Incidence of respiratory diseases in hemodynamically significant congenital heart disease (hsCHD) children in Italy: the SINERGY study

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ABSTRACT

Introduction: Children affected by hsCHD are likely to experience several respiratory complications that increase the number of hospitalizations. Objectives of the SINERGY study were to describe the incidence of respiratory diseases, and infections information on the active and passive immunoprophylaxis during the first 2 years of life.

Methods: A prospective multicenter observational study involved 698 hsCHD children in 11 sites. Subjects affected by HIV or malignancies were excluded from the study. The first two years of life were analyzed. Data were collected through questionnaires filled in by physicians, through analysis of hospital database and parents interviews.

Results: 698 children were enrolled in the study. 65% boys, 55% born term, 70% weighing at birth, 18% presented a congenital anomaly. Neutrophil count at the admission was 7.2 ± 6.8 cells/l, the most frequent intercurrent bacterial defects (23% overall; 11% in combination with other cardiopathies) were: aortic valve defect (15% in combination and 9% in combination with other cardiopathies), chronic obstructive pulmonary disease (8% in combination and 11% in combination with other cardiopathies).

The overall incidence of any respiratory disease was 4%. The most frequent respiratory disease didn’t require hospitalization were acute bronchitis and pneumonia (7% and 6% of total), and bronchitis (7%), in particular treatment for bronchiolitis. Active immunoprophylaxes showed different degrees of compliance, probably due to the fact that the DTPa vaccine is mandatory in Italy, other vaccines are optional at parents discretion.

Conclusions: (1) Significant pulmonary hypertension, cardiacogenic, and/or polyp syndrome, and/or with use of immunosuppressive therapy; (2) Status of post-transplant heart.

INTRODUCTION

According to Italian National Health Organization estimates, approximately 20% of deaths in children younger than 5 years is caused by clinical manifestations of acute respiratory infections. Respiratory infections are important causes of hospitalization and chronic diseases during the first 2 years of life in children with congenital heart diseases. This is due to the fact that the most frequent complications observed in children with congenital heart diseases (hsCHD) are respiratory tract infections (64%), in particular pneumonia, and bronchiolitis (2-6 fold increase in hospitalization rate). The most frequent causes of bronchiolitis in children with hsCHD are either of viral etiology (Bronchiolitis due to Human respiratory syncytial virus, RSV) or due to RSV and Adenovirus infection. In children affected by hsCHD, respiratory tract infections are likely to be severe and require hospitalization. In the majority of the cases, respiratory tract infections are superimposed on chronic obstructive pulmonary disease and cardiacogenic pulmonary edema due to the presence of other cardiopathies.

METHODS

CONDUCT OF THE STUDY

Inclusion and exclusion criteria

MAIN EXCLUSION CRITERIA

Children presenting with neoplasia

MAIN INCLUSION CRITERIA

Children with hsCHD

OBJECTIVES

CONCLUSION

RESULTS

Table 1. Demographics and Clinical Characteristics

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Figure 3. Congenital heart diseases.

The main reasons for hospitalization in these high-risk children were acute bronchitis and respiratory tract infections (64%). In children affected by hsCHD, respiratory tract infections are likely to be severe and require hospitalization. In the majority of the cases, respiratory tract infections are superimposed on chronic obstructive pulmonary disease and cardiacogenic pulmonary edema due to the presence of other cardiopathies.

Figure 4. Active immunoprophylaxis.

The etiology of respiratory infections was confirmed only in patients with symptoms of respiratory tract infections with poor clinical outcome. The most frequent respiratory diseases were lower respiratory tract infections (64%), in particular pneumonia and bronchiolitis. Although respiratory tract infections are usually benign in course, high-risk individuals (such as children with congenital heart diseases) may experience severe complications that increase the number of hospitalizations and deaths.

• Studies conducted mainly in the United States and Canada demonstrated that children with congenital heart diseases face greater risks of severe respiratory syncytial virus (RSV) infections. Moreover RSV infection is associated with a 2- to 6-fold increase in mortality compared with cases without any further risk factors.

OBJECTIVES

Primary objective:

To analyze the number and type of respiratory diseases during the first 2 years of life in children aged 0-2 years

Secondary objective:

To describe which therapies, both active and passive immunoprophylaxis are given for the prevention of respiratory diseases in clinical practice in children with hsCHD that were being treated by hospital pediatric cardiologists.

METHODS

SINERGY is a multicenter historical cohort epidemiologic study (Figure 3).

The observation period is represented by the first 2 years of life of children born after 31 December 2003

Figure 1. SINERGY study design.

Figure 2. Congenital heart diseases.

The majority of the subjects presented with atrioventricular defects (63.1%), followed by obstructive lesions of the aorta (21%).

Figure 5. Anti-RSV immunoprophylaxis.

CONCLUSIONS

55% of subjects received anti-RSV prophylaxis with palivizumab.

Of the 15 hospitalizations for bronchiolitis (related to RSV infection or not), 27 (77%) occurred in children that did not receive palivizumab against RSV (or who received only the first dose before the event), whereas 8 hospitalizations (33%) occurred in children that received prophylactic treatment (P<0.001, Figure 5).

ACKNOWLEDGMENTS

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REFERENCES


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