Original Article

Clinical Profile of Preschool wheeze in Tamil Nadu: A Hospital Based Cross sectional study

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Abstract

Background: Preschool wheeze is the wheeze occurring among children aged under the age of five years. Wheezing observed among preschool children has shown a wide heterogenicity were the long-term prognosis ranges from complete recovery to recurrent asthma. Persistent or recurrent wheeze among preschool children is observed among 60% of early wheezers. The present study was undertaken to assess the clinical profile and associated risk factors of pre-school wheezer among the given study population. **Material and Methods:** This study was a hospital based cross-sectional study conducted in Department of Pediatrics, K. A. P. V. Government Medical College & M.G.M.G.H, Trichy. The study was conducted on 50 pediatric patients aged between 3 to 5 years of age. Informed consent from the parents or primary caregivers of the infants prior to initiation of the study. Data was entered an analyzed using Statistical Package for Social Sciences (SPSS) (version 21.0) software package. **Results:** In the present study, we observed that majority were males belonging to urban areas. Fever was significantly higher among the preschool wheezers. Early exposure to cow's milk in infancy significantly increased the incidence of preschool wheeze. Rhinitis and viral upper respiratory infections were significantly more prominent among preschool wheezers. **Conclusion:** The present study concludes that preschool wheeze is a multifactorial condition predominantly influenced by infectious and allergic factors. Fever and viral upper respiratory infections were found to be significant clinical predictors, emphasizing the role of infections in triggering wheezing episodes. Early exposure to cow's milk and the presence of rhinitis were also identified as potential significant risk factors.

Keywords: Preschool wheeze, Allergen sensitization, Viral, Pediatric pulmonology, Wheezing.

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Introduction

Preschool wheeze is the wheeze occurring among children aged under the age of five years. Studies have documented that preschool wheeze is commonly observed among 1 in 3 children by the time they attain three years. Children under five have been found to wheeze more easily as compared to older children this can be attributed to smaller airways. Preschool wheeze usually manifests as a consequence of viral infections. Preschool wheeze is usually treated symptomatically by using short-acting bronchodilators (relievers) and occasionally corticosteroids. In addition to pharmacological treatment, other management includes identification of triggers, addressing environmental factors especially avoiding tobacco smoke.[1-4]

Wheezing observed among preschool children has shown a wide heterogenicity were the long-term prognosis ranges from complete recovery to recurrent asthma. Persistent or recurrent wheeze among preschool children is observed among 60% of early wheezers. The commonly observed risk factors include atopy, family history of asthma, exposure to allergens, and tobacco smoke.[5-7]

Preschool wheezing is an umbrella term for diseases with varied observations and presentations. features (phenotypes). Preschool wheezing classically presents as three phenotypes based on the clinical presentation (a) transient early wheeze, (occurs before 3 years and resolves by 6 years without lung function impairment) (b) late-onset wheeze, (occurs after 3 years and persists in childhood with atopy and decreased lung function and high bronchial hypersensitivity (c) persistent wheeze, (onset before 3 years of age and associated with atopy, high Ig E levels, allergen sensitization and decreased lung function). It is essential to understand the clinical presentation and risk factors associated with preschool wheeze to effectively manage preschool wheeze.[9-11]

The present study was undertaken to assess the clinical profile and associated risk factors of pre-school wheezer among the given study population.

Materials and Methods

This present study was a hospital based cross-sectional study

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conducted in Department of Pediatrics, K.A. P. V. Government Medical College & M.G.M.G.H, Trichy after obtaining clearance from the Institutional Ethical committee. The study was conducted on 50 pediatric patients admitted in the pediatric wards. The study included children aged between 3 years to 5 years with a positive modified Asthma Predictive Index. We excluded patients with less than 3 years and more than 5 years of age, children with LRI like TB pneumonia, heart diseases, Chest wall deformity and history of previous thoracic surgeries. A structured Proforma including the following Socio-demographic variables (age, sex), clinical history, and allergen history was used to observe and record the data after obtaining informed consent from the parents or primary caregivers of the infants. Data was entered an analyzed using Statistical Package for Social Sciences (SPSS) (version 21.0) software package. Chi square test was applied to the study variables to establish the relation between the study variables. A p value of less than 0.05 was considered to be statistically significant.

