

Research Article

A COMPARATIVE STUDY TO ASSESS THE EFFICACY OF NEBULIZED 3% HYPERTONIC SALINE VERSUS NEBULISED ADRENALINE IN TREATMENT OF ACUTE BRONCHIOLITIS

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ABSTRACT

Acute bronchiolitis is one of the most common respiratory illnesses affecting children in the age group 1 month to 2 years (Klassen, 1997). The etiology is almost always viral with respiratory syncytial virus (RSV), parainfluenza, influenza responsible for vast majority of cases (Kabra and Ghai, 2013). Recently, the role of nebulized 3% saline has come into focus, its efficacy being proven above other modalities in various studies (Zhang *et al.*, 2008). Nebulised adrenaline has also been suggested as treatment option 5, its primary role being reduction of mucosal edema, which is an important part of the disease pathology in bronchiolitis. Objective of the study was to compare the efficacy of nebulised 3% saline and nebulised L-adrenaline in treatment of acute bronchiolitis in children 1month to 2years of age. Other objectives were to observe any difference in the duration of hospital stay and duration of illness using each of these treatment options. 1.) This study was conducted for a period of 1 year, 40 clinically diagnosed cases of bronchiolitis were included. Cases were divided into two groups of A and B randomly and were given nebulization with 3% saline (4ml) and adrenaline (0.5ml/kg max of 2.5ml of 1:1000) respectively at 0hrs and continued 4th hrly till hospital stay. Bronchiolitis clinical scoring was done at admission and at discharge, monitoring of clinical signs and vital parameters were done daily. 2) The efficacy of the two treatments were compared in terms of the following parameters: 1. Reduction in respiratory scores compared to baseline in each of the groups. 2. Duration of hospital stay in both groups. **Results:** The duration of illness for 3% saline group was 2.4+/-0.92 and adrenaline group was 2.6+/-1.04. The clinical scores at admission for 3% saline group were [5.95+/-1.76] and adrenaline group was [5.4+/-2.6] but the difference was not statistically significant. The mean duration of the hospital stay was slightly higher in the adrenaline group [4.0+/-2.2 days] when compared to 3% saline group [3.7+/-2.0 days]. P value was <0.05 which was statistically significant. **Conclusion:** It is concluded from our study that nebulized hypertonic 3% saline is a better treatment modality in comparison to nebulized adrenaline in acute bronchiolitis. Children treated with 3% saline showed greater improvement and early hospital discharge.

Keywords: Hypertonic Saline, Adrenaline, 3% Saline vs Nebulised Adrenaline, Acute Bronchiolitis

INTRODUCTION

Acute bronchiolitis is one of the most common respiratory illness affecting children in the age group 1 month to 2 years (Klassen, 1997). The most commonly involved age group is 3-6 months (Kabra and Ghai, 2013). The etiology is always viral with respiratory syncytial virus (RSV), parainfluenza, influenza responsible for vast majority of cases (Kabra and Ghai, 2013). Since the outset, treatment of bronchiolitis consisted of humidified oxygen, with i.v fluids and nutrition. Bronchiolitis is a self limiting disease (Dennis, 2005) and most often no treatment modality seems to work definitively. The response to these options was variable among patients. Recently, the role of nebulized 3% saline has come into focus, its efficacy being proven above other modalities in various studies. Nebulized adrenaline has also been suggested as treatment option. Many studies have been conducted regarding efficacy of adrenaline as well as its comparison to other modalities like bronchodilators and nebulized steroids (Numa *et al.*, 2001). Studies comparing the efficacy of adrenaline with hypertonic saline are lacking, hence, this study is conducted to gather more evidence in regard to this.

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Aims and Objectives

- To study the efficacy of nebulized hypertonic saline versus adrenaline in treatment of bronchiolitis in children aged 1 month to 2 yrs of age.
- To observe any difference in the duration of hospital stay using each of these treatment options.

MATERIALS AND METHODS

This prospective comparative study was conducted on 40 children admitted with acute bronchiolitis in the department of pediatrics from October 2016 to September 2017.

This study was conducted for a period of 1 year, 40 clinically diagnosed cases of bronchiolitis were included. Cases were divided into two groups of A and B randomly and were given nebulization with 3% saline (4ml) and adrenaline (0.5ml/kg max of 2.5ml of 1:1000) respectively at 0hrs and continued 4th hrly till hospital stay. Bronchiolitis clinical scoring was done at admission and at discharge, monitoring of clinical signs and vital parameters were done daily.

Inclusion Criteria

Age group 1 month to 2 yrs with bronchiolitis requiring hospital admission.

Exclusion Criteria

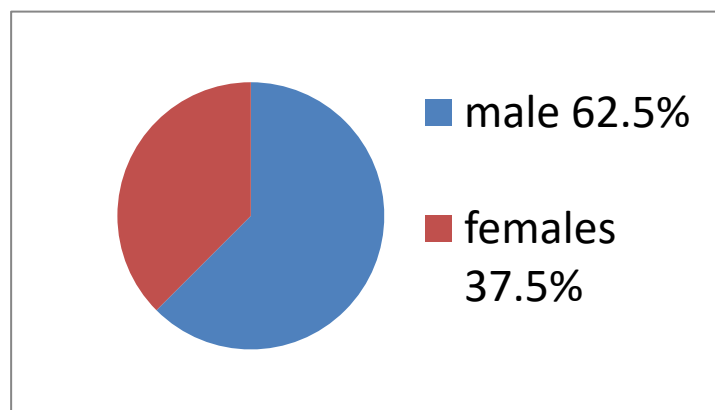
- Children with any other co morbid conditions like, congenital abnormalities of respiratory system and cardiovascular system.
- Evidence of bacterial infection or
- Children who have already received nebulisation with 3% saline or adrenaline.

