edited for final result. After editing and coding the coded data entered into computer by using SPSS (version 16.0) software. Data were presented in tabulated form. Data analyses were done by Chi-square test and Fisher Exact test. Probability value<0.05 was considered as statistically significant.

Result : This study was carried out among enrolled 108 hospitalized children in pediatrics ward of DMCH having clinical features of acute lower respiratory tract infection (pneumonia and bronchiolitis) were studied for sociodemographic , clinical feature and follow up for 7-8 days during admission in hospital.

In present study regarding socio-demographic findings there was no difference in terms of age (p=0.522). Male children are more vulnerable to pneumonia(70.4%) and bronchiolitis(63.0%) than female counterpart (29.6% and 37.0% respectively, p=0.414) The mean weight for children of bronchiolitis(6.8kg) and pneumonia(6.0kg) p=0.082.At the time of data entry cough, breathing difficulty and feeding difficulty were equally presenting feature for both bronchiolitis (100%, 96.3% & 96.3% respectively) and

pneumonia (100%, 100% and 85.2% respectively) [p=undefined, p=0.246, p=.046, respctively]. chest indrawing was similarly uncommon in both bronchiolitis and pneumonia(96.3% vs 92.6%). Fever was more pronounced in pneumonia(100%) than bronchiolitis (77.8%) [p=<0.001]. Runny nose and positive family history of bronchial asthma in bronchiolitis (100% and 29.6% respectively) than pneumonia(40.7% and 3.7% respectively) [p<0.001] History of previous attack of ALRTI is more frequent in bronchiolitis(25.9%) than pneumonia(7.4%)[p=0.009]. Cyanosis, nasal flaring and respiratory rate, impairment of consciousness, restlessness, sleeping difficulty were more prominent in pneumonia than bronchiolitis. [(29.6% vs 14.8%, p=0.046) (77.8% vs 59.3%,p=0.038) (76 vs 66,p,0.001) (33.3% vs 7.4%,p<0.001) (77.8% vs 63%, p=0.092) (92.6% vs 77.8%, p=0.03) respectively].

Follow up findings on day 1 showed runny nose & social smile are more often in bronchiolitis(77.4% &14.8% respectively) than pneumonia(40.7%& 3.7% respectively) p=0.005&p=0.046. Inconsolable cry, sleeping difficulty impairment of consciousness and documented fever were more in pneumonia than bronchiolitis [(29.6% vs 7.4% ,p=0.003) (92.6% vs 77.8%,p=0.03) (37%vs11.1%,p=0.002) (92.6%vs74.1%,p=0.01) respectively]. On follow up findings on day 2 showed runny nosewas further reduced in both groups but it was more in pneumonia(55.6%vs30.8%p=0.01). Return of social smile is much better in bronchiolitis than pneumonia(48.1%vs15.4%,p<0.001). Breathing, feeding and sleeping difficulty significantly improved in bronchiolitis(29.6%,18.5%, 7.4% respectively) than those pneumonia(88.5%, 84.6% & 76.9%) p<0.001. Chest indrawing& nasal flaring reduced significantly in bronchiolitis than those in pneumonia(p<0.001) Consciousness responded better in bronchiolitis group than pneumonia(3.7%vs 23.1%,p=0.003), fever and fast breathing demonastrated their significant reduction in bronchiolitis group than those of pneumonia [(25.9% vs 96.2%. p<0.001) (63.0% vs 88.5%, p=0.002)

On 3rd day 2 cases of pneumonia expired and 4 cases were referred to PICU due to deterioration of clinical condition and 48 cases remained in study. And in case of bronchiolitis 6 cases improved and discharged and 2 cases were withdrawn themselves from study by giving discharge on request. Breathing, feeding & sleeping difficulty and restlessness all improved further, but improvement was faster in bronchiolitis group than those of pneumonia [(8.7% vs 45.8%, p<0.001) (4.3%vs 45.8%, p<0.001) (8.7% vs 33.3%,p=0.004)(16.7%vs4.3%,p=0.053)] In bronchiolitis group chest indrawing reduced to great extent than pneumonia (8.7% vs 70.8%, p<0.001) and nasal flaring and fever and resolved completely in case of bronchiolitis which in pneumonia group were prevailing in significant proportion of cases . (p=0.001 and p< 0.001).Fast breathing in bronchiolitis group reduced to 30.4% as compared 58.3% in pneumonia group(p=0.007) on 4th day 2 cases of pneumonia &28 cases of bronchiolitis were improved and discharged remaining 46 &18 cases respectively. Breathing difficulty, feeding difficulty, inconsolable cry, chest indrawing and nasal flaring all are completely resolved in bronchiolitis but persisted in pneumonia. (17.4%, 21.7%, 4.3% respectively). Social smile returned to all cases of bronchiolitis but only 30% of pneumonia. In pneumonia chest indrawing 30.4% cases, fever and fast breathing in 47.8% of cases. On 5th day all cases of bronchiolitis discharged and cases of pneumonia were followed up upto day 8.

