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Original Article

Bronchiolitis among Sudanese children: Risk factors and Clinical presentation

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ABSTRACT

Background: Bronchiolitis is most commonly presents in infants aged three to six months. The objectives of this study were to determine the risk factors and clinical presentation of bronchiolitis in Sudanese children attending GaafarIbn A of Hospital for children in Khartoum. **Methods:** The study design was descriptive. All children less than two years of age admitted to the hospital during the study period with the criteria fulfilling the diagnosis of acute bronchiolitis were enrolled in the study. The sample size was taken as 100. Data were collected by a questionnaire and medical examination. Informants for the questionnaire were the children mothers. Data was analyzed by SPSS software. **Results:** Children aged 0-6, 7-12 and more than 12 months constituted 68%, 19% and 13% respectively. Most children (92%) had siblings and 78%lived in un crowded environment at home. As regards parental smoking, 36% of the parents were cigarette smokers. Results showed that 34% of children had a past history of hospitalization. Seven percent of the children were delivered as pre term. The most common clinical presentation of bronchiolitis were cough, wheeze and shortness of breath constituted 87%, 82% and 64% respectively. Conclusion: The risk factors for Bronchiolitis were young age (0-6 months), presence of a sibling, a history of hospital admission and paternal history of tobacco smoking. The most common clinical presentations were cough, wheeze and crepitation.

1. Introduction

Bronchiolitis of infancy is a clinically diagnosed respiratory condition presenting with breathing difficulties, cough, poor feeding, irritability and apnoea in the very young infants. These clinical features together with wheeze and/ or crepitations on auscultation combine to make the diagnosis. The diseaseis most commonly presents in infants aged three to six months**[1]**.

Bronchiolitis occurs in association with viral infection respiratory syncytial virus(RSV) in around 75% of cases and is seasonal with peak prevalence in winter (November to March) when such viruses are widely spread in the community and re infection during one season is possible**[2]**. The burden of disease is high, around 70% of infants are infected with RVS in their first year of life and 22% develop symptomatic disease. Since RSV is associated with only 75% of bronchiolitis, it may be estimated that around a third of cases develop the disease (from all viruses) in their first year of life**[3]**. The rate of admission with bronchiolitis has significantly increased over the last ten years, the reasons which are most likely to be multifactorial, are not fully understood**[4]**.

The risk factors of bronchiolitis include age between 6 and 12 months. Pre mature infants have a higher chance of acquiring RSV- associated with bronchiolitis**[5]**. Chronic pulmonary disease and hemodynamically significant congenital heart disease are associated with bronchiolitis; on the other hand immunodeficiency, neurologic disease and defects of the airway are associated with the disease. Less severe forms of bronchiolitis is associated with asthma**[6]**.

Bronchiolitis is associated with social factors: The disease is associated with low socioeconomic status **[7]**, Parental smoking is also associated with RSV- related hospitalization and bronchiolitis**[8]**. Studies showed an association between having siblings at home and increased risk of clinically diagnosed bronchiolitis**[9]**. Breast feeding have a protective mechanism against the disease so breast feeding for less than two months is associated with the disease **[10,11]**.

In most infants the disease is self limiting, typically lasting between three and seven days. Most children are managed at home, often with primary care support. Admission to hospitals is generally to receive supportive care such as nasal suction, supplemental oxygen or nasogastric tube feeding.

Children with underlying medical problems such as prematurity, cardiac or respiratory disease are most susceptible to severe condition and higher rates of hospital admission. In pre-term infants less than six month of age. Admission rate with acute determine risk factors and clinical presentation of bronchiolitis

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bronchiolitis is about 6.9% including more frequent admission to intensive care units[4]. The objectives of this study were to in Sudanese children attending Gaafar Ibn A of Hospital for children in Khartoum.

2. Patients and methods

The design was a descriptive study conducted at Gaafar Ibn A of Hospital for children. The hospital which is situated in Khartoum state is the first pediatric hospital in the Sudan and receiving patients from Khartoum state as long as refers from all over the country. All children less than two years of age admitted to the hospital during the study period with the criteria fulfilling the diagnosis of acute bronchiolitis were enrolled in the study. Children with bronchial asthma, pneumonia, foreign body inhalation and pulmonary tuberculosis were excluded from the study. The sample size was taken as 100. Data was collected by a pre coded and pre tested questionnaire. Informants were the mothers after acquiring an informed consent from them as long as permission from the hospital authority. Analysis was conducted by SPSS version 20.

