

## CLINICAL SPECTRUM OF WHEEZING IN PEDIATRIC PATIENTS: A TERTIARY CARE EXPERIENCE

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### ABSTRACT

**Background:** Globally one in three children experiences at least one episode of wheezing before their third birthday, and the cumulative prevalence of wheeze reaches almost 50% by the age of 6 years. The respiratory sound produced during the passage of air through the larynx, trachea, and bronchi is a result of vibrations caused by air movement. **Material & Methods:** The present cross sectional, prospective study was carried out at department of pediatrics, at our tertiary care hospital. The study duration was of six months from July 2016 to December 2016. In this prospective study we enrolled 100 children of age group of 2 months to 14 years presented at outpatient department with conditions giving rise to wheezing and enrolled by simple random sampling. **Results:** Out of the total enrolled children 58% were males and 42% were females. Mean weight of study participants was  $16.3 \pm 2.4$ kg. Out of total, 21% were in group of less than 5years, 27% were in the age group of 5-10 years, 52% were in the age group of 10-15 years. On the basis of clinical presentation of children with wheezing it was found that 72% bronchial asthma, 8% children were diagnosed with bronchiolitis, 14% children were diagnosed with worm infestations and 6% children were diagnosed with tropical eosinophilia. There was no mortality reported in present study. **Conclusion:** We concluded from the present study that, on the basis of clinical presentation of children with wheezing it was found that bronchial asthma, bronchiolitis, worm infestations and tropical eosinophilia were major clinical diagnosis.

**Keywords:** Wheezing, Asthma, Pediatric patients.

### INTRODUCTION:

Globally one in three children experiences at least one episode of wheezing before their third birthday, and the cumulative prevalence of wheeze reaches almost 50% by the age of 6 years (1). The respiratory sound produced during the passage of air through the larynx, trachea, and bronchi is a result of vibrations caused by air movement (2). In the normal respiratory process, inspiration involves an active effort, while expiration is passive,

shorter, and assisted by the elastic recoil of the lungs, constituting about one-third of the inspiration time (3).

Any factor obstructing the airway, either by lumen blockage or extrinsic pressure, can cause respiratory difficulties during both inspiration and expiration (4). The location of the obstruction, whether in the upper airway like the larynx or trachea, influences the type of respiratory distress experienced (5). For

instance, an upper airway obstruction results in inspiratory dyspnea, characterized by a harsh, vibratory, high-pitched, shrill noise known as "stridor." Inspiratory dyspnea is often associated with expiratory distress, as increased intrathoracic pressure during expiration further narrows the bronchiolar lumen (6).

The more peripheral the airway obstruction, the greater the difficulty during expiration, leading to a hissing sound known as wheezing (7). Whether the obstruction is in the upper or lower airway, it causes breathing difficulties during both inspiration and expiration. Due to natural recoiling during expiration, additional effort is required during this phase (8).

Expiratory thoracic muscles compress the lower chest, while abdominal muscles contract to push the diaphragm upward, attempting to expel air from the lungs and resulting in increased intrapulmonary pressure. The air escapes under high pressure through the narrowed bronchial lumen, producing a characteristic "coo" sound. In light of these respiratory dynamics, present study was conducted as an outpatient department study to evaluate the common causes of wheezing in pediatric patients.

## **MATERIALS & METHODS**

The present cross sectional, prospective study was carried out at department of pediatrics, at our tertiary care hospital. The study duration was of six months from July 2016 to December 2016. A sample size of 100 was calculated at

95% confidence interval at 10% acceptable margin of error by epi info software version 7.3. In this prospective study we enrolled 100 children of age group of 2 months to 14 years presented at outpatient department with conditions giving rise to wheezing and enrolled by simple random sampling. Institutional Ethics Committee Clearance was obtained before start of study and written and informed consent from their mother and father for the study was obtained from all the patients. Strict confidentiality was maintained with patient identity and data and not revealed, at any point of time.

These cases were investigated as per study guideline and follow up period was of 3 months. All data were entered in the MS office 2010 spread sheet and Epi Info v7. Data analysis was carried out using SPSS v22.

