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An out-patient survey of wheezing pediatric patients

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ABSTRACT

Background: Literature reports that approximately one in three children have at least one episode of wheezing prior to third birthday, and the cumulative prevalence of wheeze is almost 50% at the age of 6 years. Hence, an out-patient survey was planned and commenced to evaluate the common causes of wheezing in paediatric patients.

Methods: An out-patient survey of wheezing was conducted among 140 patients who reported with conditions giving rise to wheezing. These cases were investigated relevantly and followed upto 3 months. Obtained data was arranged according to characteristics and was expressed as a number and percentage of respondents and were analyzed using the SPSS Version 17 software.

Results: Bronchial asthma was diagnosed in 80 patients, worm infestation in 20, acute bronchiolitis in 12, tropical eosinophilia in 10, post measles bronchopneumonia in 8, acute bronchitis in 7 and primary complex in 3 patients. Maximum patients of bronchial asthma (69%), worm infestation (75%) and tropical eosinophilia (70%) were in 5-9 years age group. Maximum patients in case of bronchiolitis were in 7-12 months age group.

Conclusions: An out-patient survey revealed wheezing or noisy breath as one of the common symptoms with which children are brought to out-patient. The present study found apart from bronchial asthma, acute respiratory infections, worm infestations, and tropical eosinophilia constituted large percentage of cases.

Keywords: Asthma, Pediatric patients, Wheezing

INTRODUCTION

Literature reports that approximately one in three children has at least one episode of wheezing prior to third birthday and the cumulative prevalence of wheeze is almost 50% at the age of 6 years.¹

During the act of inspiration air enters the alveoli through larynx, trachea, bronchi and during expiration in the opposite direction. Vibrations caused by the passage or movement of air through these structures results in the production of respiratory sound. Normally inspiration is active effort while expiration is passive, short about one third of inspiration, and is assisted by elastic recoil of lung. Any factor that causes obstruction of air-way by obstructing the lumen or causing extrinsic pressure, the

difficulty in respiration is experienced during inspiration and well as in expiration.² The upper the site of obstruction like larynx, trachea, more is the inspiratory dyspnea, thus producing harsh vibratory high pitched shrill, crowing noise, which is known as 'stridor'. Inspiratory dyspnea is associated with expiratory distress because during expiration due to increased intrathoracic pressure, the bronchiolar lumen further narrows. The more peripheral the obstruction to the airway the more is the difficulty expressed during expiration resulting in hissing sound which is known as wheezing.³ Thus obstruction to the airway whether upper or lower the difficulty in breathing is experienced, both during inspiration and expiration. However because of the natural recoiling during expiration greater effort is needed during the act. Expiratory thoracic muscles compress the lower chest, abdominal muscles contract pushing diaphragm up in an attempt to squeeze the air out of the lung resulting in raised intrapulmonary pressure, the air now escapes under high pressure through the narrowed bronchial lumen producing cooy sound.⁴ In view of this, an out-patient survey was planned and commenced to evaluate the common causes of wheezing in pediatric patients.

METHODS

An out-patient survey of wheezing was conducted during the month of December 2007 during this period all the out-patient doctors were requested to refer cases presenting with complaint of noisy breathing or wheezing to "Asthma clinic". The study comprised of 140 patients of age group of 2 months to 14 years randomly selected who reported with conditions giving rise to wheezing. Ethical approval was obtained from the institute. Informed consent was obtained from the parents or guardians of the pediatric patients. These children were investigated after taking family, dietetic, allergic and helmenthic history. Most of the mothers brought their infants with the complaint of noisy breathing but when examined many of them were either transmitted throat sounds or there was nasal block without any lung signs. On an average about 4-5 cases per day were coming to an out-patient of 80-90 cases per day with this complaint. These cases were investigated relevantly and followed upto 3 months. Obtained data was arranged according to characteristics and was expressed as a number and percentage of respondents and were analyzed using the SPSS Version 17 software.

RESULTS

Figure 1 shows distribution of out-patient cases according to aetiology. Bronchial asthma was diagnosed in 80 patients, worm infestation in 20, acute bronchiolitis in 12, tropical eosinophilia in 10, post measles bronchopneumonia in 8, acute bronchitis in 7 and primary complex in 3 patients.

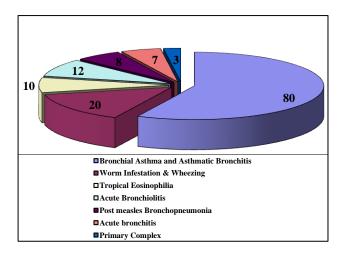


Figure 1: Distribution of out-patient cases according to aetiology.

Table 1: Distribution of patients according to age.

Age	Patients	Percentage
Bronchial asthma		
1-4 Years	12	15%
5-9 Years	55	69%
10-12 Years	13	16%
Bronchiolitis		
2-3 Months	2	16.7%
4-6 Months	3	25%
7-12 Months	4	33.3%
1-2 Years	3	25%
Worm infestation		
1-4 Years	4	20%
5-9 Years	15	75%
10-14 Years	1	5%
Tropical eosinophilia		
1-4 Years	1	10%
5-9 Years	7	70%
10-14 Years	2	20%

Table 1 describes the distribution of patients according to age. Maximum patients of bronchial asthma (69%), worm infestation (75%) and tropical eosinophilia (70%) were in 5-9 years age group. Maximum patients in case of bronchiolitis were in 7-12 months age group. Among 80 cases of bronchial asthma, 50 were male patients and 30 were female (Figure 2).

