

CORRESPONDENCE

Rhinitis and lung function in asthmatic children

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This article "Airway dysfunction in nasal polyposis: a spectrum of asthmatic disease?" (*Clinical & Experimental Allergy*, 41: 1379–1385) is very interesting as the authors realized that Chronic rhinosinusitis with nasal polyposis (CRSwNP) may represent an interesting model to investigate the possible existence of a non-allergic unified airway [1]. Williamson and colleagues reported that in CRSwNP there is asymptomatic airway dysfunction suggestive of an asthmatic phenotype. In addition, they noted that impairment of lung function was significantly associated with bronchial hyperreactivity (BHR) to methacholine challenge and eosinophilia, but not parameters of nasal disease suggesting that severity of airway dysfunction related to the spectrum of asthma rather than rhinosinusitis. Therefore, they concluded that lower airways dysfunction is common in CRSwNP, but does not correlate to the nasal disease severity. This original study underlined also that signs and symptoms of asthma should be sought and treated in CRSwNP patients.

In particular about those results, a multivariate regression analysis in cohort showed that after taking gender, age, rhinitis duration and polyp grade into account, BHR was the only independent predictor for both forced expiratory volume in 1 s (FEV₁) and forced expiratory flow at 25–75% of vital capacity (FEF_{25–75}). The authors considered that this finding provided a strong argument that lower airway dysfunction in patients with CRSwNP was most strongly associated with a traditional asthma phenotype and would be against a functional link between severity of rhinitis and lower airway dysfunction *per se*. The authors said further that their findings contrasted to the study in allergic rhinitis (AR) by Ciprandi et al. [2], which suggested a strong association between duration of nasal disease and spirometry. In this regard, we would like to consider some comments:

- 1 AR and CRSwNP are surely two very different diseases, characterized by pathogenic mechanisms particularly peculiar. In particular, nasal obstruction symptom is mainly sustained by turbinates hypertrophy in AR, whereas by polyp formation in CRSwNP. This aspect might be relevant as the hypertrophy of turbinates is a progressive phenomenon that could be significantly affected by AR duration.
- 2 AR duration should be not interpreted by default as a surrogate of AR severity.
- 3 The impact of AR duration on lung function in AR patients has been evidenced by several studies, conducted both in adults and in children, mainly concerning the effects on FEV₁ [2, 3], BHR [4, 5] and reversibility to bronchodilation [6, 7].
- 4 As possible explanation of these results, two studies reported that AR duration significantly reduced the nasal airflow [8] and the response to nasal decongestion testing [9], and there was a relationship between responses to nasal decongestion testing and to bronchodilation testing [3]. These findings could depend on nasal remodelling: in fact, a fibrotic tissue should be less responsive to adrenergic stimulation. [10].

On the other hand, the influence of AR on asthma remains a debated topic. Therefore, we aimed to investigate whether AR *per se* could affect lung function in asthmatic children. This retrospective study included

Table 1. Demographic and clinical characteristics of children with mild asthma associated or not to rhinitis

	Patients with asthma (N = 250)	Patients with asthma and rhinitis (N = 250)	P-value
Male gender [N (%)]	142 (56.8)	156 (60)	0.2
Age at referral (years)	13	12	0.6
Asthma duration (years)	6 [3–7]	6 [2–8]	0.8
FVC (% predicted)	91 [87–94]	89 [86–93]	0.07
FEV ₁ (% predicted)	82 [77–85]	80 [77–85]	0.09
FEF _{25–75} (% predicted)	66 [60–73]	65.5 [60–72]	0.1
Frequency of FEF _{25–75} ≤ 65% [N (%)]	108 (43.2)	102 (40.8)	0.560

All quantitative variables are expressed as median [IQR].

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500 children (298 males): 250 with asthma and 250 with asthma associated to rhinitis. Patients were evaluated during summer, such as season typically characterized by low-no nasal symptom occurrence in the Mediterranean Area. The inclusion criteria were: a documented diagnosis of asthma and AR, absence of nasal symptoms, no use of pharmacological treatment and FEV₁ values $\leq 85\%$ of predicted. Demographic and spirometric characteristics, are reported in Table 1. Patients with asthma alone presented a median forced vital capacity (FVC) value of 91%, a median FEV₁ value of 82% and a median FEF_{25–75%} value of 66%. Patients with asthma and AR had a median FVC value of 89%, a median

FEV₁ value of 80% and a median FEF_{25–75%} value of 65.5%. In addition, 108 children (43.2%) with asthma alone and 102 (40.8%) children with asthma and AR had FEF_{25–75%} values $\leq 65\%$ of predicted. There was no statistical difference among considered parameters. This study demonstrated that asymptomatic AR seems to do not affect lung function in children with mild asthma.

In conclusion, the hypothesis that AR *per se* could not directly affect lung function cannot be completely excluded. Probably, the presence and overall the severity of nasal symptoms may actually influence the lung function, but further studies should be conducted to confirm this although.

References

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