RISK FACTORS FOR BRONCHIOLITIS IN INFANTS OF HAZARA DIVISION – A CROSS SECTIONAL STUDY

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ABSTRACT

OBJECTIVES

Bronchiolitis is one of the major causes of hospitalization in the infants. Higher rate of hospitalization and mortality can be reduced by recognizing and control of risk factors for bronchiolitis. The objective of this study is to ascertain risk factors of bronchiolitis in infants, in local population of Hazara Division.

METHODOLOGY

This cross-sectional study was done in Ayub teaching hospital form January, 2020 till June 2020. Infants of both gender from age of 3 months to 12 months were included with diagnosis of bronchiolitis. Patients with croup, pneumonia, cystic fibrosis and bronchomalasia are excluded. Demographic variables, clinical characteristics and risk factors of bronchiolitis related to infant, mother and family were documented on specific proforma. The data was analyzed by SPSS 21.

RESULTS

There were 101 infants. Mean age was 5±3.5 months. Male to female ratio was 2.8. 77.2% infant had delivery through surgical procedure and 82% are term. 45% infants were exclusively breast fed. 34% patients room were carpeted, 35% exposed to molds and 81% had history of contact with infected person.28% infants are exposed to passive smoke, 49% had history of allergies and 60% mothers uses perfume to their child's. 31% infants have more than 10 family members and are living in 2 rooms (p=0.000). Infant weaned at 6month have late onset of bronchiolitis as compare to infants weaned before 6 months (p=0.000).

CONCLUSION

Perfume/powder use, family history of allergies, history of contact with respiratory infection, delivery with surgical procedure as major new risk factors. Carpets, mold, passive smoking, overcrowding, are also contributing risk factors.

KEYWORDS: *Infants, Bronchiolitis, Risk Factors*

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INTRODUCTION

Acute lower respiratory tract infection (LRTI) is associated with significant mortality among infants.[1] Most common LRTI associated with infants is bronchiolitis. Human respiratory syncytial virus (RSV) is important causative agent of bronchiolitis among infants that account for 60-85% of bronchiolitis cases in infant.[2] Reinfection are commonly seen in any age group. RSV circulation have seasonal pattern, peak outbreaks reported in autumn, winter or spring but not in summer.[3] Clinical presentation of bronchiolitis varies from mild upper respiratory symptoms of rhinorrhea nasal congestion, fever, cough to life threatening lower respiratory symptoms like wheezing, tachypnea, retraction with respiratory

efforts.[4] Wheezing in first year of life is highly suggestive of bronchiolitis in infants.[5] Globally, countries having higher mortality rates, acute respiratory illness (ARI) is leading cause of death under five years.[6] In Pakistan ARI continues to be 2nd leading cause of death.[7] High altitude areas of developing countries have higher incidence of respiratory infections including areas in North West part of Pakistan. Highest incidence of ARI is reported between 2-6 months of infancy.[8] Various demographic and epidemiological risk factors are associated with bronchiolitis as low birth weight, male gender, early onset of disease (age $\leq$ 6 months), overcrowding, house hold smoking and family history of allergies.[9,10] Infants with high risk have more frequency of hospitalization. High risk individual with bronchiolitis are infants with chronic lung disease, bronchopulmonary dysplasia, immune deficiencies and congenital heart disease. Majority of infants deaths with bronchiolitis occur in full term, normal weight babies.[11] This emphasizes to explore additional risk factors like mold exposure, dampness, use of perfumes and powder, history of contact with infected person, weaning history, mode of delivery. Many bronchiolitis infants need hospital admission according to severity of disease, risk factors and hospital protocols. It is widely accepted that errors occur and infants are sent home from emergency department inappropriately leading to morbidity and mortality.[12] The objective of this study is to assess risk factors for bronchiolitis in infants of local population of Hazara division. Bronchiolitis is most common LRTI in infants and its mortality is continuously increasing. By identifying and establishing of high-risk factors of bronchiolitis, this study is providing reliable data to pediatricians for better management including prevention and counselling parents of infants with bronchiolitis.

