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Original Article

Role of Antibiotic in Treatment of Bronchiolitis

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Abstract

Background: Acute bronchiolitis is a viral respiratory illness of infants and young children. It is characterized by coryzal symptoms followed by rapid onset of cough, wheeze, fever, tachypnea, chest recession and crepitation with radiological evidence of hyperinflation. Bronchiolitis occurs in first 2 years of age and is usually caused by respiratory syncytial virus.

Objective: To find out the effectiveness of antibiotic in treatment of bronchiolitis.

Methods: It was a randomized controlled trial carried out in Department of Paediatrics, Rajshahi Medical College Hospital, Rajshahi. 200 acute bronchiohtis patient admitted into paediatric ward of Rajshahi Medical College Hospital who fulfill inclusion criteria. Then relevant history and physical examination findings were recorded in data sheet. The even numbered patient was selected as control group and odd numbered patients as intervention group. The control group was receive supportive management and intervention group was receive Inj. Ceftriaxone 75mg/kg/day in for 5 days along with supportive management.

Results: This study it was observed that bronchiolitis was more common in male. The age for peak incidence (75%) of bronchiolitis was 2-6 months. About 59% children presented with fever and all of them recovered from fever quickly before leaving hospital. At the time of admission 43% children had feeding difficulty, which improved steadily and similarly in both the groups. For days hours after admission 16% of antibiotic group and 15% of without antibiotic group had similar chest indrawing. Cough was the most common starting symptoms. None of the cases showed cyanosis and at the time of admission total 91% children had SpO2 <95%, after 4 days of admission 33%of antibiotic group and 14% of without antibiotic group still had SpO2 <95% but during discharge none of them had hypoxia. After 4 days of admission 17% of antibiotic group and 14% of without antibiotic group had crepitation and 6 days after discharge 1(1%) child of without antibiotic group and 2(2%) from antibiotic group still had crepitation. It was observed that hypertranslucency in 74% and hyperinflation in 64% in cases.

Conclusion: This study shows antibiotics have no role in acute bronchiolitis management. Further multicenter study with larger sample size is recommended.

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Introduction

Acute bronchiolits is one of the common serious acute lower respiratory infection in infants resulting in inflammatory obstruction of the small airways.[1-2] Bronchiolitis is seasonal, with peak activity during winter and early spring.[1] Most of the children (83%) are below 6 months age having the modal age of 3 months.[3-4] Acute bronchiolitis

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is predominantly a viral disease. RSV is responsible for >50% cases. Other agents include para influenza, adenovirus, mycoplasma , human metapneumo virus and human boca virus. The diagnosis of acute bronchiolitis is clinical, particularly in a previously healthy infant presenting with a first-time wheezing episode during a community outbreak.[1] Supportive interventions remain the mainstay of management.[5] Supportive interventions include cool humidified oxygen, maintaining optimum body position, nutritional management, frequent suctioning of nasal and oral secretions.[1] Other management of bronchiolitis include inhaled epnephrine, bronthodilators, steroids, anticholinergics, hypertonic saline, surfactant and chest physiotherapy.[6-12] There is no need of antibiotic therapy in all cases of bronchiolitis. Antibiotic therapy is indicated in case of high fever, raised white cell count (>15,000Icmm) and lobar infiltration on chest Xray.[13] Bangladesh is a developing country and infectious diseases are very common in our country. So the use of antibiotic should be rational to avoid the hazard of injudicious use of antibiotic.In this study were select patients of bronchiolitis based on inclusion and exclusion criteria. Then they were enrolled into control and intervention group. Control group were be treated with supportive management according to national guideline for management of bronchiolitis[14] and intervention group was treated with intravenous injection ceftriaxone 75mg/ kg/day for 5 days along with supportive management. By analyzing collected data we were evaluate the effectiveness of antibiotic in treatment of bronchiolitis.

Objective

General

- To find out the effectiveness of antibiotic in treatment of bronchiolitis.

Specific

- To find out the time of resolution of respiratory distress, fever, rhonchi, crepitation, improvement in oxygen saturation without antibiotic.
- To find out the time of resolution of respiratory distress, fever, rhonchi, crepitation, improvement in oxygen saturation with antibiotic.
- To find out the length of hospital stay without antibiotic.
- To find out the length of hospital stay with antibiotic.
- To compare efficacy of both treatment.

Materials & Methods

Study design

It was a randomized controlled trial.

Place of study

Department of Paediatrics, Rajshahi Medical College Hospital, Rajshahi.

Study period

From May 2014 to October 2014.

Procedures of collecting data

Patients were selected according to inclusion criteria from admitted bronchiolitis patients in pediatrics wards of Rajshahi Medical College Hospital. Preformed data sheets were numbered chronologically from 1 to 200 as the sample size is 200. These preformed data sheets were attached with admission form of selected bronchiolitis patient chronologically according to their admission date and time. Then relevant history and physical examination findings were recorded in data sheet. The even numbered patient was selected as control group and odd numbered patients as intervention group. Nutritional Status of patients were matched among the selected cases of bronchiolitis. The control group was receive supportive management and intervention group was receive lnj. Ceftriaxone 75mg/kg/day in for 5 days along with supportive management. They was followed up 3 times in 24 hours for 7 days with a structured follow up sheet. Patient was discharged if feeding adequately, no respiratory distress and no requirement of 02 therapy. Date of discharge were recorded for assessing length of hospital stay.

