Original Article

A Comparative Study On Clinical Profile Of Rsv And Non-Rsv Bronchiolitis Children Attending A Tertiary Care Centre

Dr. Veda Sai Kotha MBBS MD[1], Dr. Sunitha Ramasamy MBBS MD[2*], Dr. Jaishree Vasudevan MBBS MD[3], Dr. Antony Jenifer MBBS MD[4]

[1]Paediatric Postgraduate, Department of Paediatrics, Chettinad Hospital and Research Institute, Chettinad Academy of Research and Education, Chennai.
[2*]Assistant Professor, Department of Paediatrics, Chettinad Hospital and Research Institute, Chettinad Academy of Research and Education, Chennai. E-mail: sunitharamasamy1992@gmail.com
[3]Professor, Department of Paediatrics, Chettinad Hospital and Research Institute, Chettinad Academy of Research and Education, Chennai.
[4]Professor, Department of Paediatrics, Chettinad Hospital and Research Institute, Chettinad Academy of Research and Education, Chennai.
DOI: 10.47750/pnr.2023.14.02.59

Abstract

Introduction: Acute bronchiolitis is a self-limiting lower airway disease affecting infants and children with Respiratory Syncytial Virus (RSV) being the most common causative organism accounting for 50%-80% of bronchiolitis cases. Other than RSV, viruses like parainfluenza, adenovirus, rhinovirus, human metapneumovirus can also cause bronchiolitis. Basic supportive treatment remains the cornerstone of management.

Materials and Methods: This is a prospective study, conducted for a 6month period i.e from July 2021 to Dec 2021. The demographic characteristics and clinical features of children aged between 1 month to 3 years who fulfilled the inclusion criteria were noted in predesigned proforma. Nasopharyngeal swab was sent for viral analysis. Cases were then divided into RSV and non-RSV groups and clinical characteristics were compared.

Results: Among 90 cases, RSV was positive in 50% cases. Fast breathing was significantly higher (57.5%) in non-RSV group. 68.8% of non-RSV cases had wheeze as compared to 31.3% of RSV cases that was statistically significant. No statistically significant difference was observed in other clinical parameters based on viral etiology. The duration of hospital stays and oxygen therapy was found to be higher in RSV positive cases.

Conclusion: In children with bronchiolitis, clinical presentation and severity of disease didn't differ between RSV and non-RSV infections. Virological testing may not have a role in clinical diagnosis or management except for isolation or minimizing the use of antibiotics.

Keywords: Nasopharyngeal Swab, Fast Breathing, Oxygen Therapy.

INTRODUCTION

Bronchiolitis is a common and potentially serious viral respiratory illness which typically occurs as a seasonal epidemic, and it primarily affects in infants and young children around the world. Despite its pathological meaning, "bronchiolitis" is a clinical term for a condition that is characterized by coryza, cough, fever, increased respiratory effort, chest hyperinflation, wheezing, widespread fine crackles on auscultation, and poor feeding. Bronchiolitis affects approximately 2-3% of all infants in developed countries. Bronchiolitis is estimated to account for two million children under five years of age who need medical attention each year [1]. Approximately 3-10% of infants admitted to a Paediatric Intensive Care Unit (PICU) because of bronchiolitis develop respiratory failure [2, 3]. Although infection can occur at any time of the year, winter is typically when the epidemic peaks. In 50-80% of cases, the Respiratory Syncytial Virus (RSV) is the most common cause of acute bronchiolitis; but sometimes, other viruses have additionally been stated to bring on bronchiolitis [3]. Other viruses that can cause bronchiolitis include parainfluenza, adenovirus, rhinovirus, and human metapneumovirus. These findings raise concerns about the clinical relevance of the etiological agent, particularly considering the question of whether or not the RSV virus causes disease in a manner like

other viruses [4]. In current study, the comparison of the demographics, clinical characteristics, and prognosis of children with RSV bronchiolitis and non-RSV bronchiolitis admitted in department of paediatrics at Chettinad hospital and research institute was done.

Type of Study

Prospective Observational study.

