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Comparison of Nebulized Salbutamol and Epinephrine in Acute Bronchiolitis

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ABSTRACT

Background: : Bronchiolitis, known to be a common disease of the lower respiratory tract infection of infants, and there is a lot of debates in its modalities of treatment. **Aim**: To produce a methodical survey considering, the efficacy Of the ordinarily used medications for bronchiolitis (Nebulized Salbutamol and epinephrine) in infants with acute bronchiolitis

Patients & Methods: A prospective study on one hundred twenty patients with bronchiolitis admitted to Al- Khansa' Maternity and Children Teaching Hospital between the per the first of December 2012 till the thirtieth of April 2013. The babies who were enrolled in this study were having their 1st attack of bronchiolitis and their age was less than one year . Information were taken from their mothers including age ,sex , gestational age , residence , feeding , socioeconomic status, family history of atopy , parental smoking , number of persons per room , the presenting signs and symptoms (fever, cough, dyspnea , cyanosis , rhinorrhea , tachypnea , apnea , poor feeding and irritability, respiratory distress ,hyperinflation , fine crepitation , wheeze) . Chest radiography was taken to all patients. The babies assigned randomly in order to receive either (group1) nebulize adrenaline (0.5ml/kg up to a 2.5ml with 3ml normal saline) or(group2) salbutamol (0.15mg/kg with 3ml normal saline) by nebulizer along with oxygen.

Results: We compare the effect of adrenaline nebulizer versus salbutamol nebulizer which revealed better effect of adrenaline over salbutamol in reducing in oxygen requirement, respiratory rate and wheeze. Most of radiological findings were air trapping and Increase vascular marking With little consolidation and collapse. Bronchiolitis was more common in low socioeconomic families and in those with parental smoking and in overcrowding areas. Breast feeding has protective role. Recommendation :in our work we recommend use of adrenalin over salbutamol but also little evidence is important to back up the habit of use of either of these drugs in the treatment of the babies with bronchiolitis. A larger, and better-designed pragmatic study on some common known interventions on bronchiolitis is important to choose an effective treatment strategy, to manage this disease.

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Introduction

Bronchiolitis known as a disease affecting the lower respiratory tract of children causing obstruction of the small airways. (1) , although most children experience some simple type of bronchiolitis. But , up to 3% of the affected patients especially within the first year of their life need hospitalization. The respiratory syncytial virus (RSV) is considered the causative agent for70%of the cases in general and for 80% to 100% during winter . influenza Parainfluenza, and adenovirus, account for the remaining.(2,3,4)

Treatments are classified as specific or as symptomatic. The familiar specific treatment is ribavirin aerosolized, it is for RSV. Symptomatic treatments are bronchodilators and corticosteroids. Little information is known about the strategies for treating this disease, and, so care should be taken for different settings and different countries.(5,6,7)

Patients and method:

One hundred twenty patients with bronchiolitis admitted to Al- Khansa' Maternity and Children Teaching Hospital were studied during the period from the 1st of December 2012 to the 30thof April 2013. Those with congenital heart disease, atopy and pneumonia were excluded from this study.

Information were taken from their mothers including age ,sex , gestational age , residence , feeding , socioeconomic status, family history of atopy , parental smoking , number of persons per room , vaccination , the presenting features (fever, cough, dyspnea , cyanosis , rhinorrhea , tachypnea , apnea , poor feeding and irritability.

All the babies were examined carefully mainly concentrating on the respiratory system looking for the signs of bronchiolitis (respiratory distress, hyperinflation , retractions , fine crepitation , wheeze , etc) . Chest radiography was taken to all patients.

The babies considered randomly in order to take either nebulized 1:1000 dilution adrenaline (0.5ml/kg up to 2.5ml with 3ml normal saline) in Group 1, or salbutamol (0.15mg/kg with 3ml normal saline) in Group 2 by nebulizer along with O2 for aperiod of five minutes at 0, 30,60 minutes, intravenous fluid was given

All babies were examined from the beginning and after ten minutes of the three nebulization with regard to their heart rate , respiratory rate and oxygen saturation by pulse oximetry (SpO2) .

We compare between the two groups , before and after interventions.

The analysis by using chi square method where the p- value less than 0.05 is significant and less than 0.001 as highly significant , while if it is more

than 0.05 as not significant . Data was analyzed using the Student's t-test.

