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Research paper

Mapping paediatric aeroallergen sensitisation profiles and optimising skin prick test panels in Southern Belgium

Corentin Stavart [a,b,c,*], Matthieu Thimmesch [d], Thierry De Saint-Moulin [e], Jerry Cousin [f], Emmanuelle Gueulette [g], Nathalie Blavier [h], Christophe Goubau [c], Eddy Bodart [a]

[a] Department of Paediatrics, CHU UCL Namur Godinne, Yvoir, Belgium
[b] Pole of Lung, Nose and Skin (LUNS), Institute of Experimental and Clinical Research (IREC), Université catholique de Louvain (UCLouvain), Brussels, Belgium
[c] Department of Paediatrics, Cliniques universitaires Saint-Luc, Brussels, Belgium
[d] Division of Paediatric Pulmonology, Department of Paediatrics, CHC MontLégia, Liège, Belgium
[e] Department of Paediatrics, Clinique Saint-Pierre Ottignies, Ottignies, Belgium
[f] Department of Paediatrics, Grand-Hôpital de Charleroi, Charleroi, Belgium
[g] Department of Paediatrics, CHU UCL Namur Saint-Elisabeth, Namur, Belgium
[h] Department of Paediatrics, Clinique Notre-Dame de Grâce, Gosselies, Belgium

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ABSTRACT

Background: Allergic diseases are rapidly increasing worldwide, with considerable regional variations. In Belgium, studies on paediatric aeroallergen sensitisation have been lacking.
Methods: This multicentre, epidemiological study analysed aeroallergen sensitisation patterns in children across seven hospitals in Southern Belgium, using retrospective skin prick tests data from 2023. Its secondary objective was to identify the most relevant aeroallergens and define a region-specific minimal panel optimising diagnostic efficiency.
Results: A total of 3297 patients were included, with respiratory symptoms being the primary indication for testing. The overall skin prick test positivity rate was 46.2 %, with significant age-related variations, including a notably lower rate in children under 3 years (16.6 %). The most common allergens identified were house dust mites (63.9 %), grass pollen (43.5 %), Betulaceae pollen (35.9 %), and cat dander (31.1 %). Over 63 % of sensitised children exhibited polysensitisation, with its prevalence increasing with age. Two distinct five-allergen panels, one for children under 3 years and one for older children, capture over 95 % of sensitisation.
Conclusion: This study provides a real-life overview of aeroallergen sensitisation based on a large cohort of Belgian children. Two minimal five-allergen panels offer a cost-effective and region-specific diagnostic tool. Findings also highlight the limited positivity of skin prick tests in children under 3 years, underscoring the importance of adequate test performance and interpretation in this age group to ensure reliable results.

1. Introduction

Over the past decade, the prevalence of (paediatric) allergic diseases, particularly respiratory allergies, has risen significantly worldwide, with notable regional variations [1]. These conditions not only persistently affect the quality of life for children but also impose a heavy economic burden [2]. Paediatricians and allergologists aim to identify the optimal management strategy for each child by accurately identifying causal allergens, which enables effective allergen avoidance, prediction of disease severity, and personalised treatment with specific immunotherapy.

Factors such as indoor and outdoor environments, level of urbanisation, lifestyle changes, climate variations, global warming, age, and gender contribute to significant geographical variations in the prevalence and types of aeroallergens [3]. Furthermore, the observation that allergen sensitisation patterns evolve over time highlights the necessity of regularly updating local allergen screening panels to ensure they accurately reflect current conditions [1,4].

Many studies have shown that the spectrum of aeroallergens differs significantly not only between countries but also within a country [5–7].

* Corresponding author at: IREC-LUNS, Université catholique de Louvain (UCLouvain), Avenue Hippocrate, 54 bte B1.54.04 1200 Woluwé-Saint-Lambert, Belgium.
E-mail address: corentin.stavart@uclouvain.be (C. Stavart).

