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ARTIGOS

RESPIRATORY SYNCYTIAL VIRUS (RSV) BRONCHIOLITIS: COMPARATIVE STUDY OF RSV GROUPS A AND B INFECTED CHILDREN

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The grouping characteristics of 29 respiratory syncitial virus (RSV) present in nasopharyngeal cells collected from hospitalized children with bronchiolitis during the 1990 RSV season in Porto Alegre, RS, were analysed. Twenty-two were grouped as belonging to group A and 7 to group B. Cyanosis, oxigen therapy, cough, lenght of hospitalization and atelectasis were observed to be more frequently found within group B infected children. Other clinical signs and symptoms were similarly found in both groups.

Key-words: Respiratory syncytial virus. Bronchiolitis. RSV groups A and B.

Respiratory syncytial virus (RSV) is the major cause of lower respiratory tract infections in infants and young children in the world[12]. It is the main cause of bronchiolitis and pneumonia in children under 6 months of age[7]. Annual epidemics are signalled by an increase in the number of children admitted to hospitals due to bronchiolitis and pneumonia. Two groups of RSV, A and B, had recently been described according to their reactivity with a panel of monoclonal antibodies (MAbs)[2 10]. Epidemiological studies have demonstrated that these 2 groups can cocirculate in annual epidemics in different regions of the world[1 5 9 14 18 20].

The recent identification of 2 groups of RSV has led to speculation that these groups may affect severity and recurrence. Studies pertinent to the clinical importance of RSV groups A and B provide limited information and conflicting results[5 13 15 21].

In this report, clinical aspects of RSV groups A and B were analysed in children under 1 year of age with bronchiolitis in which RSV was detected in clinical samples by immunofluorescence with a polyclonal RSV antiserum.

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MATERIALS AND METHODS

Specimens examined. This study included 128 children under 1 year of age with clinical diagnosis of bronchiolitis, hospitalized at two paediatric hospitals in Porto Alegre, RS, during the months of June, July and August, 1990. Nasopharyngeal secretions (NPS) were collected in the first seven days of illness by suction through a nasal catheter according to Gardner and McQuillin[3] and sent immediately at 4°C to the laboratory. The NPS were processed for rapid virus diagnosis by indirect immunofluorescence (IFAT) as described elsewhere[16], using a guinea-pig anti-RSV serum (FIOCRUZ, Brazil) and a fluorescein-conjugated rabbit antiguinea-pig serum (Sigma, USA). All samples were also tested for adenovirus by the IFAT. Duplicate slides were prepared and stored at -70°C, when the specimen was available in sufficient amounts.

These slides were sent to FIOCRUZ, RJ, for grouping by indirect immunofluorescence staining with monoclonal antibodies specific for group A (92-11c) and group B (102-10b) (kindly supllied by Dr. L.J. Anderson, CDC, USA). The dilution of MAbs and antimouse-FITC conjugated (Cappel, USA) were standardized as previously described[17].

Variables. Clinical observations included the presence of wheezing, fever, cyanosis, apnea at any time during hospitalization, the use of mechanical ventilation, lenght of hospital days and requeriment for intensive care. In the counting of hospital days,

the day of admission was counted as a full day. Chest X-ray observation included atelectasis, consolidation and hyperinflation.

Statistical analysis. The statistics analysis was made using chi square test.

RESULTS

From June to August, 1990, 128 children were hospitalized with clinical diagnosis of bronchiolitis. Most of the children were males (78.6%) aged 3-6 months. Clinical data more frequently found were wheezing, cough, high respiratory rate and cyanosis. X-ray findings frequently observed were hyperinflation and consolidation. The lenght of hospitalization of most the cases were less than seven days, and 9 children required intensive care.

From the 42 RSV positive cases, 29 were characterized in group A and group B. Twenty-two belonged to group A and 7 to group B. Table 1 shows the comparison of clinical and radiologic findings between the two groups. Cyanosis, atelectasis, and cough were frequent in group B infected children. Other signs and symptoms were similarly found in both groups. Almost all children received large doses of antibiotics and bronchodilator treatment but oxigen therapy was used mainly in group B (Table 2). The mean lenght of hospitalization from group A infected children was shorter than in group B infected ones. Five patients received blood transfusion because they had anaemia.