Inclusion criteria:

- Patients admitted with clinical features suggestive of acute bronchiolitis (Runny nose followed by cough and respiratory distress in a previously healthy children)[4]
- Age 2 month to 2 yrs.

Exclusion criteria:

- Patients having clinical, laboratory or radiological evidence of bronchopneumonia or secondary bacterial infection.
- Patients having congenital heart disease.
- Previous repeated attack of cough and wheezing or asthma.

Results

Table : I. Duration of the hospitalization in the study subject

Duration of hospitalization (days)	With antibiotic (Intervention) (n=100)		Without antibiotic (Control) (n=100)		P value
	No	%	No	%	
1-3	66	66	83	83	
>3	34	34	17	17	0.111
Mean±SD	3.43±1.18		3.18±1.01		

Table II : Temperature of the study subject

Day	Temperature	With antibiotic (Intervention) (n=100)		Without antibiotic (Control) (n=100)		P value
		No	%	No	%	
Day 1	98	75	75	67	67	
	99	25	25	17	17	0.001
	100-102	0	0	16	16	
Day 2	98	92	92	92	92	
	99	0	00	0	00	0.100
	100-102	8	8	8	8	
Day 3	98	100	10	83	83	
	99	0	00	0	00	0.001
	100-102	8	8	17	17	
Day 4	98	98	98	86	86	
	99	0	00	0	00	0.001
	100-102	2	2	16	14	

Table III: Other sign of bronchiolitis (day 4)

Complain	With antibiotic (Intervention) (n=100)		Without antibiotic (Control) (n=100)		P value
	No	%	No	%	
Rhonchi	38	38	31	31	0.441
Crepitation	17	17	14	14	0.558

Table IV: Chest indrawing of the study subject

Day	With antibiotic (Intervention) (n=100)		Without antibiotic (Control) (n=100)		P value
	No	%	No	%	
Day 1	100	100	100	100	0.100
Day 2	100	100	100	100	0.100
Day 3	66	66	50	50	0.001
Normal	8	8	10	10	0.556

Table IV: Mean oxygen saturation between two groups

Day	With antibiotic (Intervention) (n=100)	Without antibiotic (Control) (n=100)	P value
Day 1	92.78±1.17	92.65±0.94	0.391
Day 2	93.18±1.05	93.73±1.53	0.114
Day 3	94.01±1.56	94.23±0.94	0.719
Day 4	94.43 ±1.47	95.18±1.02	0.004

Discussion

This randomized control trial provided us the opportunity to find out the effectiveness of antibiotic in treatment of bronchiolitis in a hospital setting. All children were between 2 month to 2 years old. In this study 75% of children were aged

below six months and majority of them were male which is in conformity with observations allover the world.[15-17] About 59% children presented with fever and all of them recovered from fever quickly before leaving hospital (p>0.5). Similar finding was noticed by Radhi et al.[18] Another presenting feature was feeding difficulty. At the time of admission 43% children had feeding difficulty, which improved steadily and similarly in both the groups (p>0.5). Most of the children chest indrawing (100%) at the time of admission. Four days after admission 16% of antibiotic group and 15% of without antibiotic group had similar chest indrawing (p>0.5). Cough was the most common starting symptoms in our series. In this study none of the cases showed cyanosis and at the time of admission total 91% children had SpO2 <95%, after 4 days of admission 33%of antibiotic group and 14% of without antibiotic group still had SpO2 <95% but during discharge none of them had hypoxia. The difference between the two groups was not statistically significant. This finding matches with other`s findings.[19,20,21] On the day of admission 100% children had rhonchi, after 4 day, about one-third of the total children had rhonchi; 36% of antibiotic group and 31% of without antibiotic group (p>0.5). After 4 days of admission 17% of antibiotic group and 14% of without antibiotic group had crepitation and 6 days after discharge 1(1%) child of without antibiotic group and 2(2%) from antibiotic group still had crepitation, but the difference was not statistically significant. There was no fatality in this study as shown in other studies.[22,23] Deterioration in AB group was less but hospital stay was longer and statistically there was no significant difference when compared with NAB group. Few randomized control studies conducted so far on use of antibiotic in bronchiolitis, also found no evidence to support the use of antibiotics for bronchiolitis.[19,20,24,25] The cardinal radiological features of bronchiolitis are hyperinflation of the lung fields, increase interstitial markings and streaky opacities. Our experience is same, hypertranslucency in 74% and hyperinflation in 64% in cases. In this study, pulmonary infiltration in the form of streaky densities 14%. It is consistent with other study.

Though the management of bronchiolitis was traditionaly done by injectable antibiotic, oxygen, salbutamol nebuliser, paracetamol for high fever, normal saline nose drop, IV fluid, NG feeding (In selected case). IV fluid therapy is required in cases with severe respiratory distress where oral feeding is fraught with hazards of aspiration. In this study we used antibiotic (Inj. Ceftriaxone 75 gm/kg/day and I/V for 5 days) keeping all other modalities same as traditional practice. This result showed no significant difference in antibiotic and no antibiotic group. In this study 2 cases left hospital on DORB in antibiotic group and 3 cases were shifted from no antibiotic to antibiotic group for persistence of breathing difficulty and crepitation in the lung. There was no mortality.

Conclusion

This study shows antibiotics have no role in acute bronchiolitis management. Mean hospital stay of antibiotic group was little longer than without antibiotic group but the difference of outcome between the two groups was not statistically significant.

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