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In Belgium, research on allergen sensitisation patterns has been limited, with the last major study conducted in 2009 [8], and no comprehensive nationwide multicentre study on common aeroallergens has been performed.

Skin Prick Tests (SPT) are a cornerstone in paediatric immunoglobulin (Ig) E-mediated allergy diagnosis, valued for their simplicity, cost-effectiveness, and rapid, low-risk results. With excellent sensitivity (80–97 %) and strong specificity (70–95 %), SPT effectively identify relevant allergens when correlated with clinical and environmental factors [9]. Their capacity to test multiple allergens simultaneously and their minimally invasive nature make them a preferred tool for personalised allergy management in children.

Consequently, extensive multicentre epidemiological surveys targeting children with allergic symptoms are imperative. This study provides an updated, real-life overview of aeroallergen sensitisation patterns in a large cohort of children from Southern Belgium. Its secondary objective is to identify the most relevant aeroallergens and propose a region-specific minimal panel that minimises unnecessary testing while ensuring accurate aeroallergen selection.

2. Methods

2.1. Study setting and population

This multicentre, epidemiological study analysed data from paediatric patients who underwent SPT for suspected aeroallergen-related allergic reactions. Using a retrospective chart review, data were collected from patients seen over a one-year period from January 1st to December 31st, 2023, at seven participating hospitals in Southern Belgium, including two tertiary centres, CHU UCL Namur Godinne and Cliniques universitaires Saint-Luc, and five secondary centres, CHC Montlégia, CHU UCL Namur Saint-Elisabeth, Clinique Notre-Dame de Grâce de Gosselies, Clinique Saint-Pierre d'Ottignies and Grand Hôpital de Charleroi, all within paediatric respiratory and allergology units.

The study was conducted in accordance with the Declaration of Helsinki and was approved separately by the institutional ethics committee (IEC) of the coordinating centre (CHU UCL NamurGodinne) as well as by the IEC of each participating hospital. Informed consent was waived by IEC due to the observational, retrospective and anonymised design of the study.

All patients were evaluated in a specialised consultation for atopic clinical manifestations, including respiratory complaints suggestive of allergic asthma, rhinoconjunctival complaints suggestive of allergic rhinitis, and/or dermatological complaints suggestive of atopic dermatitis. Clinical information for each child, including age, sex, and indications for testing, along with their test results, was collected. Exclusion criteria were negative skin reactions to histamine or positive reactions to saline, ongoing use or inadequate wash-out of drugs interfering with SPT, and indications related to food allergies, drug allergies, insect venom allergies, cystic fibrosis, bronchiectasis, familial screening, or cases with undocumented indications. Additionally, records removed before screening included duplicate entries, patients older than 18 years, and SPT ordered by paediatric gastroenterologists. All test indications, as well as their interpretation, were reviewed by a single investigator to ensure consistency. Patients were stratified according to their clinical phenotype and grouped into three widely used paediatric age groups (0–5, preschool; 6–11, primary school; 12–18 years, adolescent) to allow a detailed analysis of the distribution.

2.2. Skin prick test procedure

All participants underwent SPT following international guidelines set forth by the European Academy of Allergy and Clinical Immunology [9] and as described by Bousquet et al. [10]. SPT procedures were seamlessly integrated into routine clinic protocols, ensuring adherence to these established standards. Consistency in testing procedures was maintained across centres, encompassing guidelines for distance placement between tests, prevention of induced bleeding, use of separate needles for each test, standardised readings taken 15–20 min post-application, and following the appropriate discontinuation of pharmacotherapy before testing. SPT were considered positive if the mean wheal diameter was 3 mm larger than the negative control. Patients were considered polysensitised if they were sensitised to two or more allergens.