Pneumonia cases were discharged gradually on subsequent days. But 6 cases did not improve and treatment continued upto day 10 to 12.

The average length of hospitalization in case of pneumonia is 5.8 days and in case of bronchiolitis 3.2 days $p<0.001$.

Though the mean hospital stay of pneumonia is 5.8 days. Most of the cases were discharged between day 6 to day 8.The mean is reduced because cases those were referred or died were stayed shorter period in hospital.

Conclusion: It is to be concluded that recovery from clinical features of bronchiolitis were faster than those of pneumonia. Recovery of bronchiolitis was earlier than the pneumonia cases. The length hospital stray was shorter in brochiolitis than the pneumonia cases.

PRACTICE OF NATIONAL GUIDELINE IN MANAGEMENT OF ACUTE BRONCHIOLITIS IN A TERTIARY CARE HOSPITAL

Nilofar Yasmin, Md. Abid Hossain Mollah

Department of Paediatrics, Dhaka Medical College Hospital, Dhaka

Background: Acute bronchiolitis is a common illness accounting for $500 million annually in hospitalizations. Despite the frequency of bronchiolitis, its diagnosis and management is variable. To address this variability, the national guidelines: asthma, bronchiolitis, COPD was developed in 2005 by Bangladesh asthma association.

Objective: To observe whether physicians are diagnosing and treating bronchiolitis according to national guideline.

Study design: Observational study.

Study setting and period: Dhaka Medical College and Hospital (April 2014-April 2015).

Participants: All children of 1 month to 24 months age group who were admitted in DMCH and were diagnosed as acute bronchiolitis were enrolled in the study.

Methods: After including bronchilitis patients the diagnosis and management given by the physicians (Either Interns or Honorary medical officer or assistant Registrar or Registrar) to the child at the time of initial admission were documented from hospital documents. Attendant (preferably mother) were interviewed to find out whether counseling was done. It was noted whether it was in favor of bronchiolitis or not.

Results: Among the 50 patients who were finally analyzed it was found that chest X ray was done in all the patients (100%).Invasive procedures like complete blood count and C reactive protein was done in 16 (32%) patients and 4 (8%) patients respectively. All the children (100%) were treated with parenteral antibiotics, oxygen inhalation and nebulized bronchodilator. 46 (96%) cases was given iv fluid to maintain hydration. Oral corticosteroid was used in 3 (6%) of patients. In 2 (4%) patients oropharyngeal suction was given. In one case NG tube feeding was given. Most commonly used antibiotic was ceftriaxone 52%.Ampicillin and gentamycin in combination was used in 18 (36%) cases. Only 2 (4%) patients were counseled.

Conclusion: In evaluation and diagnosis of bronchiolitis guideline is more or less followed but in treatment there is a wide variation from guideline.

RESPIRATORY DISORDERS IN UNDER-FIVE CHILDREN ATTENDING DIFFERENT HOSPITALS OF BANGLADESH: A CROSS SECTIONAL SURVEY

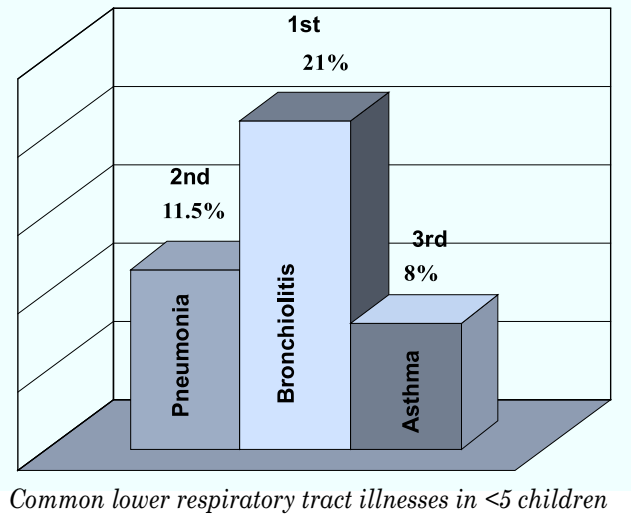
ARM Luthful Kabir[1], Md Ruhul Amin[2], Md Abid Hossain Mollah[3], Selina Khanam[4], Al Amin Mridha[5], Sakil Ahmed[5], Khondoker Rokonuddin[2], Mohammod Jobayer Chisti[6]

Institute of Child and Mother Health (ICMH), Dhaka

Research motivation: There is a lack of global nationwide data on magnitude of different acute respiratory disorders in under-5 children attending different hospitals, although, overall, these are the leading causes of morbidity and mortality in developing countries. Thus, we sought to evaluate the magnitude, validity of clinical diagnosis of respiratory disorders, and commonly prescribed medications by local doctors in under-five children attending different hospitals of Bangladesh.

