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To cite this article: Giorgio Ciprandi, Luigi Cioffi, Irene Schiavetti, Michele Miraglia del Giudice & Maria Angela Tosca (2022): Factors associated with wheezing recurrence in clinical practice, Journal of Asthma, DOI: [10.1080/02770903.2022.2087187](https://doi.org/10.1080/02770903.2022.2087187)

To link to this article: <https://doi.org/10.1080/02770903.2022.2087187>



Published online: 10 Jun 2022.



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Factors associated with wheezing recurrence in clinical practice

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To the Editor,

Wheezing is a daily challenge in clinical practice and the workup is demanding (1). Moreover, wheezing in preschoolers is very common as about half of children present at least one wheezing episode in the first 6 years of life (2). Acute respiratory infections usually precede wheezing (3). Allergy may also promote airway inflammation and arrange for infection susceptibility (4). In addition, other factors may be involved in wheezing recurrence, including passive smoking, pollution, overcrowding, and kindergarten attendance (5).

A recent study investigated different wheezing phenotypes in a pediatric Turkish cohort (6). The study identified five wheeze phenotypes, including transient early wheeze (34.9%), non-atopic wheeze (18%), atopic wheeze (22.3%), intermediate onset wheeze (11.1%), and late onset wheeze (11.7%). Recurrent wheezing episodes (more than three/year) was an inclusion criterion. Hospitalization was more prevalent in children with transient early wheeze or non-atopic wheeze than in other groups.

As a result, we would propose our experience conducted on a sample of children with recurrent wheezing (at least three episodes in the past) and followed at the level of primary care pediatrics. In addition, we aimed to investigate possible factors associated with wheezing in a reasonably narrow time frame, i.e. 4 months during the winter season.

Independent samples t-test or non-parametric Mann-Whitney test was performed to compare continuous variables between groups (no wheezing episode vs. at least one episode). In addition, the Chi-square test or Fisher's exact test evaluated the association between categorical variables.

Table 1 reassumes the results obtained. Seventy-one children with recurrent wheezing, the mean age was 4.4 years, and males were prevalent (56.3%), residence

in an urban center was more common (69%), about one third were exposed to secondhand smoke, and three quarters attended kindergarten. There was family atopy in two-thirds, but only 11 (15.5%) were allergic: 7 to mites and 5 to pollens. In addition, 13 children took only short-acting beta-agonists (SABA) on-demand, 14 low-dose inhaled corticosteroids (ICS), and 11 medium-dose ICS. Eighteen children (25%) presented at least one wheezing episode during the observation period. Analyzing the possible factors associated with wheezing recurrence, only the number of episodes in the past was significant in the univariate analysis. Namely, children with wheezing recurrence had a more prevalent number of wheezing episodes in their history than children without recurrence (7.4 vs. 4.9; $p=0.003$). The multivariate analysis was not performed since only one factor was identified in the univariate analysis.

Consequently, the current case study differed from that reported by Marques-Mejias and colleagues, mainly concerning the sensitization pattern. It could depend on geographical and environmental factors. However, the primary outcome underscored the relevance of the number of previous wheezing episodes as a primary factor associated with wheezing recurrence. This finding was consistent with previous studies that highlighted the importance of prior asthma exacerbation as the leading risk factor for further exacerbations (7,8).

The present report had some limitations, including the short observation period, the lack of biomarkers assessment, and the documentation of infections origin. However, the clinical relevance resides in the fact that it has been conducted in a real-life pediatric primary care setting.

In conclusion, it is clinically relevant to underscore the importance of an adequate and thorough workup in managing children with recurrent wheezing. In

Table 1. Factors associated with the occurrence of wheezing episodes during the observation.