Results:

full term infants were 112 and8 patients were premature and their mean age at the time of illness were 6.75 +- 2.12 months Males were 79(65.8%), females were 41(34.2%), and the male to female ratio was2:1overcrowding was present in 93 (77.5%) of patients and in 62(62.0%) of control . It was also significant were P value (0.012) as shown below.

Table (1) The prevalence of risk factors in infants with bronchiolitis

Risk factor	Bronchiolitis (n= 120)	
	No.	%
Family history of atopy	33	27.5
Family history of smoking	71	59.2
Over crowding	9 3	77.5

43 patients (35.8%) were exclusively breast-fed , 35 patients (29.2%) were mixed-fed and 42patients (35%) were formula-fed .

Bronchiolitis was more common in low socioeconomic families i.e.31(28%) &36 (30%) were in social class 5&4.

fever is more common among patients older than 6 months of age in comparison to patients younger than 6 months of age , where the P value is (0.003) .Irritability is more common among patients younger than 6 months of age in comparison to patients older than 6 months of age where the P value is (0.001) other presenting signs and symptoms include upper respiratory tract infection cough respiratory distress poor feeding increase respiratory rate and heart rate, wheezes, rales and apnea,

There was no significant difference of radiological findings between infants with bronchiolitis under and over 6 months of age , where the radiological finding in patients under 6 month of age were : air trapping present in 41 (68.3%), increase vascular marking 39 (65%), consolidation 5 (8.3%), collapse 2 (3.3%) and normal films in 16 (26.6%) ,but the radiological finding in patients

over 6 month of age were : air trapping present in 36 (60 %), increase vascular marking 43 (71.6%), consolidation 6 (10%), collapse 1 (1.7%) and normal films in 13 (21.7%)

Table 2 : Mean and Standard deviation (SD) of parameters in the both groups before nebulization

Groups of patients	Heart/min	Resp./min	Spo2
Group 1	158.0 ± 14.7	62.4 ±13.6	92.15 ±3.00
Group 2	155.2 ± 12.3	60.67±9.74	92.55 ±3.00
P value	0.256	0.414	0.466

Table 3 Alteration in parameters after three nebulization in both groups Mean ± (SD) change in parameters.

Groups of patients	Heart rate	Resp. rate	Spo2
Group 1	7.37 ±2.42	8.43 ±2.55	4.33±1.61
Group 2	7.17 ±2.04	7.25 ±1.64	3.57 ±1.50
P value	0.597	0.003	0.008

Results showed no valuable change in the heart rate, but there was a significant difference in change in respiratory rate so favoring of epinephrine (p =0.003) and a significant difference in change in oxygen saturation by pulse oxymetry (SpO2) favoring. Epinephrine.

The adverse effects as tachyarrhythmia, anxiety, tremors or pallor were not significant with either adrenaline nor with salbutamol initially or during subsequent nebulization.

Analyzing the findings showed propagation in respiratory conditions (resp. rate &SpO2) with better response in the adrenaline .

This study also did not find any significant difference in increase in cardiac rate of any group while a simple t short term rise in heart rate in both groups after giving nebulization.

Discussion:

In this study the peak age was five months and the mean age was 7 ± 3.3 months which is similar to Dr. kawes(8)

In our work male to female ratio was 2:1 and this agree with dr.eser(9) overcrowding increase the risk of the infection which is similar to Jansson L(10)

In this study Analyzing the outcome display a significant betterment in respiratory condition (resp. rate & SpO2) especially in the adrenaline .

Also we did not find any considerable difference in accretion in heart rate in the two sets. We did not notice adverse effects of the bronchodilators which was the same in other studies (11,12,13)

This study agree with John BM (14)and John BM (15)Ray MS, (11)and Bertrand P,(16). The favoring of the adrenaline has been significant due to: (17)

(i) The -adrenergic constrictor effect that can decongest the mucosa, decrease its absorption, as well as controlling pulmonary vascular supply, with minute effect on ventilation/ perfusion matching،

(ii) Adrenergic bronchial muscle relaxant action

(iii) Adrenergic effect which decrease release of chemical mediators،

(iv) Physiological antihistamine effect that can antagonize histamine effects, as edema.

(v)decrease of catarrhal secretion.

Conclusions

There is a valuable betterment in respiratory condition (resp. rate, & oxygen saturation by pulse oxymetry) which was preferable in the epinephrine than salbutamol.

In deduction, while it can be said that nebulized adrenaline and salbutamol are safe and useful in wheezy children with bronchiolitis , with epinephrine peferable to salbutamol in controlling respiratory difficulty, there is a need for large multicentric randomized blinded studies to prove our results.

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