Methodology: This cross sectional study was conducted in forty three hospitals which were randomly selected from all six divisions of Bangladesh. We enrolled all children who either visited outpatient department (OPD) or hospitalized in in-patient department (IPD) of the respective hospitals on a defined day of visiting the hospitals. Data were collected by previously trained clinicians in a pre-tested questionnaire to attain the objectives.

Main findings: Among a total of 5157 surveyed children 3484 (67%) had respiratory problems. Common cold, bronchiolitis, pneumonia, and asthma diagnosed by the trained research clinicians were 1659 (48%), 744 (21%), 402 (11.5%), and 277 (8%) respectively. The sensitivity and specificity of bronchiolitis, pneumonia, and asthma diagnosed by the local doctors were 15% and 99%, pneumonia 73% and 90% and asthma 10% and 100% respectively. The use of oxygen, salbutamol nebulisation, oral antibiotics, parenteral antibiotics, antihistamine, oral bronchiodilator and oral paracetamol prescribed by the doctors was 10%, 15%, 79%, 16%, 38%, 58%, and 42% respectively were for the management of the children with respiratory problems. The local doctors used to follow Integrated Management of Childhood Illness (IMCI) guideline in diagnosing and managing childhood respiratory disorders.



Common lower respiratory tract illnesses in <5 children

Implications: The results underscore the importance of modification of IMCI guideline in order to prevent the irrational use of antibiotics and antihistamines in managing such children.

Chattagram Maa-O-Shishu Hospital Medical College Journal 2015; 14(1): 6-10

AUDIT ON THE MANAGEMENT OF BRONCHIOLITIS: A SINGLE CENTRE REAL WORLD EXPERIENCE IN BANGLADESH CAN WE DO BETTER ?

Farzana Hamid[1], Syed Moosa MA Quaium[1], Azizur Rahman[1], A T Reza Ahmad[1], Shahariar Khan[1], Tania Hussain[1], Fatematuz Zahra[1]

Department of Paediatrics North East Medical College Sylhet, Bangladesh

Background: Bronchiolitis is the most common reason for hospitalization of children in many countries.Though Respiratory Syncytial Virus (RSV) is the most common organism causing bronchiolitis, but antibiotics are used widely.So the aim of the present study is to establish whether antibiotic has any role in bronchiolitis management along with supportive treatment.

Methods: This retrospective study included 100 infants and children between 2-24 months of age admitted with clear cut sign symptoms of bronchiolitis. Patients were divided into Group A (supportive + antibiotic Rx) comprised 72 patients and group B (supportive Rx only) comprised 28 patients. After 3-5 days of hospital stay, clinical responses were evaluated in terms of improvement in symptoms and clinical parameters- respiratory rate, heart rate and oxygen saturation.

Results: Mean age of patients was 6.6 (±5.6) months in Group A and 6.3 (±4.8) months in Group B. Most of the patients in both study groups were male (M: F=1.6:1). All the cases in both groups presented with cough, running nose, and respiratory distress. Fever and feeding difficulty were present in 83.3% & 90.3% in Group A and 82.1% & 89.3% in Group B respectively. Majority of cases were from lower socioeconomic status and lived in urban area. In Group A, after therapy mean respiratory rate 53.7 (±4.3) and oxygen saturation 97.9 (±1.9) had significantly improved in comparison to respiratory rate 65.6 (±4.8) and oxygen saturation 89.7 (±4.4) before therapy (p=.05 in all parameters). No statistical significant difference was observed in the length of hospital stay in two groups.

Conclusion: The study highlighted the importance of supportive treatment in bronchiolitis management. Antibiotics should not be used without clinical and laboratory evidence of bacterial infection. Key words: Bronchiolitis; Respiratory syncytial virus; Adrenaline; Salbutamol; Antibiotic.