Results

During the study period, a total of 50 children aged between 3–5 years with preschool wheeze were included in the study. Among them, 29 were males and 21 were females. Majority of the children belonged to urban areas (27 cases) compared to rural areas (23 cases). We observed no statistically significant association was observed between gender, residence and the occurrence of preschool wheeze.

In the present study, we observed that dry cough was the common presenting symptom followed by no cough and wet cough. However, there was no statistical significance between the study parameters. Fever was present in 22 cases and we observed that it was significantly higher among the preschool wheezers. Other symptoms such as breathlessness, itching, chest pain, and ear discharge did not show significant association.

We observed that 43 children were born at term and 7 were preterm, with no significant association observed. Exclusive breastfeeding was noted in 10 children, while 40 children were not exclusively breastfed, we observed no statistically significant association between exclusive breast feeding and preschool wheezing. In the present study we noted that early exposure to cow's milk in infancy significantly increased the incidence of preschool wheeze.

Majority of the respondents belonged to the upper middle socioeconomic class (23 cases), followed by upper (11 cases), lower (9 cases), and upper lower class (7 cases). The assessment of nutritional status showed that 24 children were normal, while 9 were undernourished, 10 were overweight, and 7 obese. We observed no statistically significant association between socio-economic status, nutritional status and preschool wheeze in the current study.

Assessment of the environmental factors showed that exposure to furred animals, cockroach, smoke, pollen, perfumes, climate changes, and emotional factors were not significantly associated with preschool wheeze. However, rhinitis and viral upper respiratory infections were significantly more prominent among preschool wheezers. In the present study we observed that family history of asthma, atopic dermatitis, food allergy, and passive smoking showed no significant association with preschool wheeze.

Table 1: Correlation between preschool wheezer and study variables among the study participants (n=50)

Parameters	Total n (%)	Preschool wheezer		p value
		No	Yes	
Gender				
Male	29 (58)	14	15	0.196
Female	21(40)	14	7	
Residence				
Rural	23 (46)	11	12	0.283
Urban	27 (54)	17	10	
Cough				
No	14 (28)	6	8	0.174
Dry	29 (58)	16	13	
Wet	7 (14)	6	1	
Symptoms				
Fever	22 (44)	1	21	< 0.001*
Breathlessness	22 (44)	12	10	0.854
Itching	17 (34)	8	9	0.361
Chest pain	11 (22)	6	5	0.912
Ear discharge	7 (14)	2	5	0.115
Natal History				
Preterm	7 (14)	5	2	0.375
Term	43 (86)	23	20	
Exclusive breastfeeding				
No	40 (80)	21	19	0.343
Yes	10 (20)	7	3	
Cow milk in infancy				
No	28 (56)	28	0	< 0.001*
Yes	22 (44)	0	22	
Socio-economic status				
Lower	9 (18)	4	5	0.759
Upper lower	7 (14)	5	2	
Upper middle	23 (46)	13	10	

Upper	11 (22)	6	5	
Nutritional status				
Undernourished	9 (18)	3	6	0.445
Normal	24 (48)	14	10	
Overweight	10 (20)	6	4	
Obese	7 (14)	5	2	

* p value of < 0.05 was considered to be statistically significant

Table 2: Correlation between preschool wheezer and associated factors among the study participants (n=50)