METHODOLOGY

This cross-sectional study was done in pediatric department of Ayub teaching hospital form January, 2020 till June 2020 after getting approval from institutional review board. Data from care giver were extracted and recorded on questionnaire after obtaining informed consent. All infants presented with diagnosis of acute bronchiolitis documented by clinician and met the criteria were included. Inclusion criteria included infant of one month age up to 12 months. Patient's age less than 1 month and greater than 1 year are not part of study. Infants with congenital pulmonary diseases including cystic fibrosis, bronchomalasia, immunodeficiency and syndromic features were excluded. After establishment of diagnosis, demographic variables including age, weight, gender were recorded on specific proforma along with clinical characteristics and risk factors including body temperature, contact, history of allergy in family, use of perfume/powder, breast feeding, exposure to smoking, molds at home, family members and number of rooms in home, gestational age and mode of delivery. Guardian/parents giving history of 1st degree relative with allergy are taken as positive family history of allergy. The data was analyzed in SPSS 21. P value < 0.05 for comparative variables was taken as statistically significant.

RESULTS

The present study recruited 101 infants (n=101) presented with bronchiolitis from 1 month to 1 year. Among these 73.3% (74) were male and 26.7% (27) were female. Male to female ratio was 2.8. The mean age of sample was 5.03 ± 3.5 months (range = 1 month - 12 month). The mean weight of infants presented with bronchiolitis was 4.9kg ± 1.7.55.4% (56) subjects had assisted vaginal delivery, 22.8% (23) through caesarean section and 21.8% (22) had normal mode of delivery. Majority infants had birth history of term (82%), 16% had preterm and 2% had birth history of post term. Average weight of preterm at presentation was 4.46±1.3 which is less than term individuals (5.0±1.7) with significance of 0.069, as shown in fig no 1.

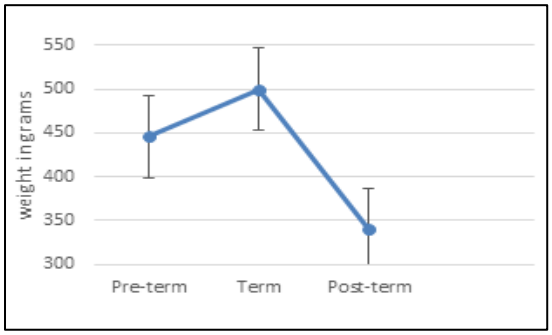

Figure 1: Relation of Weight of Infancts Verses Birth History

Preterm individual and post term individual present at younger age (4.69±1 and 2±1.4 months respectively) as compare to term infants (5.17±3.7) with significance of 0.002 as shown in plot no 2. Mean body temperature of preterm infant was recorded as 101°F±2, post term 99°F and term 98°F±2 with significance of 0.002 as shown in Fig no 2.

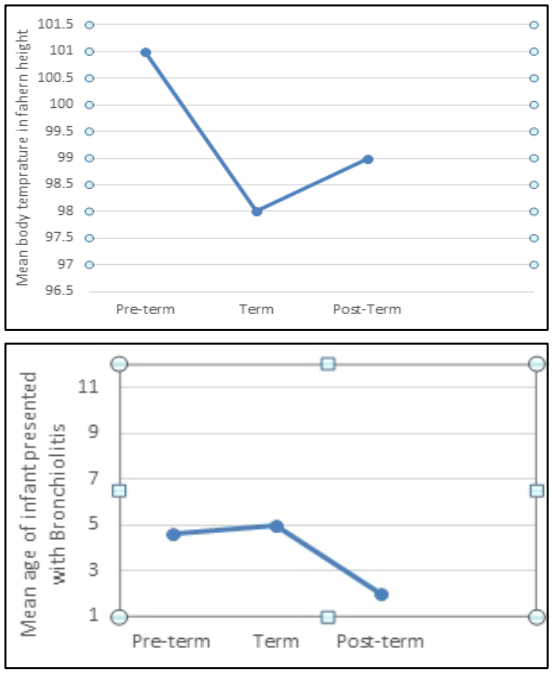

Figure 2: Mean Body Temperature Verses Birth History of Infant

Two patients had birth history of high birth weight, 40% (41) infants had birth history of low birth weight (LBW) and 57 infants had birth history of normal weight. 45% infants fed on breast milk exclusively detail shown in Bar Chart 1. Infants having history of weaning at 6 months are older (8.4 month) than infant weaned before 6 months (6 month) with significance of 0.00 (mean age 8.4) while infant weaned before 6 months.