COMPARATIVE EFFICACY OF SINGLE DOSE PARENTERAL DEXAMETHASONE ALONG WITH NEBULIZED SALBUTAMOL VERSUS SALBUTAMOL NEBULIZATION ALONE IN INFANTS WITH ACUTE BRONCHIOLITIS; A RANDOMIZED CONTROL TRIAL

Shanjida Sharmim[1], Md. Abid Hossain Mollah[2], AKM Amirul Morshed[3]

[1]FCPS (Paediatrics) Part-II, [2]Professor of Pediatrics, Dhaka Medical College & Hospital, Dhaka, [3]Associate Professor, Department of Pediatric Heamatology and Oncology, Dhaka Medical College & Hospital, Dhaka.

Background: Bronchiolitis is the leading cause of lower respiratory tract infection in infants and young child. It remains a major public health problem throughout the world exerting significant morbidity and mortality. Releiving symptoms are the main aim of management though none of the treatment modalities is specific. Bronchodilators like salbutamol, adrenaline, anti-cholinergic drugs e.g ipratropium bromide and saline nebulization have been used with varying results. Some studies conducted in abroad with combination of injectable dexamethasone with nebulized salbutamol having better outcome in relation to releiving symptoms as well as duration of hospital stay. This study was conducted as there was no study conducted in our country by combination therapy of injectable dexamethasone with nebulized salbutamol in bronchiolitis patient

Objective: To see the comparative efficacy of single dose parenteral dexamethasone along with nebulized salbutamol versus nebulized salbutamol alone in infants with acute bronchiolitis.

Study design and setting: This is a hospital based randomized control trial . The study was carried out in the department of paediatrics, Dhaka Medical College Hospital, Dhaka over a period of 1 year(July 2013 toJune 2014).

Study Method: This randomized control trial included 90 infants with bronchiolitis (any child age 1 month upto 12 months hospitalized due to preceding or existing runny nose, cough, breathing difficulty, chest indrawing, wheeze, ronchi on auscultation). The cases were randomized by simple randomization with lottery into Group-A received single dose dexamethasone injection along with nebulized salbutamol, single dose dexamethasone injection received 15 minutes after 1st salbutamol nebulization (n=30), Group-B received nebulized salbutamol (n=30) and Group-C received only supportive treatment (n=30). After randomization 1st two group received nebulization of salbutamol every day of hospital stay delivered at an interval of 8 hours until the patients severity comes to mild level. Ten minutes after administration of each nebulization, respiratory distress assessment instrument (RDAI) score and oxygen saturation was observed to asses the response to therapy.Follow up was given every day with an interval of 8 hours upto discharge.

Results: Study cases in all the groups presented with cough (100%), respiratory distress (100%), feeding difficulty (82.2%), running nose (80%). Majority of the cases live in urban area and mostly from smoker family. In supportive treatment group respiratory rate, RDAI score and O_2 saturation (at admission RR-58.33;±5.74, RDAI

score-10.07; ±1.78, SpO2 88.53%;±1.65 and 72 hrs after admission RR 37.00;±8.30, RDAI score-4.80; ±1.03, SpO2 98%;±1.07) improved after 72 hrs. In salbutamol nebulization group respiratory rate, RDAI score and O2 saturation (at admission RR-60; ±6.62, RDAI score-9.47; ±1.81, SpO2 88.33%;±1.70 and 72 hrs after admission RR 31.80;±6.08, RDAIscore-3.76;±.85,SpO2 99%;±1.06) significantly improved after 72 hrs of admission. In salbutamol nebulization with single dose intramuscular dexamethasone injection group respiratory rate, RDAI score and O2 saturation (at admission RR-59.73; ±6.71, RDAI score-9.97; ±1.80 and SpO2 87.96%; ±1.27 and after 72 hrs of admission RR-28.90; ±5.23 RDAI score-1.56; ±.56 and SpO2-99.93%;±.25) also significantly improved after 72 hrs of admission. Improvement was more significant in salbutamol with single dose intramuscular dexamethasone injection group(p-value was 0.00, 0.00, 0.00 in RR, RDAI score and SpO2 respectively after 72 hrs). Duration of hospital Stay in supportive treatment group was 5.34; ±0.85 days, in salbutamol nebulization group was 5.30; ±0.83 days and in salbutamol nebulization with single dose intramuscular dexamethasone injection group was 3.57; ±0.97 days (p-value <0.05).

Conclusion: The study concluded that both nebulized salbutamol and dexamethasone injection along with nebulized salbutamol are effective and dexamethasone injection along with nebulized salbutamol is significantly superior to nebulized salbutamol alone in infant with bronchiolitis in relieving symptom.