Table 1 - Comparison of RSV groups A and B infection in relation to clinical and X-ray findings in children with bronchiolitis.

	group A (n=22)	group B (n=7)
Clinical findings		
high respiratory rate	14	5
wheezing	19	6
fever	15	4
cough	17	7
cyanosis	4	3
crepitations	13	3
X-ray findings		
hyperinflation	18	6
atelectasis	5	3
consolidation	16	5

Table 2 - Comparison of therapeutic measures and days of hospitalization between RSV groups A and B infected children.

	group A (n=22)	group B (n=7)
Therapeutic measures		
antibiotic	14	4
oxigen	10	6
mechanical ventilation	2	2
bronchodilator by nebulizer	18	4
bronchodilator IV	13	5
blood transfusion	3	2
Days of hospitalization		
< 8 days	12	2
8 - 14 days	5	2
> 14 days	3	3

The statistical analysis was impaired by the small size of group B. In spite of this, the more objective data was tested using chi square test. No significant difference was found between group A and group B; there is no material difference for the three types of X-ray findings between the two groups (without Yates correction even). The test result ($X^2 = 0.056$; $p > 0.1$) is equally valid for the other data, the clinical findings including. For example, if the difference between A/B groups on less than 8 days of hospitalization (Table 2) was significant, this result depends on the more objective data - the X-ray findings.

DISCUSSION

The results described in the present paper are similar to several others from different countries that showed the simultaneous circulation of the two groups of RSV within the same community during the same RSV season. These studies have also demonstrated that the pattern of isolation of two RSV groups can vary from year to year[1,5,9,18]. RSV groups A and B appear to differ primarily in the largest surface glycoprotein, the G protein, whereas the other major surface glycoprotein, the F or fusion protein, is relatively well conserved[6]. For this reason, in the present work it was used

monoclonal antibodies specific for group A (92-11c) and B (102-10b) which recognize epitopes on the fusion protein of the virus[2].

Some reports suggest that antigenic differences between the two major groups of RSV isolates may be important in the clinical and epidemiologic features of RSV disease. Previous reports found conflicting results in analysing epidemiologic features and comparing lower and upper-respiratory-tract infections without presenting clinical variables. In a study of Hendry et al[5], there were no major differences in age, sex or frequency of nosocomially acquired RSV between infants infected with groups A and B, between one outbreak and that followed it, as well as into each outbreak. Waris[21] found that yearly hospitalization rate was not demonstrably dependent on group virulence and that both groups of RSV are epidemiologically equally important. In Rio de Janeiro, a retrospective study analysis of children infected with RSV, showed a predominance of group A in some years[18] but the rate of infections caused by A and B strains was the same both in hospitalized children and in less ill outpatient children (M.M. Siqueira, data not published). Other reports showed a predominance of group A infection among hospitalized children[9] and in those who required intensive care[4].

In this study, we analysed the A and B groups of children with brochiolitis. The clinical signs that indicates severity in acute bronchiolitis are cyanosis, crepitations and oxygen saturation (SaO_2) measurements[11]. Cyanosis was present in three children infected with RSV group B, but the presence of crepitations was not too different in both groups. SaO_2 measurement was not available in the present study. Intensive care as measured by oxygen therapy and mechanical ventilation as well as the lenght of hospitalization and atelectasis were more frequently in those children infected with group B RSV. Group B infection was correlated with more severity in some clinical variables, but the number of cases studied was few to establish difference in severity between the 2 groups.

Until now, few reports compared a great variety of background features, clinical signs and symptoms[8 13 15 19]. Data from larger numbers of children suggested that group A infection was more severe. Salomon et al[15] in 116 typed samples (A, n = 23; B, n = 93) from children under 2 years of age found that the presence of atelectasis and wheezing were significantly more common among the group A infected children, suggesting a more severe disease. Althought Russi et al[13] observed higher respiratory rates in group A infections, the number of children under 1 year of age was few (A, n = 14; B, n = 11) and they could not established a clear-cut difference in virulence.

For some studies cited, including the present one, the frequencies of RSV groups A and B were studied only at the hospital and were not compared with infection in the community. The conflicting findings from different investigators about severity and virulence of group A and B might reflect the use of different methods other than the absence or presence of a correlation. The controversial reports on the virulence of RSV groups point to the need to establish accepted standards to evaluate severity[13]. Analysis of the clinical signs and symptoms in hospitalized and outpatient children are in progress; further investigations of the clinical relevance of RSV groups are necessary.

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RESUMO

Estudos recentes de amostras do vírus respiratório sincicial (VRS) usando anticorpos monoclonais distiguiram duas variantes antigênicas, designadas como grupos A e B. Estes grupos foram estudados em 29 secreções de nasofaringe positivas para o VRS, provenientes de crianças hospitalizadas com bronquiolite durante surto de virose por VRS, em Porto Alegre, em 1990. Destas, 22 foram grupadas como pertencentes ao grupo A e 7 ao grupo B. Alguns achados clínicos como cianose, tosse, uso de oxigênio e dias de hospitalização foram mais freqüentemente observados em crianças infectadas com o grupo B do VRS. Outros sinais e sintomas clínicos foram similarmente encontrados nos 2 grupos.

Palavras-chaves: Vírus respiratório sincicial. Bronquiolite. Grupos A e B de VRS.

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