Table 1: Bronchiolitis Clinical Severity Score (Wang *et al.*, 1992)

	0	1	2	3
Respiratory rate	<30	31-45	46-60	>60
Spo2	≥90%	≥88%	≥86%	≤85%
General Appearance	Calm, no distress	Mildly irritable, easy to console	Moderately irritable, difficult to console	Extremely irritable cannot be comforted
Retractions and nasal flaring (NF, SS, IC, SC)	None	1 Of 4	2 of 4	3 or more
Auscultation	clear	Scattered wheeze	Diffuse expiratory wheeze	Biphasic wheeze/very poor air movements

RESULTS AND DISCUSSION

Results



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Table 2: Gender Distribution

Male	25[62.5]
Female	15[37.5]
M:F ratio	1.6:1

Table 3: Age Distribution of the Studied Patients

Age in Months	Total No [%]
0-6months	20[50]
7-12months	16[40]
>12 months	4[10]
Mean age of presentation	5.93+/-3.383

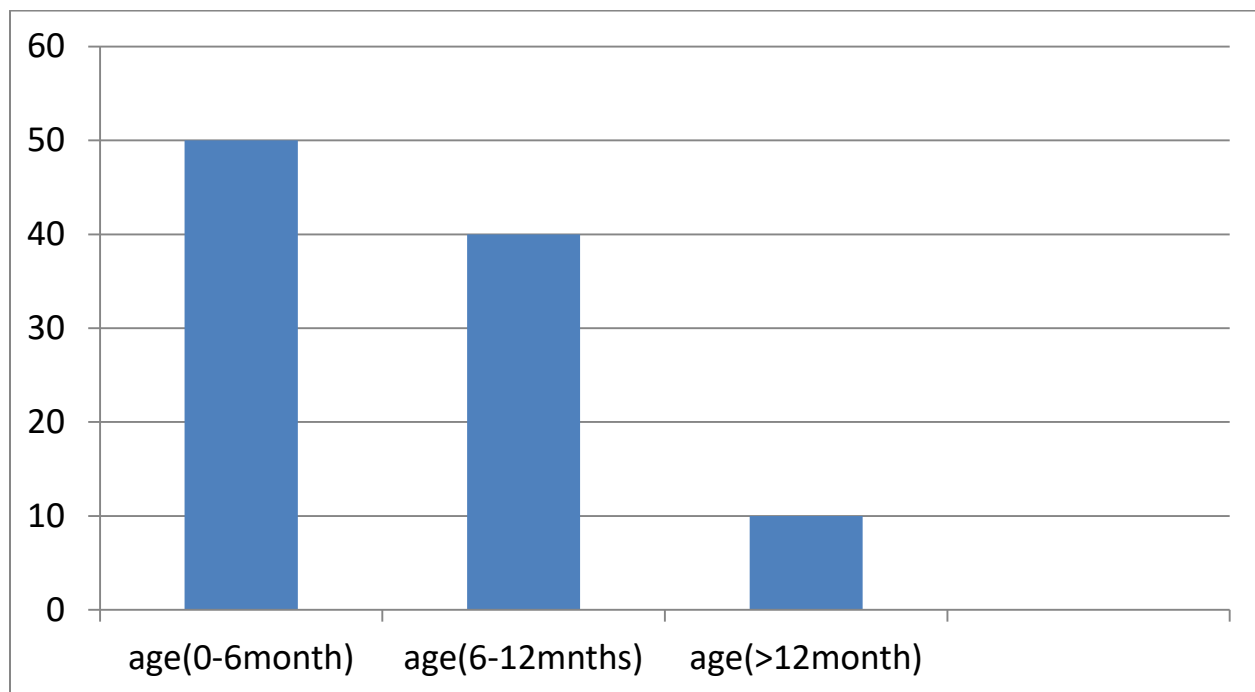


Table 4: Duration of illness

	Duration of illness
3% saline	2.4+/-0.92
Adrenaline	2.6+/-1.04.

Table 5: Baseline Clinical Scores

	Baseline clinical scores
3% saline group	5.95+/-1.76
Adrenaline group	5.4+/-2.6

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Table 6: Mean Duration of Hospital Stay

Hospital Stay	Days
3% saline group	3.7+/-2.0 days
adrenaline	4.0+/-2.2 days
P value	<0.05 statistically significant.

The duration of illness for 3% saline group was 2.4+/-0.92 and adrenaline group was 2.6+/-1.04.

The clinical scores at admission for 3% saline group were [5.95+/-1.76] and adrenaline group was [5.4+/-2.6] but the difference was not statistically significant.

The mean duration of the hospital stay was slightly higher in the adrenaline group [4.0+/-2.2 days] when compared to 3% saline group [3.7+/-2.0 days].

P value was <0.05 which was statistically significant.

Conclusion

It is concluded from our study that nebulised hypertonic 3% saline is a better treatment modality in comparison to nebulised adrenaline in acute bronchiolitis. Infants treated with 3% saline showed greater improvement and early hospital discharge. This may be due to additional mechanisms by which hypertonic saline acts in bronchiolitis like increasing ciliary beat frequency, release of prostaglandins (Mandelberg and Amrav, 2010) etc. Hence, as per our study hypertonic 3% saline may be used as a preferable treatment option along with conventional humidified oxygen and i.v fluids. Lack of systemic side effects, ease of administration and a good safety profile with easy availability makes it a promising option compared to adrenaline in cases of acute bronchiolitis. However, further studies can be done assessing efficacy of combined adrenaline and hypertonic saline. Since these have similar mechanisms of action there is a possibility of a potential synergistic role with 3% saline.

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