RESPIRATORY MORBIDITY AMONG INFANT: A LONGITUDINAL STUDY

Rahat Bin Habib[1], ARM Luthful Kabir[2]

[1]Institute of Child and Mother Health (ICMH), [2]Sir Salimullah Medical College (SSMC), Dhaka

Background: Mortality and morbidity among children within the first year of life is an important indicator of the health status of a population. In Bangladesh there are many studies for childhood illness, these are all cross sectional studies. Whereas there are very few longitudinal studies or long term prospective study for childhood respiratory morbidity in our country or abroad, this is very important to determine the health status or disease pattern of children.

Objective: This is a longitudinal study during infantile period to identify the frequency, magnitude and pattern of respiratory morbidity among the same group of respondents.

Methodology: In this study there were 308 infants, enrolled on the day of birth in ICMH, from the 1st July'14 to 31st August'14. These newborns were followed by monthly and also at the time of illness, telecommunication on 24 hours in each day. On the 31st August'15, distinct 12 months have completed.

Result: Among them male predominant 171 (56%) then female (44%), there 226 (73%) born by Cesarian Section (C/S), 70 (23%) by Normal Vaginal Delivery (NVD), their mean birth weight was 2903±400 grams, birth length was 48±2.70 cm, OFC was 33±1.80 cm, breast fed within 01 hour 159 (51%) neonate.

Socio demographically average mothers and fathers age was 24±4 and 34±6 years, fathers and mothers education was near to equal (10±4 and 9±3) years at 95% Cl, father's occupation 101 (33%) were on private service, 85 (28%) were on business, abroad on 37 (12%) and only 5% were cultivators. In occupation 256 (83%) mothers were house wives. Minimum monthly income was 5000 taka and maximum was 1 lac taka and mode was 10000 taka. 75 (24%) fathers said they are smoker. 68% were nuclear families and 32% live in joint families. Their sibs number 2±1 and family members 6±3. Most (73%) live in ground level (among them 53% live in tin shed house) and 24% live in 1st floor or above. All are muslims other then 04% (hindus). 19 (06%) parents are consanguineous.

Among 308 study population 228 (74%) parents maintained communication upto completion of 12 months, there 61 (20%) visited for regular anthropometric measurement with follow up, 167 (54%) connected by regular telecommunication. Here 80 (26%) were dropped out.

On disease prevalence, 98% suffered from URTI and remaining (02%) LRTI, bronchiolitis were 40 (85%) cases and bronchopneumonia 07 (15%) cases. On average each infant suffered by 10 attacks of RTI in a year, it indicate nearly 01 attack in a month. Therefore, 60% children suffered repeated RTI in a month, which 42% were 2

times and 18% were ≥2 times in each month, 100% children suffered from common cold and cough. 54% parents complained about repeated vomiting (probably GER). 16 babies suffered from ASOM, in which 04 of them suffered >1 times. 13% infants suffered by measles and development of rash without fever 02% of them. There was no tonsillitis of 100% children. EBF 141 (62%) of infants.

Conclusion: This study shows that prevalence of URTI is more common then LRTI and in LRTI bronchiolitis is more common then bronchopneumonia in our society.

UPDATES ON THE MANAGEMENT OF BRONCHIOLITIS

ARM Luthful Kabir, Md. Abid Hossain Mollah, Md. Ruhul Amin

Summary

Definition: Bronchiolitis is a clinical condition characterized by runny nose followed by respiratory distress associated with wheeze in a child below 2 years of age.

Epidemiology: Bronchiolitis is the leading cause of hospitalization for infants younger than one year of age. Admissions for bronchiolitis have increased over the last decade and it has been associated with increasing morbidity and cost. It is the most common cause of lower respiratory tract infection (21%) as against pneumonia (8%).

Risk factors: Important risk factors include prematurity, male sex, overcrowding, non-breast feeding etc.

Etiologic agents: Respiratory syncytial virus (RSV) and human metapneumovirus (hMPV) are two important causes of bronchiolitis.

Pathlology: RSV causes epithelial cell necrosis, ciliary destruction of respiratory epithelial cells, and inflammatory edema of the bronchioles resulting in mucus plug formation causing bronchiolar obstruction leading to air trapping and varying degrees of lobular collapse. These mechanisms cause ventilation perfusion mismatch and ultimately hypoxemia.

Clinical features: Important features are cough, runny nose, feeding difficulty, fast breathing, respiratory distress, bloated chest, chest indrawing, wheeze and hypoxemia as reflected by pulse oximetry.

Investigations: There are no laboratory tests that are specific to bronchiolitis and as such no single laboratory test can confirm or rule out acute viral bronchiolitis. Laboratory testing for nasopharyngeal aspirate (NPA) for bronchiolitis-related viruses can support patients' diagnosis. Important chest radiographical features are hyperinflation, increased translucency, increased interstitial markings and focal atelectasis.

