

## Access in pediatric emergency department for respiratory infectious disease

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**ABSTRACT:** *Objectives:* The aim of this study was to evaluate the prevalence of respiratory symptoms as motive for emergency room visits by pediatric patients, describing the major clinical syndromes.

*Methods:* Study population is composed of children aged 1 month - 16 years who presented at our emergency room with respiratory symptoms, over a 5-year period (from September 2008 to December 2013).

*Results:* The first year of life age group was most affected by respiratory problems. During the first 4 months of life, male patients represented the larger number of pediatric emergency room visits for respiratory problems. Bronchospasm emerged as the most frequent (36%) respiratory problem.

*Conclusions:* We describe the epidemiological profile of pediatric patients presenting at an emergency room with respiratory symptoms, finding a high prevalence of access to pediatric emergency room for upper and lower respiratory infections.

**KEYWORDS:** Respiratory tract infection; respiratory symptoms; children; epidemiology; emergency room.

### 1 BACKGROUND

Respiratory tract infection (RTI) is a pervasive public health issue and a great burden to both families and society in general. Upper and lower respiratory tract infections are commonly encountered in the emergency department [1].

Infections of the upper or lower respiratory tract represent the most frequent infectious disease of all children. The pattern of RTI is variable and correlated to factors that include region, season, and year [2]. The majority of pediatric cases occur in children younger than 6 years of age [3]. Viral and bacterial pharyngitis generally affects children aged 4 to 7 years; epiglottitis affects children aged 3 years, while laryngotracheobronchitis usually occurs in the second year of life [4]. Children are most likely to have colds starting in September until April.

The aim of this manuscript was to evaluate the epidemiology of RTIs as the reason of access to pediatric emergency departments, describing the major clinical respiratory symptoms.

### 2 MATERIALS AND METHODS

This retrospective, transversal, observational study was conducted in the pediatric emergency department at the University Hospital of Messina, from September 2008 to December 2013.

Children between 1 month - 16 years old with respiratory symptoms were considered eligible for this study.

Clinical findings on admission (ear temperature, heart rate, respiratory rate, pulmonary auscultation findings, and SpO<sub>2</sub> - measured by digital pulse oximetry) were also recorded.

The parent(s) of each child provided written informed consent at the moment of the medical visit.

A single observer performed the data collection. Data were entered into a Microsoft Excel 2007 database, after which they were processed and analyzed with Medcalc (version 8.0) and GraphPad Prism (version 5.0) software, and expressed as percentages.

### **3 RESULTS**

A total of 1,041 children aged 1 month - 16 years were included in this retrospective investigation and diagnosed with RTI at our hospital between 2008 and 2013. There was an increase in the number of visits in December, January, and February. The first year of life age group is most affected by respiratory problems, especially between 9 and 12 months. During the first 4 months of life, male patients presented the larger number of pediatric emergency room visits for respiratory problems. Assessing the prevalence of respiratory problems, it emerged that bronchospasm was the most frequent (36%), followed by laryngospasm and bronchitis (18%, both). The incidence of pneumonia increases from 9 months of age onwards.

Among the different treatments prescribed, most were antipyretics and analgesics, and verbal or written instructions were given on how to manage development of upper airway colds. The second most frequent treatment prescribed was antibiotics.

### **4 DISCUSSION**

Epidemiological studies on pediatric emergencies usually focus on traumatology [5], rarely on RTIs, yet respiratory illnesses are common pediatric conditions that often require emergency treatment.

Viral agents usually cause RTIs, but they may also be bacterial in origin [6]. Eradication of these agents with adequate therapy is recognized as a necessity. The age of the child, epidemiology of pathogens and sensitivity of these to targeted therapy determine the choice of antibiotic. However, during the last few years, an increase in rates of antibiotic resistance has compromised the selection of empirical treatment for some RTIs [7].

Common upper respiratory tract infections include tonsillitis, laryngitis and rhinitis. Allergic rhinitis is another frequent respiratory condition caused by IgE mediated reaction against a variety of flogistic agents to which the immune system is sensitized [8]. Common lower RTIs include bronchitis, pneumonia and bronchiolitis [9]. A correct differentiation between upper and lower airway infections is essential for appropriate management [9].

Treatment is often only supportive, but specific management strategies for certain pathogens depend on age and clinical characteristics [7].

In a pediatric population, respiratory infectious episodes triggered by an allergic substrate are common. Respiratory viral infections are implicated in the development of childhood allergic sensitivity. It remains unclear whether infections directly impact the respiratory immune system in a way that results in asthma and atopy or infections simply uncover asthma in those predisposed to develop the disease [8].

Many studies have revealed a connection between body mass index (BMI) and allergic diseases, showing that BMI is related with bronchial reversibility and inflammation in children with allergic rhinitis and asthma, as a possible link between overweight and allergic phlogosis of the respiratory tract [10].

The present study has some methodological limitations. We included only patients presenting to the emergency room, and these probably represent cases that were more severe than those treated in primary care. In addition, the etiologic agent was not identified. However, despite these limitations, the study achieved its objective of showing the clinical characteristics of patients with respiratory symptoms.

In conclusion, we have described the epidemiological profile of pediatric patients presenting at an emergency room, finding a high prevalence of access for respiratory symptoms. This article represents, therefore, a starting point to encourage preventive measures against RTIs and to emphasize the importance of an adequate therapeutic approach, in order to combat growing antibiotic resistance in pediatric patients.

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