Qualitative data was expressed as percentage (%) and Pearson's chi square test was used to find out statistical differences between the study groups and sensitivity, specificity, positive predictive value and negative predictive value were calculated. If the expected cell count was < 5 in more than 20% of the cells then Fisher's exact test was used. All tests were done at alpha (level significance) of 5%; means a significant association present if p value was less than 0.05 and highly significant if p value less than 0.01.

## RESULTS

In the present study, we enrolled 100 children of age group of 2 months to 14 years presented at outpatient department with conditions giving rise to wheezing by simple random sampling. Out of the total enrolled children 58% were males and 42% were females. Mean weight of study participants was  $16.3 \pm 2.4$ kg. Out of total, 21% were in group of less than 5years, 27% were in the age group of 5-10 years, 52% were in the age group of 10-15 years. (Table 1)

**Table 1: Distribution of study participants according to study parameters.**

Parameters		No. of patients
Gender	Male	58%
	Female	42%
Age group	< 5years	21%
	5-10 years	27%
	10-15 years	52%

**Table 2: Distribution of study participants according to clinical presentation.**

Parameters	No. of patients
Bronchial asthma	72%
Bronchiolitis	8%
Worm infestations	14%
Tropical eosinophilia	06%

In the present study, out of total enrolled participants, on the basis of clinical presentation

of children with wheezing it was found that 72% bronchial asthma, 8% children were diagnosed with bronchiolitis, 14% children were diagnosed with worm infestations and 6% children were diagnosed with tropical eosinophilia. There was no mortality reported in present study. (Table 2)

## DISCUSSION

In the present study, we enrolled 100 children of age group of 2 months to 14 years presented at outpatient department with conditions giving rise to wheezing by simple random sampling. Out of the total enrolled children 58% were males and 42% were females. Mean weight of study participants was  $16.3 \pm 2.4$ kg. Similar findings were reported in a study conducted by Ahmed SKN et al conducted to assess the children with wheezing disorders and found that Bronchial asthma was identified as the diagnosis in 80 patients, while 20 patients presented with worm infestation. Additionally, 12 cases were diagnosed with acute bronchiolitis, 10 with tropical eosinophilia, 8 with post-measles bronchopneumonia, 7 with acute bronchitis, and 3 with primary complex (9).

In the present study, out of total, 21% were in group of less than 5years, 27% were in the age group of 5-10 years, 52% were in the age group of 10-15 years. Similar findings were reported in a study conducted by Ranabir Pal et al conducted to assess the children with wheezing

disorders and found that mean prevalence of childhood asthma was  $7.24 \pm SD 5.42$ , with a median prevalence of 4.75% [interquartile range (IQR) = 2.65 – 12.35%]. The overall weighted mean prevalence was determined to be 2.74. Interestingly, childhood asthma was found to be lower among children aged 13–14 years compared to younger children aged 6–7 years. These prevalence figures provide insight into the occurrence of asthma in the studied population, with variations observed across different age groups (10).

In the present study, out of total enrolled participants, on the basis of clinical presentation of children with wheezing it was found that 72% bronchial asthma, 8% children were diagnosed with bronchiolitis, 14% children were diagnosed with worm infestations and 6% children were diagnosed with tropical eosinophilia. There was no mortality reported in present study. Similar findings were reported in a study conducted by Dieter Ukena et al conducted to assess the children with wheezing disorders and found that long-term treatment with inhaled corticosteroids serves as a cornerstone in the management of asthma, complemented by preventive measures and patient education. In addition to long-term control, bronchodilators, such as beta2 sympathomimetic, play a crucial role in providing rapid symptomatic relief during acute asthma attacks. The combination of these

approaches aims to achieve effective asthma control, reduce exacerbations, and enhance the overall quality of life for individuals living with asthma (11).

## CONCLUSION

We concluded from the present study that, on the basis of clinical presentation of children with wheezing it was found that bronchial asthma, bronchiolitis, worm infestations and tropical eosinophilia were major clinical diagnosis. There was no mortality reported in present study.

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