Subjects		TOTAL (N = 71)	No episode (N = 53)	At least one episode (N = 18)	Univariate
Age (years)		4.4 ± 0.78 4.0 (1.0–5.0)	4.4 ± 0.84 5.0 (1.0–5.0)	4.3 ± 0.57 4.0 (3.0–5.0)	0.22
Sex	Female	31 (43.7%)	25 (47.2%)	6 (33.3%)	0.31
	Male	40 (56.3%)	28 (52.8%)	12 (66.7%)	
Living	City	49 (69.0%)	35 (66.0%)	14 (77.8%)	0.35
	Countryside	22 (31.0%)	18 (34.0%)	4 (22.2%)	
Passive smoking	None	45 (63.4%)	36 (67.9%)	9 (50.0%)	0.17 (no vs yes)
	Father	14 (19.7%)	10 (18.9%)	4 (22.2%)	
	Mother	6 (8.5%)	4 (7.5%)	2 (11.1%)	
	Both	4 (5.6%)	3 (5.7%)	1 (5.6%)	
	Other	2 (2.8%)	0 (0.0%)	2 (11.1%)	
School attendance	No	18 (25.4%)	12 (22.6%)	6 (33.3%)	0.37
	Yes	53 (74.6%)	41 (77.4%)	12 (66.7%)	
Familial atopy	No	24 (33.8%)	16 (30.2%)	8 (44.4%)	0.27
	Yes	47 (66.2%)	37 (69.8%)	10 (55.6%)	
Number of wheezing episodes in the past		5.5 ± 3.36 5.0 (0.0–6.0)	4.9 ± 3.25 4.0 (0.0–16.0)	7.4 ± 3.03 7.0 (3.0–14.0)	0.003
Allergy	Allergy	11 (15.5%)	7 (13.2%)	4 (22.2%)	0.36
	Mono-allergy	5 (7.0%)	3 (5.7%)	2 (11.1%)	
	Poly-allergy	6 (8.5%)	4 (7.5%)	2 (11.1%)	
	Mite allergy	7 (9.9%)	5 (9.4%)	2 (11.1%)	
Baseline O ₂ saturation	Pollen allergy	5 (7.0%)	3 (5.7%)	2 (11.1%)	0.84
					0.44
Treatments		97.5 ± 1.75	97.6 ± 1.68	97.3 ± 1.96	0.63
	No therapy	33 (46.5%)	25 (47.2%)	8 (44.4%)	0.68
	SABA	13 (18.3%)	11 (20.8%)	2 (11.1%)	
	Low-dose ICS	14 (19.7%)	9 (17.0%)	5 (27.8%)	
	Medium-dose ICS	11 (15.5%)	8 (15.1%)	3 (16.7%)	

addition, this observation underlined the relevance of the number of previous wheezing episodes. It is important to adopt preventive measures, such as vaccinations, anti-inflammatory agents, allergen-specific immunotherapy, if indicated, and potentially, as recently reported, immunomodulators (9).

Acknowledgements

We would thank the PROPAM Study Group Members (Francesco Paolo Brunese, Francesco Carlomagno, Donatella Del Gaizo, Antonietta D'Onofrio, Patrizia Gallo, Maria Giuliano, Salvatore Iasevoli, Raffaele Limauro, Roberto Sassi, Giannamaria Vallefucio) who collected the clinical cases.

Funding

The author(s) reported there is no funding associated with the work featured in this article.

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References

1. Tenero L, Tezza G, Cattazzo E, Piacentini G. Wheezing in preschool children. *Early Hum Develop.* 2013;89:S13–S17. doi:10.1016/j.earlhumdev.2013.07.017.
2. Ducharme FM, Tse SM, Chauhan B. Diagnosis, management, and prognosis of preschool wheeze. *Lancet.* 2014;383(9928):1593–1604. doi:10.1016/S0140-6736(14)60615-2.
3. Wark PAB, Ramsahai JM, Pathinayake P, Malik B, Bartlett NW. Respiratory viruses and asthma. *Semin Respir Crit Care Med.* 2018;39(1):45–55. doi:10.1055/s-0037-1617412.
4. Edwards MR, Strong K, Cameron A, Walton RP, Jackson DJ, Johnston SL. Viral infections in allergy and immunology: How allergic inflammation influences viral infections and illness. *J Allergy Clin Immunol.* 2017;140(4):909–920. doi:10.1016/j.jaci.2017.07.025.
5. Padem N, Glick Robison R. The infant and toddler with wheezing. *Allergy Asthma Proc.* 2019;40(6):393–395. doi:10.2500/aap.2019.40.4255.
6. Ulusoy EU, Bal CM, Gulen F, Tanac R, Demir E. Identifying wheezing phenotypes in a pediatric Turkish cohort. *J Asthma* (in press).
7. Arrotta N, Hill J, Villa-Roel C, Dennett E, Harries M, Rowe BH. Factors associated with hospital admission in adult patients with asthma exacerbations: A systematic review. *J Asthma.* 2019;56(1):34–41. doi:10.1080/02770903.2018.1424189.
8. Fleming L. Asthma exacerbation prediction: recent insights. *Curr Opin Allergy Clin Immunol.* 2018;18(2):117–123. doi:10.1097/ACI.0000000000000428.
9. Drago L, Cioffi L, Giuliano M, Pane M, Amoroso A, Schiavetti I, et al. The PRObiotics in Pediatric Asthma Management (PROPAM) study in the primary care setting: a randomized, controlled, double-blind trial with *Ligilactobacillus salivarius* LS01 (DSM 22775) and *Bifidobacterium Breve* B632 (DSM 24706). *J Immunol Res.* 2022;2022:3837418. doi:10.1155/2022/3837418.