SPT utilised standardised aeroallergen extracts with histamine 10 mg/mL and 0.9 % saline serving as positive and negative controls, respectively. Tested aeroallergens included tree pollens (birch, oak, ash, beech, hazel, alder, Betulaceae mix [birch, hazel, alder]), grass pollens (timothy grass, five grass mix [cocksfoot, sweet vernal-grass, rye grass, meadow grass, and timothy grass]), weed pollens (mugwort, plantain), moulds (*Alternaria alternata, Aspergillus fumigatus, Cladosporium herbatum*), house dust mites (*Dermatophagoides (D.) pteronissynus, D. farinae*), and animal dander (cat, dog, horse, rabbit). Each centre had the flexibility to tailor their test panels based on individual practitioner preferences and clinical indications, ensuring the relevance of chosen allergen extracts to the local setting and allowing for adjustments as needed to accommodate variations in patient demographics or symptomatology.

2.3. Statistical analysis

GraphPad Prism software (version 5, GraphPad Inc.) was used for statistical analyses. All data reported are descriptive and represented as numbers with percentages unless otherwise stated. Allergens tested in less than 5 % of the population (horse, rabbit, oak, beech) were excluded from the analysis. The results for the four tree pollens (birch, hazel, alder, and Betulaceae mix [birch, hazel, alder]) were recorded individually but also pooled and referred to hereafter as *Betulaceae* to maximise interpretability, reflecting their common combination in immunotherapy, substantial cross-reactivity, and differences across centres in using the mix versus individual pollens. A nonlinear sigmoidal four-parameter regression (Hill equation) was used to estimate the inflection point (EC_{50}) with a 95 % confidence interval (CI), corresponding to the age at which half of the maximal positivity rate is reached.

A step-by-step conditional approach, as described by Bousquet [11], was used to select allergens based on their prevalence of sensitisation, starting with the most prevalent allergen and sequentially identifying the next allergen by excluding sensitised subjects from the previous selection. The combination of allergens that identified at least 95 % of all sensitised subjects was defined as the optimal panel.

3. Results

A total of 3297 of the 4209 patients (1955 boys and 1342 girls, median age 5.85 years, IQR 3.45–9.46) were finally included in this epidemiological study, since 744 subjects met exclusion criteria and had to be omitted from the study, and an additional 168 were excluded prior to screening (Fig. 1). Demographic characteristics of the study population are shown in Table 1. Although all paediatric age groups were represented, children aged 4 to 5 years accounted for the largest proportion of participants. Respiratory symptoms (69.8 %) represented the primary indication for allergy testing, followed by rhinitis or rhinoconjunctivitis (36.5 %) and dermatological manifestations (4.7 %). Indication profiles varied across centres, although dermatological complaints consistently accounted for the smallest proportion of cases (1.6–8.3 %).

The overall SPT positivity rate was 46.2 %, with a significant increase in prevalence with age (Fig. 2). A notably low positivity rate was observed in children under 3 years of age (16.6 %). According to the regression model, the probability of a positive test increases markedly around 4 ($LogEC_{50}$ 4.0, 95 % CI 3.4–4.7). The prevalence of positive SPT varied between centres, ranging from 30.1 % to 65.9 %. Overall, sensitisation was most frequently observed to house dust mites (HDM)

