

Demographic and Clinical Profile of Children Under Two Years of Age with Recurrent Wheezing

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ABSTRACT

Sixty-seven children less than two years of age with recurrent wheezing were evaluated clinically and demographically by proper history and clinical examinations. The mean age of the study subjects at enrolment and at onset of wheezing was 10.8 ± 5.24 months and 7.1 ± 3.857 months, respectively. The male-female ratio was 9:2. The majority of these cases (82%) had onset of wheezing at less than 1 year of age. One-third of the cases were diagnosed as asthma and viral infection associated wheeze. Increasing age in the first 2 years of life was significantly associated with decreasing trend of cases with history suggestive of reflux. The children with wheeze due to causes other than gastroesophageal reflux were more likely to be not exclusively breast fed. The present study did not find any significant difference in the prevalence of various socioeconomic, environmental factors and clinical factors among the various types of the early wheezers.

Key words: Child. Asthma. Wheeze.

Wheezing in infants is the presenting complaint of many diseases rather than a disease itself. Wheezing is very common in young children due to age specific anatomical and physiological properties. Twenty percent of all children will have had one episode of wheeze by 1 year of age, 35% will wheeze at least once before the age of 3 years and nearly 50% by 6 years of age.¹ There are many studies which have described the prevalence and predictive role of various demographic, socio-economic and clinical parameter which can be used as distinguishing factors between different types of recurrent wheezing, specially atopic and nonatopic wheezing.²⁻⁵ The present study aimed to evaluate the role of these factors in early childhood wheezers.

The study was conducted in the Department of Pediatrics, of a tertiary level hospital at New Delhi, from January 2007 to April 2008.

Inclusion criteria included all the patients between 0-2 years of age who presented with recurrent or persistent wheezing, defined as more than 3 significant attacks of wheeze within last 6 months, requiring visit to hospital (recurrent wheezers) or those with lesser number of episodes or less severe disease but the wheeze persists almost daily for more than 4 weeks in the current episode (persistent wheezers); having normal / near

normal chest radiographs and irrespective of their atopic status. Cases with extreme prematurity (birth weight < 1500 grams); neurological or developmental disorders, tuberculosis, bronchiectasis, congenital heart disease, congenital anomalies related with high risk of gastroesophageal (GE) reflux (tracheo-esophageal fistula, etc.) and known or suspected immunodeficiency were excluded.

Detailed history and clinical examination was done in all the cases. The patients underwent baseline investigations like hemogram, total leukocyte counts and absolute Eosinophil counts, chest radiograph, Mantoux test and total serum IgE. Gastroesophageal reflux was also evaluated by either GI Scintiscan or 24 hours pH monitoring.

The cases who had personal or family history of atopy with or without eosinophilia and also had history of cough/ wheeze without "colds", were diagnosed as probable asthma.

The cases who had cough, coryza and fever (viral prodrome) along with wheezing each time with or without a history of similar viral illness in a family member, were diagnosed as viral-associated wheeze (VAW).

Those cases who showed positive results in any of the investigations directed for GER, were diagnosed as a case of GER.

Chi-square test was used for qualitative data in this study and we considered the results as significant when p-value was ≤ 0.05 . We used Statistical Package for Social Sciences (SPSS) version 12 software for analysis of the results.

Ninety successive children of less than 2 years with recurrent wheezing, who were admitted in the study unit

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were enrolled within the study period. Sixty seven of them completed the study according to the study protocol.

Mean age of the study subjects at enrolment was 10.8 ± 5.24 months. Only 18% cases were female while male cases predominated (82%). Mean age of onset of wheezing was at 7.1 ± 3.857 months of age. The majority of these cases (82%) had onset of wheezing at less than 1 year of age; while over half had onset by 6 months of age. About one-third of the cases were diagnosed as Asthma and VAW. GER studies were positive in over one-third of cases (37%).