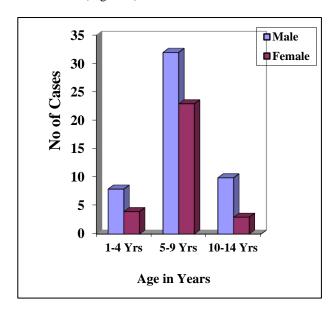


Figure 2: Age and sex wise distribution of bronchial asthma.

Among 12 cases of bronchiolitis, 6 cases were male and 6 cases were female (Figure 3).

Among 20 cases of worm infestation, 13 were male and 7 were female (Figure 4). Among 10 cases of tropical eosinophilia, 6 were male and 4 were female.

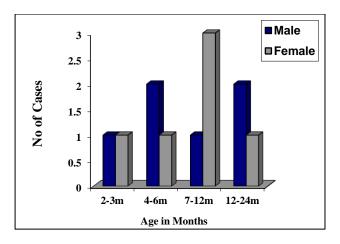


Figure 3: Age and sex wise distribution in bronchiolitis.

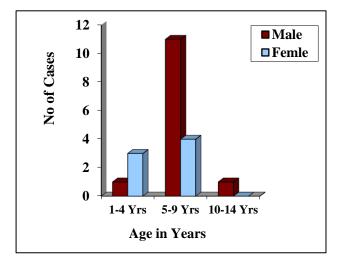


Figure 4: Age and sex wise distribution in worm infestation.

DISCUSSION

Wheeze is a whistling sound from the chest on breathing out. Wheeze is a classic sign of asthma but there are also other causes of wheeze in children. In very young children wheezing is most commonly related to a viral infection. In fact, among pre-schoolers with repeated bouts of wheezing, only 30% will have asthma at six years of age. However, at a young age it is difficult to know whether or not your child will have asthma at six years of age.⁵

In the present study, bronchial asthma was diagnosed in maximum number of wheezing patients. The aetiology, pathophysiology, natural history and presentation of childhood asthma are so variable and complex that a universally acceptable definition cannot be reached at. According to WHO, asthmatic bronchitis, allergic bronchitis, bronchial asthma, all these three entities are to be included under the terminology of bronchial asthma. ⁶

To the patients and parents, asthma means breathlessness with wheeze in respiration, no matter what the cause is.

The allergists think first of bronchospasm due to specific hyperresponsiveness. Clinicians have tended to prefer definition based on a variety of symptoms and expiratory flow rates, the pathologist in contrast have inclined towards the histo pathological changes and to the psychiatrist it is primarily a psychosomatic disorder indicating psychological maladjustment. Thus, asthma may defined as a diffuse, obstructive lung disease with hyperreactivity of the airways to a variety of stimuli. A high degree of reversibility of the obstructive process, which may occur spontaneously or as a result of therapy.

It has been time and again stated that asthma in childhood continues to be under diagnosed and untreated while labels such as 'wheezy bronchitis', 'asthmatic bronchitis', 'allergic bronchitis', 'wheeze associated respiratory illness' are frequently used to spare the parental anxiety. Asthma is often known as reactive air way disease with the asthma complex including wheezy bronchitis, asthmatic bronchitis, viral associated wheezing and atopy related asthma.⁹

The American Thoracic Society defines asthma as a disease characterized by increased responsiveness of the trachea and bronchi to various stimuli and is manifested by a wide spread narrowing of the airways that change in severity spontaneously or as a result of therapy. ¹⁰

Tabachnik E et al stated that any baby with recurrent episodes of wheezing (3 or more) be considered as having asthma; regardless of age of onset, evidence of atopy, apparent precipitating cause of wheeze or frequency of wheeze. ⁴ This definition excludes specific causes of wheeze other than asthma.

Skoner et al for practical purposes defined asthma as , three or more episodes of reversible bronchospasm (i.e acute onset of wheezing and airway obstruction that lessens after therapy). Children in population that migrate to urban area from rural areas begin to experience a much higher prevalence of asthma when followed over a period than similar children who remain in the rural areas. The urbanized environment increases exposure to new allergens irritants.

Thus present study found that apart from bronchial Asthma, acute respiratory infections, worm infestations, and tropical eosinophilia constituted large percentage of cases. Bronchiolitis cases have an "asthmatic diathesis" few authorities consider bronchiolitis as infantile manifestation of bronchial asthma.¹³ So these infants who present with a picture of bronchiolitis must be watched for asthmatic attacks in later childhood.

Other causes of wheezing in children are infections, postviral wheezing, tuberculosis (e.g. glandular compression of airways), HIV disease (e.g. lymphocytic interstitial pneumonia), congenital/perinatal problems, tracheomalacia, cystic fibrosis, chronic lung disease of the newborn, congenital malformation causing narrowing of the intrathoracic, airways, primary ciliary dyskinesia syndrome, immune deficiency, congenital heart disease, mechanical problems, foreign body aspiration and gastro-oesophageal reflux disease (GORD).¹⁴

CONCLUSION

An out-patient survey revealed wheezing or noisy breath as one of the common symptoms with which children are brought to out-patient. The present study found apart from bronchial asthma, acute respiratory infections, worm infestations, and tropical eosinophilia constituted large percentage of cases. Wheezing is a symptom of many diseases the cause of which must be thoroughly investigated for proper management of the case. Because of the small size of bronchi and abundency of lymphoid tissue and relatively frequent infections, allergic disorders during childhood, the air-way is more prone to obstruction resulting in difficulty not only during inspiration, but much more so in expiration.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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