Treatment: The cornerstone of bronchiolitis treatment remains supportive care and counseling. There is great variability in the clinical approach to treatment and there is much confusion and controversy regarding the treatment of bronchiolitis. Important modalities of treatment are managing at home, nasal suctioning, fluid and hydration therapy, supplemental oxygen, nebulised hypertonic saline (3%) as mucolytic, ventilatroy support with nasal CPAP in case of respiratory failure and inhaled ribavirin for severely ill or high risk infants with bronchiolitis. Prevention include hand hygiene with antimicrobial soap or an alcohol based rub, exclusive breast feeding for 6 months, and passive immunization with Palivizumab for infants at high risk for developing severe bronchiolitis.

Counseling should highlight that bronchiolitis has very high degree of morbidity and low mortality (1%). There is significantly lower risk of serious bacterial infection in case of RSV bronchiolitis. Long term sequelae include development of wheezing or asthma in later life, allergic sensitization and bronchiolitis obliterans.

Definition

Bronchiolitis is a clinical condition characterized by runny nose followed by respiratory distress associatred with wheeze. Most definitions of bronchiolitis limit the affected age group to younger than 2 years of age, with some limiting it even further to 12 months of age. American Academy of Pediatrics (AAP) Clinical Practice Guideline defines bronchiolitis as "a constellation of clinical symptoms and signs including a viral upper respiratory prodrome followed by increased respiratory effort and wheezing in children less than two years of age".

Epidemiology

Bronchiolitis is the leading cause of hospitalization for infants younger than one year of age. Admissions for bronchiolitis have increased over the last decade and it has been associated with increasing morbidity and cost. In a recent study, among a total of 5157 surveyed children 3484 (67%) had respiratory problems. Common cold, bronchiolitis, pneumonia, and asthma diagnosed by the trained research clinicians were 1659 (48%), 744 (21%), 402 (11.5%), and 277 (8%) respectively. The age for peak incidence of respiratory syncytial virus (RSV) is between 2 and 6 months of age. The incidence peaks during winter and early spring. In tropical countries, occurrences of RSV bronchiolitis tends to coincide with rainy season.

Risk factors

- Prematurity
- Male sex
- Lower socioeconomic family
- Overcrowding
- Non breast feeding
- Passive smoking
- Wood burning stoves

Etiologic agents

Respiratory syncytial virus (RSV) is the predominant etiologic agent for acute viral bronchiolitis and 50% to 80% of cases are attributed to this virus. Other viruses include rhinovirus, adenovirus, corona virus, enterovirus, parainfluenza virus type 3, influenza, human bocavirus (hBoV) and human metapneumovirus (hMPV) which is now considered the second most common cause of bronchiolitis after RSV. Mycoplasma pneumoniae is also reported to cause bronchiolitis in children.

Pathlology

RSV, the most common infecting virus in bronchiolitis binds to toll like receptor on epithelial cells, fuses its membrane with the cell membrane, replicates, causing epitjelial cell necrosis and ciliary destruction. This cell destruction triggers an inflammatory response, and infiltration of the submucosa with both neutrophils and lymphocytes. Thick mucus plugs are created by increased mucus secretion from goblet

cells combining with desquamated epithelial cells. This mucus plugs result in bronchiolar obstruction, leading to air-trapping and varying degrees of lobular collapse. This mechanisms cause ventilation perfusion mismatch and ultimately hypoxemia.

Clinical features

Symptoms	Signs
- Cough - Runny nose - Nasal blockade - Cough with vomiting - Breathing difficulty - Feeding difficulty - Sleeping difficulty - Restlessness - Inconsolable cry - Hoarse voice - No social smile - Cyanosis - Impaired consciousness - Convulsion	- Wheeze - Bloated chest - Chest indrawing - Nasal flaring - Intercostal recession - Fever (low grade) - Tachypnea - Tachycardia - Hyperresonance on percussion - Rhonchi - Crerpitation - Palpable liver and spleen - Hypoxemia (SpO2 <90%) - Grunting - URTI features-conjunctivitis, pharyngitis, otitis media - Apnea - Respiratory failure - Dehydration

Investigation

- There are no laboratory tests that are specific to bronchiolitis and such no single laboratory test can confirm or rule out the acute viral bronchiolitis
- Testing nasopharyngeal aspirate (NPA) for viruses
- A blood gas (capillary, venous and capillary) can aid with assessment of gas exchange and acidosis
- Plasma BUN, creatinine and electrolytes to assess dehydration
- WBC count can range from 5000/cmm to 24000/cmm.
- Chest radiography : Important features are hyperinflation, increased translucency, increased interstitial markings, focal atelectasis, dirty lungs (combination of increased interstitial markings and focal atelectasis) and atelectasis of right upper lobe.
- Currently, there is no evidence to support the routine use of radiographs in a child with typical bronchiolitis.