3. Results

Table (1) shows the risk factors for bronchiolitis, children aged 0-6, 7-12 and more than 12 months constituted 68%, 19% and 13% respectively. Most children (92%) had siblings while 8% of them had no siblings. Most children lived in uncrowded environment at home (78%), children who lived in crowded housing constituted 22% of the sample. As regards parental smoking, 36% of the parents were cigarette smokers while 64% were not smokers. Results showed that 34% of children had a past history of hospitalization while 66% had not. Results showed that 7% of the children were delivered as pre term while 93% were delivered as full term.

Table (2) shows the Clinical presentation of bronchiolitis. Cough, wheeze, shortness of breath crepitations, chest retardation and Coryza constituted 87%, 82%, 64%, 45%, 41% and 5% respectively. Low, moderate and high respiratory rate among respondents was 67%, 20% and 13% respectively. As regards fever, normal moderate and high grade fever were 67%, 20% and 13% respectively. Most of respondents showed normal level of oxygen saturation (68%). Moderate and low levels of oxygen saturation constituted 9% and 23% respectively

Table 1: Risk factors of bronchiolitis

Risk factors	Frequency	Percent
Age/ months		
0-6	68	68 %
7-12	19	19%
13-23	13	13%
Total	100	100%
Presence of siblings		
Present	92	92%
Absent	8	8%
Total	100	100%
Housing condition		
Crowded	22	22 %
Not crowded	78	78%
Total	100	100%
Paternal smoking		
Yes	36	36%
No	64	64%
Total	100	100%
Past history of admission		
Yes	34	34 %
No	66	66 %
Total	100	100 %
Gestational age		
Term	93	93 %
Pre term	7	7 %
Total	100	100 %

Table 2: Clinical presentation of Bronchiolitis

Clinical presentation	Frequency	percent
Symptoms		
Cough	87	87%
Wheezes	82	82%
SOB	64	64%
Signs		
Crepitations	45	45%
Chest retardation	41	41%
Coryza	5	5%
Respiratory rate		
Low(40-59)	67	67%
Moderate (60-70)	20	20%
High (More than 70)	13	13%
Fever		
Normal (36.5-37.5)	67	67%
Low grade (37.6-38.9)	20	20%
High grade(More than 38.9)	13	13%
Oxygen saturation		
Normal (More than 95%)	68	68%
Moderate (92%-94%)	9	9%
Low (Less than 92%)	23	23%

n=100

4. Discussion

Bronchiolitis occurs in children less than two years of age and associated with viral infection respiratory syncytial virus (RSV). The study showed an increase susceptibility of infection in infants less than six months of age. This finding is in line with studies conducted in Saudi Arabia and Spain**[12,5]**. The study showed that 7% of infants with bronchiolitis were premature. A study conducted in Canada showed higher prevalence of 20%prematurity associated with bronchiolitis**[13]**. Inadequate defense against infection and incomplete development of the airway are probably the most important factors which explain the relation between prematurity and bronchiolitis. The premature infant has a lower number of alveoli and anatomic barriers to gas exchange leading to increase fatality**[14]**. Maternal IgG are found to have a protective role against RSV infection. This transfer of antibodies occurs at the latter stage of pregnancy therefore prematurity hold a greater risk for RSV infection**[15]**.

Results showed that 92% of the children had siblings. Infants with siblings are most likely to have bronchiolitis than those without siblings; this explains the greater likelyhood for viral exposure to infection among infants with a sibling**[9]**. Our findings showed a high rate of paternal smoking which in line with a study conducted in Saudi Arabia**[12]**. On the other hand no maternal smoking was reported in this study, may be due to social reasons that female smoking is unacceptable in the Sudanese society and if a female smokes usually does not disclose to others.

5. Conclusion

The study concluded that risk related factors for Bronchiolitis were young age (0-6 months), presence of a sibling, a history of hospital admission and a paternal history of tobacco smoking. The most common presentation was cough, wheeze, crepitations, chest retardation, low respiratory rate, normal temperature and normal oxygen saturation. The study highlighted the importance of raising parents' awareness for bronchiolitis and recommending further studies.

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