Patients and methods

Study Population

This study included children under the age of three who were admitted to the Department of Pediatrics at Chettinad Hospital and Research Institute with a diagnosis like bronchiolitis between July and December 2021. The study excluded children with a family history of asthma and chronic lung disease, or critical congenital heart defect.

Data Collection

In current study, the data included are: (a) Demographic and epidemiologic details of the patient (which includes: age, gender and date of admission). (b) Birth history with specific history pertaining to any history of prematurity <32 weeks of gestation or extreme prematurity, critical congenital heart defect, chronic lung disease. (c) Any co-infections at the time of admission. (d) Investigations done such as nasopharyngeal swab for viral panel, blood investigations such as complete blood count, blood culture and radiological investigations such as Xray. (e) Treatment given during the hospital stay (such as nebulizations with bronchodilators, budesonide, intravenous or oral steroids, antibiotic use and invasive and non-invasive mechanical ventilation). (f) Any ICU admissions for oxygen requirements and duration, duration in hospital stay. Cases were then divided into bronchiolitis caused by RSV and not caused by RSV groups based on viral panel reports. These two groups were then compared in terms of demographic features, clinical features at the time of admission, and outcome of the disease in terms of duration of hospital stay, any ICU admission etc. IHEC clearance was obtained for the study.

Virological Detection

Nasopharyngeal samples were taken using nasopharyngeal swabs within 24 hours of admission. The samples were sent to the Serum Institute in Guindy in a viral transport medium in order to determine the causative organism.

Statistics

Descriptive analyses were conducted with aid of mean and standard deviation for quantitative variables, frequency, and proportion for categorical variables. For variables that were not normally distributed, a non-parametric test (the Mann-Whitney U test) was used. A p value of 0.05 was regarded as statistically significant. All analyses were formed by using the SPSS 15.0 software.

Results

In total, 90 children were included in the final analysis, with 45 (50.0%) belonging to the RSV group and the rest 45 (50.0%) children belong to the non-RSV group. The demographic profile and its analysis were revealed that the proportion of children below the age of one year was relatively higher in the RSV group than the non-RSV group. In terms of gender and age, there was no statistically significant difference between the two groups as displayed in Table/Fig-1.

While taking the body temperature within initial 24 hours of admission, 52.5% of non-RSV group cases found to have fever of >100.40F and 47.5% of RSV cases had also the fever of >100.4F. Fast breathing was significantly higher in the non-RSV group (57.5%). [Table/Fig-2]

There is also found to have a statistically significant difference in the proportion of subjects who had wheeze (31.3% vs 68.8%, p-value 0.008). Other clinical parameters shown to be no significant difference statistically as shown in [Table/Fig-3]. Patients who are RSV positive had to stay long in hospital, to get more duration of oxygen therapy.

Table: 1

Demographic features	RSV(n=45)		Non-RSV(n=45)		
Age-	No	%	No	%	p value
1month-6months	23	51.10%	21	46.60%	0.612
7months-1yr	13	28.80%	18	40%	
1yr-1yr6m	5	11.10%	5	11.10%	

1yr7m-2yrs	4	8.80%	1	2.20%	
Sex-	**No**	**%**	**No**	**%**	**p value**
Male	30	50.80%	29	49.20%	0.824
Female	15	48.40%	16	51.60%	

Table: 2

Clinical features	**RSV(n=45)**		**Non-RSV (n=45)**		
Symptoms-	**No**	**%**	**No**	**%**	**p value**
Fever	19	47.50%	21	52.50%	0.671
Cough	41	50%	41	50%	1
Cold	41	48.20%	44	51.80%	0.361
Sensorium	45	50%	45	50%	
Fast breathing	***31***	***42.50%***	***42***	***57.50%***	***0.006***
Lethargy	9	36%	16	64%	0.099
Any refusal of feeds	16	51.60%	15	48.40%	0.824

Table: 3

Clinical features	**RSV(n=45)**		**Non-RSV(n=45)**		
Signs-	**No**	**%**	**No**	**%**	**p value**
Tachycardia	24	49%	25	51%	0.832
Tachypnoea	32	45.70%	38	54.30%	0.128
Wheeze	***10***	***31.30%***	***22***	***68.80%***	***0.008***
Crepts	15	53.60%	13	46.40%	0.649
Good pulse volume	43	49.40%	44	50.60%	1
Good perfusion	43	49.40%	44	50.60%	1
Increased WOB	35	46.70%	40	53.30%	0.157