Treatment

Admission criteria (no clear cut criteria)

- Tachypnea (RR 60-70 breath/ min)
- Feeding difficulty
- SpO2 <90%
- Apnea
- Lethargic
- Dehydrated
- With influencing disposition determination (prematurity, very young, congenital heart disease, preexisting pulmonary problem like BPD, immunodeficiency, neuromuscular disorder)

The cornerstone of bronchiolitis treatment remains supportive care. There is great variability in the clinical approach to treatment and there is much confusion and controversy regarding the treatment of bronchiolitis.

Fluid and hydration therapy

- Breast feeding when infant can breastfeed
- Nasogastric tube feeding when food intake is decreased
- Intravenous fluid therapy when respiratory rate exceeds to 60 to 70 per minute

Supplemental oxygen

- There is no clear direction as to what constitutes a safe admission or discharge hemoglobin oxygen saturation.
- The AAP recommends supplemental oxygen if the hemoglobin oxygen saturation is persistently below 90%.
- Premature or LBW infants, as well as those with chronic lung disease or congenital heart disease may require further consideration when administering or discontinuning oxygen, as these children are likely to have lower tolerance for hypoxemia and a higher likelihood of severe disease.

Nasal suctioning

The younger age precludes effective self-clearing of the nasal passages, so nasal suctioning is commonly used both at home and in the hospital setting.

Salbutamol/ Aluterol

- Bronchodilators are commonly used in the management of bronchiolitis but the evidences to support this practice is not very strong.
- It appears that bronchodilators have a greater effect in the outpatient setting rather than in the hospital setting.
- There is a statistically significant and clinically modest improvement in the overall average clinical score of patients treated with bronchjodilators but no improvement in oxygen saturation, hospitalization rate and length of stay (LOS) in the hospital.
- The AAP has recommended that bronchodilators should not be routinely used in the management of bronchiolitis and it might be appropriate for clinic and non-hospital setting

Nebulized epinephrine

- Outpatient studies demonstrated short-term improvement in clinical scores, oxygenation, respiratory rate and overall improvement of the patient.
- It appears to have a slightly greater effect than β_2 agonist.
- AAP has recommended that nebulized adrenaline should not be routinely used in the management of bronchiolitis
- Epinephrine is not available for use in home setting

Mucolytics

- Mucus plugging plays a significant role in the small airway obstruction of bronchioles. Muclolytics are supposed to thin the secretions thereby improve clinical outcome.
- Nebulized hypertonic saline is thought to improve mucociliary clearance by causing osmotic movement of water into airways.
- Patients treated with 3% hypertonic saline had a significantly shorter mean length of hospital stay and improved clinical severity score compared to those who received nenulized normal saline
- The effects of hypertonic saline are not seen immediately, so is is suggested to begin early
- Another mucolytics, deoxyribonuclease (DNase) has not been found to have any effect on length of stay, clinical severity score or duration of oxygen therapy

Corticosteroids

- The use of corticosteroids via inhalation or systematically (oral, IM or IV) in bronchiolitis is controversial
- The use of systemic corticosteroid did not demonstrate a benefit in terms of rate of OPD visits and LOS in hospitals
- A synergistic effect could be demonstrated when combining nebulised epinephrine and oral corticosteroids in terms of hospital admission, LOS and clinical scores.
- Currently, there is no evidence to support the use of inhaled corticosteroids for acute or long-term benefit in bronchiolitis.

Antivirals

Ribavirin is an inhaled broad spectrum anti-viral agent that is sometimes used in the treatment of severely ill or high-risk infants with bronchiolitis. Routine use of ribavirin is not recommended for children with bronchiolitis, as studies are limited, the drug is difficult to administer, and is potentially toxic.

Antimicrobials

- Though bronchiolitis is a viral illness, antimicrobials are tended to be prescribed considering high fever, young age and concerns for bacterial superinfection.
- A moderate sized study (n=295) of antimicrobial use in infants with bronchiolitis demonstrated that there was no clinical advantage to using antimicrobials in the care of such children. The authors concluded that supportive measures without antimicrobials remained the standard of care in the hospital setting. Given the results of this study and the low rates of serious bacterial co-infection in children with bronchiolitis, the routine use ofantimicrobials can not be recommended.
- Clarithromycin in bronchiolitis may have a significant effect on length of stay, use of β_2 agonist and plasma levels of inflammatory markers.