Fifty four percent of the children with recurrent wheeze were from families with poor socio-economic status. Thirty percent cases had history of exposure to passive tobacco smoking. There were almost equal proportions of babies with exclusive breast feeding or bottle feeding in the study group irrespective of their final diagnosis.

Thirty seven percent of the cases had at least one of the tests positive for GER, though only 28% of the study population had history suggestive of reflux. Family or personal history of asthma and/ or atopy was present in 25% of the cases. Most of the patients (95%) who had history suggestive of reflux had onset of wheezing before 1 year of age, 75% of children had onset < 6 months of age. There was a statistically significant decreasing trend of cases with history suggestive of reflux with increasing age in first 2 years of life.

Most of the patients (70%) in the study had symptoms of enough severity so that they needed to be admitted or treated in ER (19%) for their management. Mean age of GER positive group was lower than those without GER. This was also true for age at onset of wheezing among these groups. There was higher male-female ratio in the group of patients without GER. The mean frequency of attack between these groups at time of enrolment was almost equal, however, the patients with GER were more likely to have severe disease ($p < 0.001$). The GER group obviously had more number of patients with history of reflux. The children with wheezing due to causes other than GER were more likely to be not exclusively breast fed. No other feature was useful as a discriminator between those who had GER vis a vis those without it (Table I).

The present study found a clear male preponderance in the study subjects. An earlier study on early childhood wheezing had also reported a similar male preponderance and concluded that male gender is a risk factor for asthma in pre-pubertal age.^{2,3} However, this may also be in part due to preferential help seeking behaviour in the community for the male gender. The early onset of wheezing was also similar to previous study by Mallol *et al.*⁴

Table I: Comparison of the various clinic-investigative profiles between the cases who have positive GER study with those patients with negative GER study.

Clinico-investigative profile	GER positive (n = 25)	GER negative (n = 42)	p-value
Mean age	10.2 month	11.14 month	$p < 0.001$
Gender distribution (M:F)	M:F= 18:7 (2.6:1)	M:F= 37:5 (7.4:1)	$p < 0.001$
Mean age at onset	5.9 month	7.7 month	$p < 0.001$
Suggestive history of reflux (n = 19)	13	6	$p = 0.001$
History of asthma/ atopy (n = 17)	7	10	$p=0.459$
Severity (severe: moderately severe: mild)	21:3:1	26:10:6	$p < 0.001$
Mean frequency of attack before enrolment	4.8	4.7	$p = 0.068$
Family income < Rs. 5000/m in the (n=36)	10/25 (40%)	26/42 (62%)	$p=0.069$
Exclusive breast feeding (n = 30)	15/25 (60%)	15 (38%)	$p = 0.046$
Bottle feeding (n = 27)	9	18	$p = 0.385$
Environmental factors (n = 27)	7	20	$p = 0.092$
Poor response to bronchodilator	7/25 (28%)	6/42 (14%)	$p = 0.146$

The cases with GER had started wheezing earlier than group without any evidence of GER and the mean age of presentation of GER group was less compared to non-GER group ($p < 0.001$). The non-GER wheezers were less likely to be exclusively breast fed as compared to the GER group, suggesting a possible protective role of exclusive breast feeding on early wheezing. Twenty five percent of the enrolled cases had personal and/or family history of asthma/atopy which was similar to a study by Rusconi *et al.* who also found that both eczema and allergic rhinitis were risk factors for all conditions of wheezing.⁵ In this study group, predominant symptoms of GER were spitting, regurgitation of feeds, vomiting and wheezing and cough. The relationship between GER and history suggestive of GER was found to be significant.

Previously most of the studies have tried to differentiate between atopic and non-atopic wheezers among the early wheezers to predict who and how many will go on to develop asthma later in life and few studies also found relevant association between type of wheeze with clinical demographic factors. But in this study, those patients who had early age of onset of wheeze and had history and clinical symptoms suggestive of GER, only had a higher proportion of wheezing due to GER. Other than this, there were no demographic and clinical factors identified as a useful discriminant between different types of wheezing.

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