

ORIGINAL ARTICLE

Cross-Sectional Study to Determine the Most Common Cause of Breathing Difficulty in Children from 1 Month to 12 Years of Age

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ABSTRACT

Background: Breathing difficulties are most commonly encountered in children and potentially life threatening emergency presenting to a hospital. Having significant mortality and morbidity among children the causes of breathing difficulties are on the rise in Pakistan.

Objective: Objective of the study was to determine the most common cause of breathing difficulty in children from 1 month and 12 years of age. So as to guide our planning for primary and secondary prevention of those causes to prevent disease in our community

Methodology: This was a cross sectional study. 100 patients presented in Children Hospital Lahore emergency with breathing difficulty were selected on the basis of non-probability (purposive) sampling. Study was completed in 3 months. Questionnaire was made to collect data and their detailed history was then taken including symptoms at presentation

Results: The common causes of breathing difficulty in our subjects were Pneumonia 40%, bronchitis 29%, Asthma 14%, sepsis 7%, Hyper respiratory distress syndrome 2%, hypercapnia tetani 2%, Diabetic ketoacidosis (DKA) 2%, encephalitis 2%, foreign body obstruction 1%, croup 1%. 2

Conclusion: The most common cause of breathing difficulty in children from 1 month to 12 years of age was Pneumonia.

Keywords: Croup, Pneumonia, Bronchitis, DKA.

INTRODUCTION

Disorders of respiratory tract are common illness of childhood. Most respiratory illness are self limiting minor infection but are few present as potentially life threatening emergencies in these acute diagnosis and prompt initiation of appropriate treatment are essential if unnecessary morbidity and mortality are to be avoided. Most children with breathing difficulties will have upper or lower respiratory tract illness. There are disorders outside the respiratory system that may cause apparent breathing difficulty such as cardiac disease, poisoning and metabolic and neurological disorders. (1)

Severe respiratory illness may result in the development of respiratory failure, defined as inability of physiological compensatory mechanism to ensure adequate oxygenation and carbon dioxide clearness, resulting in either arterial hypoxia hypercapnia or both.(2). Despite advances in the management of respiratory illness, they still resulted in almost 200 deaths in children between the ages of 4 weeks and 14 years in England and Wales in 2009. In 2008, pneumonia occurred in

approximately 156 million children. It resulted in 1.6 million deaths, or 28–34% of all deaths in those under five years, out of which 95% occurred in the developing world. It is the leading cause of death among children in low income countries. (3) Globally, pneumonia alone accounts for nearly 20% of deaths in children under 5 year old. Acute viral laryngo trachea bronchitis is the commonest form of croup and accounts for over 95% of laryngotracheal 3 infections (4). Bronchiolitis is the most common cause of hospitalization up to the first year of life. It is epidemic in winters.(5). As of 2011, 235–300 million people worldwide are affected by asthma, and approximately 250,000 people die per year from the disease. Rates vary between countries with prevalence between 1 and 18%.(6) In 1997-98, 5.4 percent of all children in the U.S. had asthma, according to EPA's America's Children and the Environment.(7) In about 20 million people who have asthma, nearly 9 million of them are children. Children have smaller airways than adults, which makes asthma especially serious for them. (8)

Croup affects about 15% of children, and usually presents between the ages of 6 months and 5–6 years.(9) It accounts for about 5% of hospital admissions in this population. In rare cases, it may occur in children as young as 3 months and as old as 15 years.(10) Males are affected 50% more frequently than are females, and there is an increased prevalence in autumn.(9).

Clinical presentation of child with breathing difficulty may include breathlessness, cough, noisy breathing (stridor, wheez), chest pain as respiratory presentations and fever, poor feeding, abdominal pain, change in color (cyanosis), disturbed conscious level as non-respiratory.(11)

In our community it is of major public health interest to assess the distribution of common causes of respiratory illness to assist planning for preventive interventions and case management at community and facility levels, including vaccine and antibiotic needs and delivery.4

OBJECTIVE

Objective of the study was to determine the most common cause of breathing difficulty in children from 1 month and 12 years of age in our community.

MATERIALS & METHODS

Design and Settings: This was a cross sectional study. 100 patients presented in Children Hospital Lahore emergency with breathing difficulty were selected on the basis of non-probability (purposive) sampling. The study was completed in three months.

Data Collection Procedure: A questionnaire was made to collect data. It included all the information regarding the respiratory distress. It also included that if there is any other medical illness present in the patients.

Sample Selection Criteria: Patients presented at the Emergency Department of the Children Hospital Lahore with respiratory distress aged 1 month to 12 years were included. Patients presented at the emergency department of the Children Hospital Lahore without respiratory distress and who brought dead were excluded in this case group.