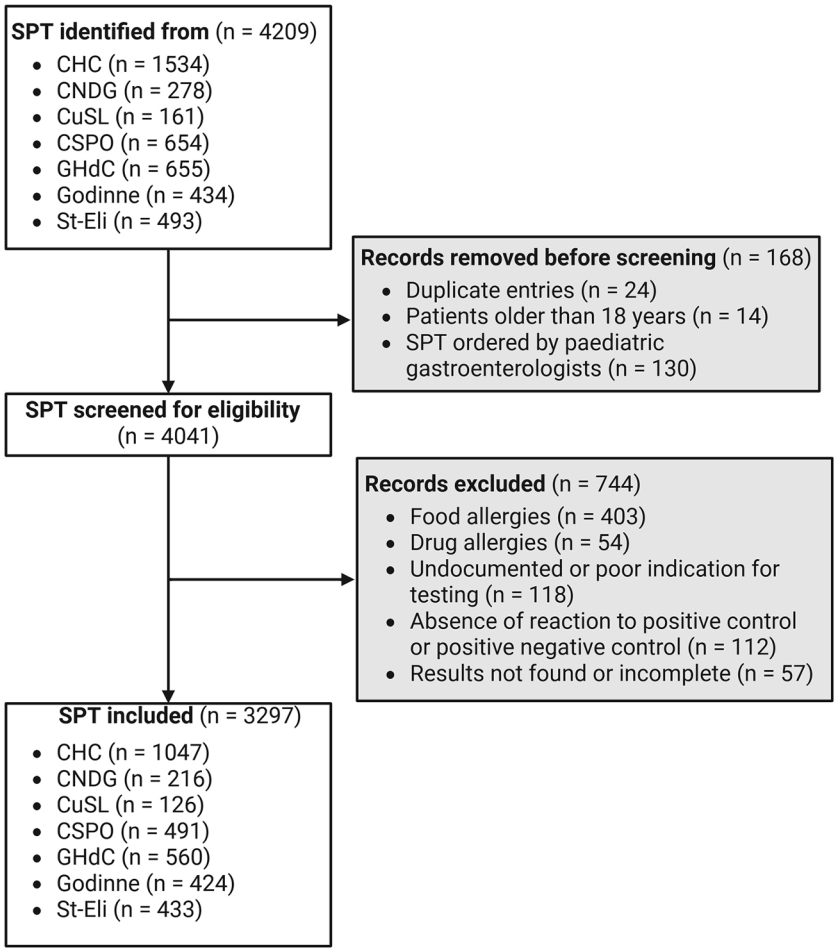

Fig. 1. Flow chart of the multicentre study population.
SPT: Skin Prick Tests; Godinne: CHU UCL Namur, Mont-Godinne; CuSL: Cliniques universitaires Saint-Luc; CHC: Centre Hospitalier Chrétien MontLégia; St-Eli: CHU UCL Namur, Saint-Elisabeth; CNDG: Clinique Notre-Dame de Grâce de Gosselies; CSPO: Clinique Saint-Pierre d'Ottignies; GHdC: Grand Hôpital de Charleroi

Table 1
Demographics and sensitisation rates of the total study population and by centre.

Patients	Centre 1	Centre 2	Centre 3	Centre 4	Centre 5	Centre 6	Centre 7	TOTAL
Hospital type	Secondary	Tertiary	Secondary	Secondary	Tertiary	Secondary	Secondary	
Patients (n, %)	1047 (31.8)	424 (12.9)	433 (13.1)	216 (6.6)	126 (3.8)	491 (14.9)	560 (17.0)	3297 (100.0)
Gender								
Boys	625	262	249	120	71	289	339	1955
(n, %)	(59.7)	(61.8)	(57.5)	(55.6)	(56.3)	(58.9)	(60.5)	(59.3)
Girls (n)	422	162	184	96	55	202	221	1342
Age groups (years, %)								
0 – 5	553 (52.8)	182 (42.9)	215 (49.0)	142 (65.7)	46 (36.5)	226 (46.0)	324 (57.9)	1688 (51.2)
0 – 1	116 (11.1)	39 (9.2)	68 (15.7)	46 (21.3)	8 (6.3)	66 (13.4)	78 (13.9)	421 (12.8)
2 – 3	189 (18.1)	74 (17.5)	74 (17.1)	56 (25.9)	8 (6.3)	73 (14.9)	116 (20.7)	590 (17.9)
4 – 5	248 (23.7)	69 (16.3)	73 (16.9)	40 (18.5)	30 (23.8)	87 (17.7)	130 (23.2)	677 (20.5)
6 – 11	388 (37.1)	165 (38.9)	157 (36.3)	61 (28.2)	58 (46.0)	196 (39.9)	175 (31.3)	1200 (36.4)
12 – 18	106 (10.1)	77 (18.2)	61 (14.1)	13 (6.0)	22 (17.5)	69 (14.1)	61 (10.9)	409 (12.4)
Sensitisation distribution by disease phenotypes (n, %)								
Rhinitis/ rhinoconjonctivitis	283/449	68/110	105/163	16/47	37/48	116/211	93/177	718/1205
	(63.0)	(61.8)	(64.4)	(34.0)	(77.1)	(55.0)	(52.6)	(59.6)
Respiratory manifestation	343/769	167/333	142/282	50/156	64/97	104/289	135/375	1005/2301
	(44.6)	(50.2)	(50.4)	(32.1)	(66.0)	(36.0)	(36.0)	(43.7)
Dermatological manifestation	9/22	12/24	7/21	2/18	2/2	5/36	14/33	51/156
	(40.9)	(50.0)	(33.3)	(11.1)	(100.0)	(13.9)	(42.4)	(32.7)
Prevalence of positive SPT (n, %)	503	226	226	65	83	196	223	1522
	(48.0)	(53.3)	(52.1)	(30.1)	(65.9)	(39.9)	(39.8)	(46.2)