Associated factors	Total n (%)	Preschool wheezer		p value
		No	Yes	
Furred animals	16 (32)	10	6	0.525
Mouse/Rat	10 (20)	4	6	0.254
Pollen	9 (18)	6	3	0.477
Cockroach	15 (30)	8	7	0.804
Emotional factors	20 (40)	10	10	0.485
Exercise	9 (18)	5	4	0.976
Climate	19 (38)	12	7	0.425
Smoke	12 (24)	7	5	0.521
Perfumes	8 (16)	5	3	0.686
Rhinitis	25 (52)	4	21	< 0.001*
Sinusitis	7 (14)	5	2	0.375
Viral URI	22 (44)	0	2	< 0.001*
Recent change of house	5 (10)	4	1	0.254
House near industry	7 (14)	4	3	0.948
Bronchiolitis in infancy	9 (18)	6	3	0.447
Seasonal rhinitis	16 (32)	10	6	0.525
Eczema	10 (20)	7	3	0.343
Maternal smoking	1 (2)	0	1	0.254
Noisy breathing	6 (12)	4	2	0.575

* p value of < 0.05 was considered to be statistically significant

Table 3: Correlation between preschool wheezer and Family history among the study participants (n=50)

Family history	Total n (%)	Preschool wheezer		p value
		No	Yes	
Asthma	24 (48)	10	14	0.05
Atopic dermatitis	11 (22)	7	11	0.56
Food allergy	6 (12)	4	2	0.57
Passive smoking	24 (48)	13	11	0.917

* p value of < 0.05 was considered to be statistically significant

Discussion

Preschool wheeze is a common clinical condition in early childhood and is influenced by multiple factors including infections, atopy, and environmental exposures. The present study was undertaken to evaluate the clinical profile and associated risk factors among children aged 3–5 years.

In the present study, majority of the children were males, which is comparable to the findings of Afraneha et al[4] and Martinez et al,[9] who reported a higher prevalence of wheezing among male children. However, no statistically significant association was observed between gender and preschool wheeze, indicating that both genders are equally susceptible.

In the present study majority of the children resided in urban areas, similar to observations by Visser et al,[3] which may be attributed to increased exposure to environmental pollutants and allergens. However, the association was not statistically significant though numerical variations were present in the present study.

Dry cough was the most common presenting symptom, which is consistent with previous studies. Fever showed a statistically significant association with preschool wheeze in this study, highlighting the role of infections. Similar findings were reported by Bush et al,[1] and Jurca et al,[7] who emphasized that viral infections are the most common triggers of wheezing in preschool children. The significant association of viral upper respiratory infections in the present study further supports the role of viral infections on episodic viral wheeze as described in earlier published literature.

In the present study, we observed that early exposure to cow's milk was significantly associated with preschool wheeze. This finding may be explained by early allergen sensitization and immune modulation. Similar associations between early feeding practices and wheezing disorders have been reported in previous studies.

Rhinitis showed a significant association with preschool wheeze, which is in concurrence with Henderson et al,[2] and Collins et al,[10] who demonstrated that allergic rhinitis is strongly associated with persistent wheezing and future asthma.

Environmental factors such as exposure to pets, smoke, pollen, and climatic variations did not show significant association in this study. This is in contrast to some studies but may be due to exposure levels or difficulty in the quantification of environmental risk factors.

Family history of asthma showed borderline statistical significance, which is comparable with findings by Martinez et al,[9] suggesting a genetic predisposition to wheezing disorders. However, other atopic conditions such as eczema and food allergy did not show significant association in the present study.[11]

No significant association was observed between nutritional status and socioeconomic status with preschool wheeze, indicating that infectious and allergic factors play a more prominent role in this age group.

Overall, the present study highlights that infections, allergic conditions, and early feeding practices are important determinants of preschool wheeze.

Conclusion

The present study concludes that preschool wheeze is a multifactorial condition predominantly influenced by infectious and allergic factors. Fever and viral upper respiratory infections were found to be significant clinical predictors, emphasizing the role of infections in triggering wheezing episodes. Early exposure to cow's milk and the presence of rhinitis were also identified as potential significant risk factors.

Sociodemographic factors, nutritional status, and most environmental exposures did not show significant association with preschool wheeze in this study. Family history of asthma showed a borderline association, indicating a possible genetic predisposition.

Early identification of modifiable risk factors such as inappropriate feeding practices and management of allergic conditions may help in reducing the burden of preschool wheeze and preventing progression to chronic respiratory diseases like asthma.

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Conflicts of interest

There are no conflicts of interest.

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