

Mapping paediatric aeroallergen sensitization profiles and optimizing skin prick test panels in Southern Belgium

Stavart C^{1,2}, Thimmesch M³, Cousin J⁴, De Saint Moulin T⁵, Gueulette E⁶, Blavier N⁷, Goubau C⁸, Bodart E¹

¹ Department of Paediatrics, CHU UCL Namur Godinne, Belgium.

² Pole of Pneumology, ENT and Dermatology (LUNS), Institute of Experimental and Clinical Research (IREC), UCLouvain, Belgium.

³ Division of Paediatric Pulmonology, Department of Paediatrics, CHC MontLégia, Liège, Belgium.

⁴ Department of Paediatrics, Grand-Hôpital de Charleroi, Charleroi, Belgium.

⁵ Department of Paediatrics, Clinique Saint-Pierre Ottignies, Ottignies, Belgium.

⁶ Department of Paediatrics, CHU UCL Namur Saint-Elisabeth, Namur, Belgium.

⁷ Department of Paediatrics, Clinique Notre-Dame de Grâce, Gosselies, Belgium.

⁸ Division of Paediatric Pulmonology, Department of Paediatrics, Cliniques universitaires Saint-Luc, Brussels, Belgium.

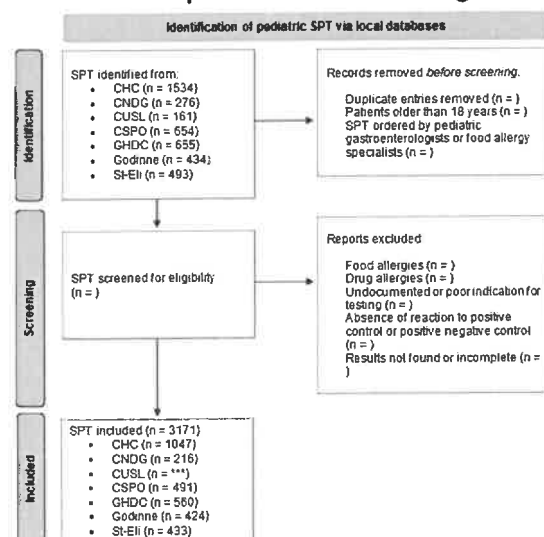
Background

In recent years, the prevalence of paediatric allergic diseases, particularly respiratory allergies, has risen significantly worldwide, with notable regional variations. These conditions not only persistently affect the quality of life of children but also impose a heavy economic burden. Accurate identification of causal allergens is crucial for effective allergen avoidance, predicting disease severity, and enabling personalized treatment through specific immunotherapy.

Factors such as urbanization, lifestyle changes, climate variations, and age contribute to significant disparities in allergen prevalence and distribution across different regions. Given the evolution of allergen sensitization patterns, local allergen screening panels must be regularly updated. However, in Belgium, research on allergen sensitization patterns has been limited, and no comprehensive multicenter study has been performed recently.

Methods

This multicenter epidemiological study analyzed data from paediatric patients who underwent skin prick tests (SPT) for suspected aeroallergen-related allergic reactions. Data were collected from seven participating hospitals in Southern Belgium: Montlegia, Mont-Godinne, Saint-Elisabeth, CNDG, CSPO, CUSL, and GHDC. Clinical information, including age, sex, indication, and test results, was collected from patients seen over a one-year period (January 1st to December 31st, 2023). The final sample included 3297 patients after excluding those who met exclusion criteria.



Results

The overall positivity rate of SPT was 46.2%, with a significant increase in prevalence with age. Prevalence of positive SPT varied between centers, ranging from 30.1% to 65.9%. Differences were also noted in the choice of age cut-off and discrepancies in the selection of allergen panels.

Globally, our findings reveal a high positivity rate for dust mites, followed by grass and birch pollen allergens, and then animal dander with over 65% of sensitized patients exhibiting polysensitization. This frequency of polysensitization also increased with age.

Patients	CHC	Godinne	St-Eli	CNDG	CUSL	CSPO	GHDC	TOTAL
Frequency (n)	1047	424	433	216	***	491	560	3171
Percentage (%)								100.0%
Gender								
• Boys (n, %)	625 (59.7)	262 (61.8)	249 (57.5)	120 (55.6)		288 (58.7)	339 (60.5)	
• Girls (n)	422	160	184	96		202	221	
Age groups (years, %)								
• 0 – 5	553 (52.8)	182 (42.9)	212 (49.0)	142 (65.7)		226 (46.0)	324 (57.9)	
- 0 – 1	116 (11.1)	39 (9.2)	64 (14.8)	46 (21.3)		66 (13.4)	78 (13.9)	
- 2 – 3	189 (18.1)	74 (17.5)	74 (17.1)	56 (25.9)		73 (14.9)	117 (20.9)	
- 4 – 5	248 (23.7)	69 (16.3)	74 (17.1)	40 (18.5)		87 (17.7)	131 (23.4)	
• 6 – 11	388 (37.1)	165 (38.9)	157 (36.3)	61 (28.2)		196 (39.9)	175 (31.3)	
• 12 – 18	106 (10.1)	77 (18.2)	64 (14.8)	13 (6.0)		69 (14.1)	61 (10.9)	
Disease phenotypes (n, %)								
• Allergic rhinitis/ rhinoconjunctivitis	449 (42.9)	110 (25.9)	163 (37.6)	47 (21.8)		211 (43.0)	173 (30.9)	
• Respiratory manifestation	769 (73.4)	333 (78.5)	282 (65.1)	156 (72.2)		289 (58.9)	375 (67.0)	
• Dermatological manifestation	22 (2.1)	24 (5.7)	21 (4.6)	18 (8.3)		36 (7.3)	33 (5.9)	

Table 1. Demographic characteristics of the study population

Patients	CHC	Godinne	St-Eli	CNDG	CUSL	CSPO	GHDC	TOTAL
Sensitization distribution by disease phenotypes (n, %)								
• Allergic rhinitis/ rhinoconjunctivitis	283/449 (63.0)	68/110 (61.8)	105/163 (64.4)	16/47 (34.0)		114/211 (54.0)	91/177 (52.6%)	
• Respiratory manifestation	343/769 (44.6)	167/333 (50.2)	142/282 (50.4)	50/156 (32.1)		100/289 (34.6)	135/375 (36.0%)	
• Dermatological manifestation	9/22 (40.9)	12/24 (50.0)	7/21 (33.3)	2/18 (11.1%)		5/36 (13.9)	14/33 (42.4%)	
Prevalence of positive SPT (n, %)	503 (48.0)	226 (53.3)	226 (52.1)	65 (30.1)		191 (38.9)	223 (39.8)	

Conclusion

This study highlights the need for a harmonized approach to allergy management, with regular updates to local allergen screening panels to reflect evolving sensitization patterns and regional conditions.