SPT: Skin Prick Tests.

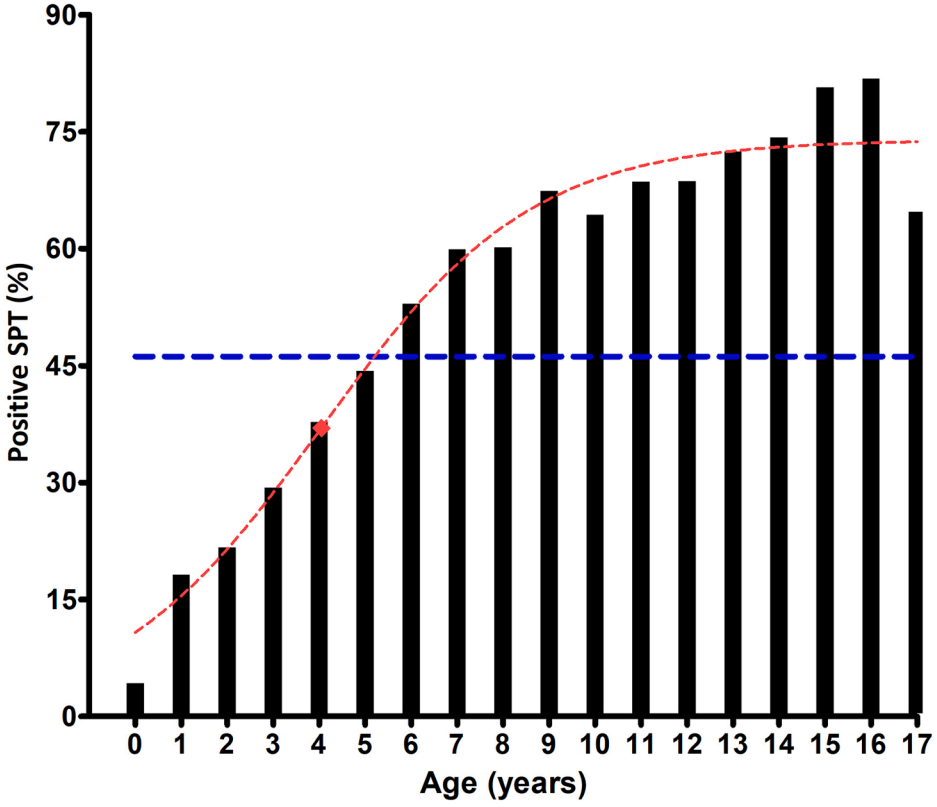

Fig. 2. Skin Prick Tests (SPT) positivity according to age and total (46.2 %).
The horizontal blue dashed line represents the overall mean sensitisation. The red dashed curve shows the regression curve, with the inflection point (EC_{50}) indicated as a red bullet point.