Outcome	**RSV (n = 45)**	**Non-RSV (n = 45)**	
	Mean +/-SD	**Mean +/-SD**	**p value**
Duration of Hospital stay	4.44+-1.83	4.27+-1.74	0.638
Duration of oxygen therapy	3.1+-1.27	2.68+-1.42	0.226
Spo2 at room air	93.44+-3.76	92.93+-3.83	0.524

DISCUSSION

This prospective study was carried out to compare the outcomes between RSV and Non-RSV Bronchiolitis and to better understand the demographics, clinical features, and prognosis of children with two different groups of bronchiolitis.

Bronchiolitis typically affects children under the age of two, with a peak incidence between the ages of two and six months [5]. In our study, it was noticed that males were affected in both groups more than females, with most children affected being under the age of one. This was comparable to a study done by Syed et al. that showed a male preponderance of 80% among infants in the age group range of 30-90 days [5]. In a retrospective study of 70 children with RSV bronchiolitis, Saleh Ahmed et al discovered that the most affected age group was under 6 months, with males being more common than females [6]. The cohort study of Hemalatha et al. were made on 126 children who are suffering with the Lower Respiratory Tract Infection (LRTI). The most common age group which are affected was children under the age of one year, and males were disproportionately affected (56 were fallen RSV positive and rest 70 were negative) [14]. The average life of the 107 children in Iqbal et al studies were 11.35 months, with a male to female ratio of 1.3 [7]. In their prospective cohort study, Durani et al. found that the median patient age was 5 months and that 57% of the patients were male [8].

Most participants in our study had wheeze more common in the non-RSV group. The findings of Syed et al study were like ours in which coughing was the main symptom and wheezing was the main sign [5]. The study done by Iqbal et al. also had shown that 91% out of the 107 children had respiratory distress when they were first encountered [7]. Durani et al. observed that the mixture of cough, wheezing, and the retractions estimated that RSV infection in infants and also young children under age of 36 months in their prospective cohort study [8]. According to the etiological agent, no study found any differences in clinical presentation.

In this study, the prevalence of fever (above 100.4F) was comparatively high in the non-RSV group than in the RSV group, based on temperature measurements taken within the first 24 hours of admission. The first day in hospital admission were measured from the viral prodrome might show this difference. Kids in the Non-RSV batch may have reached at the hospital earlier or they may get antipyretics that we did not record in this study. Other few studies found that infants with bronchiolitis might be with a fever or a historical record of fever. High fever is very uncommon in bronchiolitis [9-11]. In this study, the RSV group had a longer duration of hospital stay.

Hemalatha et al. found that 99 out of 104 hospitalized patients were recovered well, in remaining five children three of whom had the RSV and two of them did not have fatal effects, and unfortunately, they passed away in their hospital [6].

Major part of this study results in terms of demographic and clinical profile were comparable to those of other studies, but the sample size in other studies was larger, which may have reduced the number of false negatives. However, most of the methods used in the studies were retrospective, which has its own set of drawbacks. Few studies well-used immunofluorescence, and others utilized PCR, both have its own different level of sensitivity and specificity.

LIMITATION

The cases were not well followed further to see which group was more doubtless to have recurring wheezing, but this could be done in coming studies. Also, this study limitation is in its little sample size, which may be part of the causes of untrue negative cases.

CONCLUSION

Fast breathing was significantly higher (57.5%) in non-RSV group. There was statistically significant wheezing in 68.8% of non-RSV cases and 31.3% of RSV cases. The significant statistically difference in other clinical parameters based on viral etiology. The duration of hospital stays, and oxygen therapy was found to be higher in RSV positive cases.

In children with bronchiolitis, clinical presentation and severity of disease didn't differ between RSV and non-RSV infections. Virological testing may not have a role in clinical diagnosis or management except for isolation or minimizing the use of antibiotics.

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