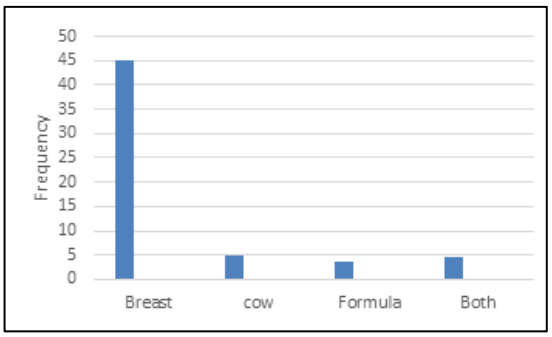

Figure 4: Bar Chart Showing History of Feeding

28.7% (29) bronchiolitis infants had exposure to second hand smoke, 34% infants (35) had history of living in carpeted room, 35% (36) exposed to mold, 49.5% (50) had family history of allergy, 60% mothers (61) used perfumes/powders to their infants and 81.2% (82) individuals had contact history with person infected respiratory tract. 31% infants have more than 10 family members and are living in 2 rooms (p=0.000).

DISCUSSION

In our study we found several environmental demographic and familial risk factors of bronchiolitis among infants in tertiary care hospital. The mean age of population studied was 5.0 month which is little older than reported by EI-Radhi, et al. 4.4months and Bradly, J.P. et al 4months but fall in typical age range of bronchiolitis (2-5) month.[10,11] The predominant gender in our study was male, which is accordance with the studies by EI-Radhi and Bradly. Mean weight in our study was 4.9 kg whereas Mosalli et al reported 3kg.[12] This difference may be due to relatively small sample size in study done by Mosalli. Furthermore, greater than 80% of infants reported by Mosalli et al had moderate to severe disease, so this difference in weight may be due to sampling bias. 45% bronchiolitis infants were fed on breast milk exclusively while study conducted at Mayo hospital Lahore states 38%.[2] This may be due to difference in age of studied population as our studied population is younger. Breast feeding trends also drop after 1 year in Pakistan. According to survey on breast feeding trend in Pakistan rate of breast feeding drop to 51% from 78% as age increases from 1 to 2 years.[13] 36 infants (35%) had history of mold exposure at their home, Stark, P.C., et al states that mold exposure and dampness increase incidence of lower respiratory tract infection in 1st year of life.[14] Passive smoke exposure in infant significantly increases lower respiratory tract infection in infants.[15] In this study 28% bronchiolitis infants were expose to second hand smoking while Bradly, J.P.et al reported 40%. The difference can be due to large sample size of Bradly, J.P.et al (n=206). We reported 49.5% infant have family history of allergy, which is slightly higher than reported by Bradly, J.P.et al. According to Bradly, J.P. 45% infant's first degree relative have allergic history. Majority of infants diagnose as bronchiolitis are term individuals (85%) while study done in Faisalabad Pakistan states 79.5% individual have history of birth at term, the minor difference may be due to age limit, their observation focused on age up to 2 years, while over target age group is up to 1 year. Mean body temperature of 85% individual (Term infants) is 98°F, which is also justified by Ahmad S et al, that most of bronchiolitis individual were afebrile.[16] In our study preterm infants have significantly high body temperature and weight, less than term infant showing severity of bronchiolitis in these infants.[10,11] 31% infants are living in house with 2

rooms and family members of 10 and greater, these individual are susceptible to overcrowding environment (significance of p = 0.000). Overcrowding is also significant risk factor of bronchiolitis.[9] Infant having history of weaning before 6 months have significantly early onset of bronchiolitis M.R. Savitha et al as compare to infants who weaned before and after 6 month. But in literature it has also been evident that enteral nutrition decreases the respiratory distress when patients are on noninvasive ventilation.[17,18]

LIMITATION

Present study had certain limitations. It did not confirm the laboratory diagnosis of bronchiolitis due to lack of facility for viral PCR. Most of the results were compared with the data of other countries due to lack of country data unfortunately. The infants were not followed till discharge, as discharge status not accessed in this study. Stratification of bronchiolitis severity is not done in this study.

CONCLUSION

Bronchiolitis affects predominantly males. Preterm infants had early onset of bronchiolitis. Perfume/powder use, family history of allergies, history of contact with respiratory infection, delivery with surgical procedure as major new risk factors. Carpets, mould, passive smoking, overcrowding, are also contributing risk factors.

CONFLICT OF INTEREST: None

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