(63.9 %), followed by grass pollen (43.5 %), Betulaceae pollen (35.9 %), and cat dander (31.1 %) (Fig. 3). A similar frequency order, as well as a comparable distribution of allergens, was observed across the different clinical phenotypes (Table 2).

More than 63 % of sensitised children exhibited polysensitisation, with its frequency increasing with age (Fig. 4). A substantial proportion of those sensitised to HDM were monosensitised (32.2 %), whereas this proportion was lower for grass (11.7 %) and Betulaceae pollen (10.8 %) and even lower for other allergens (Table 2). Among clinical manifestations, rhinitis or rhinoconjunctivitis was most strongly associated with a positive SPT result (59.6 %), compared to respiratory symptoms (43.7 %) and dermatological manifestations (32.7 %).

We identified two distinct five-allergen panels, one for children under 3 years of age and one for older children, that could detect over 95 % of sensitised individuals (Table 3). The main difference lies in the choice of one allergen: *Alternaria* for older children and dog dander for younger ones.

4. Discussion

Allergic diseases are expected to affect 50 % of the global population by 2050, according to the World Health Organisation, with children particularly affected by school absenteeism, decreased learning ability, and long-term metabolic and cardiovascular risks [12,13]. Despite this concerning trend, paediatric allergen sensitisation data remain limited. Our study provides recent, real-life data and offers a comprehensive mapping of aeroallergen sensitisation in children across Southern Belgium, highlighting the most relevant allergens.

In Belgium, 200 adults of the ENT department of Ghent participated in a 2009 European study reporting *D. pteronyssinus* (29.9 %), *D. farinae* (26.4 %), grass (25.5 %), cat (18.4 %), dog (17.8 %), birch (17.6 %), hazel (16.6 %), and alder (16.1 %) as the most common sensitisations [8]. An even earlier study, conducted between 1998 and 2002 in one centre participating in the present study, analysed sensitisation patterns in 824 children under 2 years of age [14]. It reported that 28 % of these infants were sensitised to at least one aeroallergen, which was notably associated with exposure to soft toys. *D. pteronyssinus* (39.4 %) was the most common aeroallergens, followed by grass pollen (25.1 %), feathers (20.8 %), dog (20.8 %), and cat (19.5 %). Compared to our data, these results suggest an evolution of sensitisation patterns over the past 20 years.

Distinct profiles are also observed elsewhere. In the Mediterranean, Dramburg *et al.* reported high sensitisation rates to grass pollen (71.8 %), olive tree (50.1 %), house dust mite (48.1 %), ash (37.5 %), and cat dander (37.3 %), with polysensitisation in 82.1 % of cases [7]. However, this cohort included both children and adults, which likely contributed to the higher polysensitisation rate. Additionally, the olive tree is common in Southern Europe but nearly absent in Belgium, where Betulaceae species predominate due to the temperate climate.

SPT positivity rates reported in other epidemiological studies range from 60 % to 85 % [4,6,7], slightly higher than in our cohort. This discrepancy may be explained by our population's very young age and the inclusion of patients with dermatological complaints. In addition, the number of children tested varied widely between centres. These factors, along with differences in centre types (tertiary vs secondary), likely account for the variability in SPT yield. This could be improved through more targeted testing, for instance, by limiting SPT in cases of dermatological complaints, where they are often of limited relevance. Of note, the total number of children tested for ash was low, representing only 12.8 % of the population, and even fewer among those with skin complaints (6.9 %), for whom ash is unlikely to be relevant, which explains the apparently high positivity rate observed for this allergen.