Statistical Analysis: Both descriptive and inferential statistical analyses were done in Statistical Package for Social Sciences (SPSS) version 16.0. We had access to the original raw data for all of the clinical trials, and these data

were combined to perform the analyses. Categorical data are presented as percentages and in forms of graphs while descriptive and frequency distributions were used for quantitative data.5

REUSLTS

In this random study of 100 children conducted at Children Hospital Lahore the results thus we obtained showed that 64% were males and 36% were females. Mean age of 100 patients was 2.02 years (± 2.697 S.D) and no significant difference was seen between males and females regarding mean age. Most of the subjects were from urban areas. Common presenting complains were also observed. Throughout shortness of breath was the most common presenting complaint in our subjects (89% of the subject). Cough was observed in 64% of the subjects. 75% of our subjects were having fever at the time of their presentation. Cyanosis was seen in 33% children. Wheezing was not so common although 18% of our subjects were having wheezing at the time of their presentation. GI abnormalities i.e. diarrhea and vomiting were observed in 14% of children, possibly due to sepsis. Some of them were having difficulty in feeding. Other less common presentations which were observed include lethargy, febrile chest movements, stridor

and chest pain. The common causes of breathing difficulty in our subjects were Pneumonia (40%) following bronchitis (29%), Asthma (14%) and sepsis (7%). Making a complete study of 100 patients other causes that we found less significant in our subjects were hyper respiratory distress syndrome (2%), hypercapnia tetani (2%), diabetic ketoacidosis (2%), encephalitis (1%), foreign body obstruction (1%) and croup6 (1%). Only a single subject was presented with ventricular septal defect (1%). The number of subjects who were having more than one cause of breathing difficulty was not significant. Table-1 summarizes the causes of breathing difficulty and presenting complaint.

CAUSES OF BREATHING DIFFICULTY

Variables N=100 Relative Frequency

Pneumonia 40 0.40
Bronchitis 29 0.29
Asthma 14 0.14
Sepsis 7 0.07
Other * 10 0.10

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PRESENTING COMPLAINT

Shortness of breath 89 0.89

Fever 75 0.75

Cough 64 0.64

Cyanosis 33 0.33

Wheezing 18 0.18

Vomiting/diarrhea 14 0.14

Stridor 2 0.02

Chest Pain 2 0.02

Lethargy 7 0.07

* Hyper respiratory distress syndrome (2%), hypercapnia tetani (2%), diabetic ketoacidosis (2%), encephalitis (1%), foreign body obstruction (1%) and croup (1%), VSD (1%). 7

DISCUSSIONS

In our study we reported Pneumonia 40% and Asthma 14%. These results were closely relate to previous studies who reported pneumonia, asthma and croup as the major causes of respiratory distress in children (12),(13). 29% of our cases were presented with bronchitis as a cause of breathing difficulty in children. Burney et al(14) reported wheeze on most days or nights (boys, 4.3% per cohort, p less than 0.001; girls, 6.1% per cohort, p less than 0.001) Von Mutius et al (15) also reported a high prevalence of diagnosed bronchitis in his study. American academy of allergy asthma and immunology reported 10% children with breathing difficulty in 2009. Burney et al reported within age groups trends in successive annual cohorts showed an increasing prevalence of asthma for each annual birth cohort. Williams and McNicol (16) reported 11% of all children aged 10 years had some asthmatic episodes. We reported 13% cases of asthma as a cause of respiratory distress in children; these results were similar as that of previous studies(14),(16). We reported 7% sepsis in our cases this percentage was slightly lower than that of Flori et al (13) who reported 13% sepsis in their cases. This was due to the fact that we studied small sample unit. Our study had some limitations. First, the sample size was small but even with this sample size we were able to demonstrate the causes of breathing difficulties in children that were observed in western countries using very large sample sizes. Second, the decision of whether or not a patient had breathing difficulty was based on self report of the patient. Although it is not the best method but it is reliable. We assumed that using self reporting for measuring these variables would not generate

results much different from 8 those obtained using more sophisticated techniques e.g. physical examination and laboratory studies.

CONCLUSION

The most common cause of breathing difficulty in children was pneumonia following bronchitis and asthma in our study. About 2 million pneumonia deaths occur each year in children aged less than 5 years, mainly in the African and South East Asia Regions. The main bacterial causes of clinical pneumonia in developing countries are *S. pneumoniae* and *Hib*, and the main viral cause is respiratory syncytial virus, but estimates of their relative importance vary in different settings. The only vaccines for the prevention of bacterial pneumonia (excluding pertussis) are Hib and pneumococcal vaccines. Despite the lack of data, in our community, morbidity and mortality estimates and the main causative factors presented in this review could contribute to an understanding of the burden of acute respiratory infections in children and to informed care and vaccine policy. Above all, we must not lose sight of the heavy infant and child mortality burden facing Pakistan's families; the introduction of the pneumococcal vaccine represents an important milestone in the fight to reduce this burden. 9

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