Ventilatory support

- When supportive care fails to lead to improvement in the clinical status of a child with moderate to severe respiratory distress, and respiratory exhaustion or failure is imminent, assisted ventilation is the next step. Endotracheal intubation and mechanical ventilation is the time honored intervention.
- Considering the risks and complications of mechanical ventilation, a less invasive alternative to ventilation, nasal continuous positive airway pressure (nCPAP) is preferred to use early by the clinicians and researchers.

Prevention

- Hand hygiene: with antimicrobial soaps or an alcohol based rub
- Exclusive breast feeding for 6 months
- Palivizumab, a humanized monoclonal antibody, is currently recommended for high risk infants for severe bronchiolitis. It is recommended as a monthly IM injection over the five peak months of RSV season. It is quite expensive.

Disease course and complications

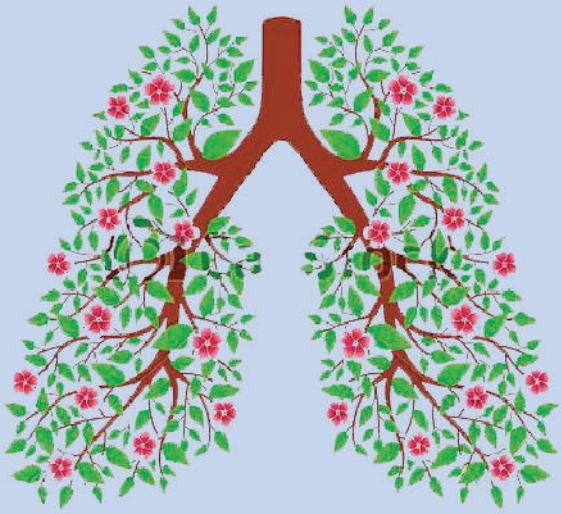
- A disease with very high morbidity and low mortality (1%)
- The mean duration of illness is 15 days
- The mean duration of hospitalization is 4 days, but prolonged with underlying cardiac or chronic lung conditions
- Concomitant otitis media is common but serious bacterial infection (SBI) is unlikely, except UTI
- May be associated with SIADH
- A variety of cardiac manifestations may occur like myocarditis, arrhythmia, heart block, sepsis-like syndrome

Long term sequelae

- Development of wheezing or asthma later in life
- Allergic sensitization
- Bronchiolitis obliterans

References

1. Ali S, Plint AC, Klassen TP. Bronchiolitis. In: Kendig andChernick's Disorders of the RespiratoryTtract in Children. Wilmott RW, Boat TF, Bush A, Chernick V, Deterding RR, Ratjen F. Eighth eds, Philadelphia. 2012; 443-452
2. http://pediatrics.aappublications.org/content/134/5/e1474.full.pdfand Management of Bronchiolitis," published by the American Academy of Pediatrics in PEDIATRICS Volume 134, Number 5, November 2014 e1475.
3. Kabir ARML, Mollah AH, Amin R, Management of bronchiolitis without antibiotics-A multicentre RCT in Bangladesh. Acta Pediatrica 2009; 98(10): 1593-1599.



ফুসফুস একটি উল্টানো গাছ যা আমাদের বুকে অবস্থিত। ফুসফুসের কাজ হলো আমাদের শরীরে অক্সিজেন সরবরাহ করা এবং কার্বনডাই অক্সাইড বের করে দেওয়া। গাছের শাখা প্রশাখা শেষ হয় পাতার মত অংশে। পাতায় প্রদাহ হলে নিউমোনিয়া হয় এবং পাতার বোটায় ভাইরাস জনিত প্রদাহ হলে বলে ব্রংকিউলাইটিস। ছোট্ট (২ বছর পর্যন্ত) শিশুদের নাক দিয়ে পানি পড়ার পর কাশি, দ্রুত শ্বাস, শ্বাসকষ্ট ও বুকে বাঁশির মতো আওয়াজ হয়। জ্বরের মাত্রা বেশী থাকে না। রক্তে অক্সিজেনের মাত্রা কমে গেলে অক্সিজেন দিয়ে চিকিৎসা করতে হয়, এন্টিবায়োটিকের প্রয়োজন নেই। শিশু দ্রুত সুস্থ হয় এবং হাসতে থাকে। তাই হাসি, কাশি ও বুকের বাঁশিই ব্রংকিউলাইটিস। ব্রংকিউলাইটিস বারে বারে হতে পারে এবং পরবর্তীতে শিশু হাঁপানি রোগেও আক্রান্ত হতে পারে।