In children under 3 years, some centres have tailored their inhalant allergen panels based on arbitrary age thresholds. We observed low

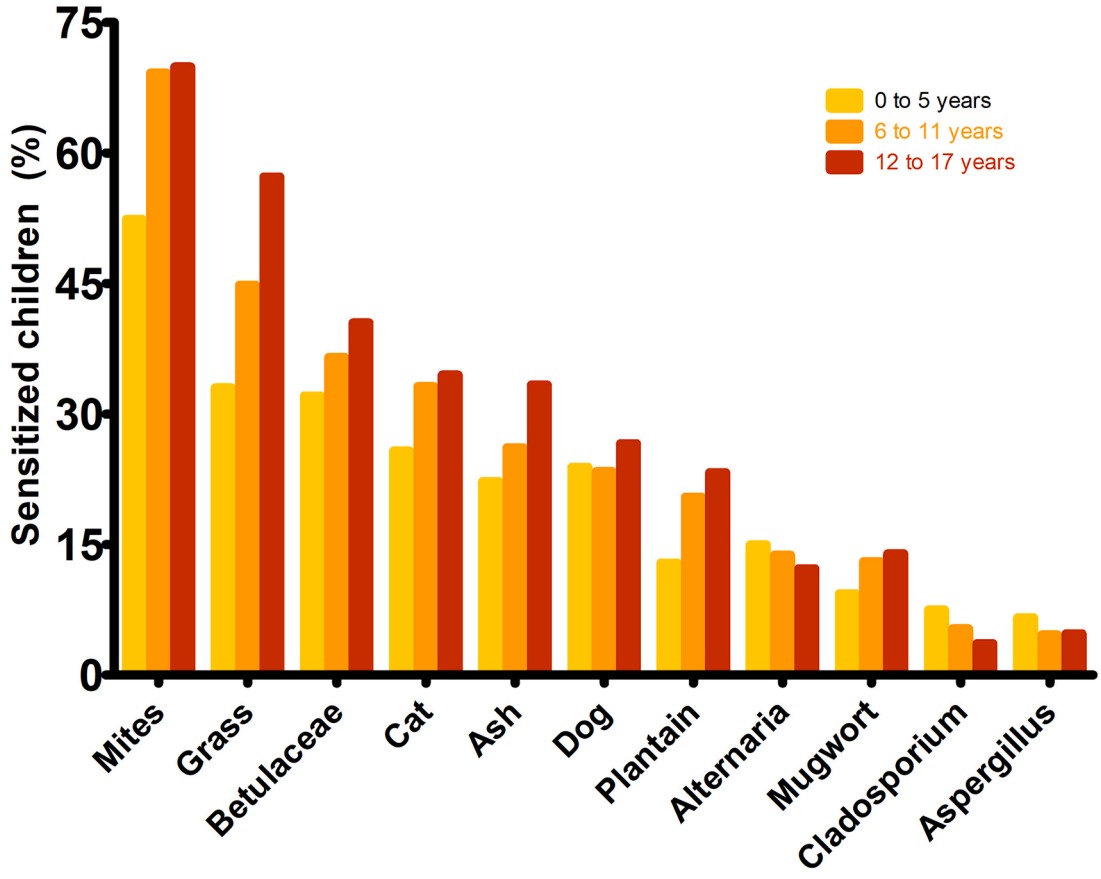

Fig. 3. Sensitisation profile by age groups (ranked by total allergen frequency).

Table 2
Distribution of aeroallergen (mono-)sensitisation by clinical phenotype.

Allergen		Positivity, %		Monosensitisation rate, %	Allergic phenotype, %		
					R	RC	D
Mites	*D. pteronyssinus*	63.9	58.5	32.2	67.1	62.1	62.8
	D. farinae		52.8				
Grass		43.5		11.9	40.8	54.9	46.9
Betulaceae	Birch	35.9	33.2	10.8	34.2	42.1	36.7
	Hazel		27.6				
	Alder		31.3				
	Betulaceae mix		28.2				
Cat dander		31.1		8.1	33.0	30.0	44.0
Ash*		26.2		7.3	27.0	29.9	75.0
Dog dander		24.2		7.7	24.0	25.6	26.1
Plantain		18.6		5.0	16.3	22.4	27.6
Alternaria		13.8		9.1	14.9	12.6	21.2
Mugwort		12.1		6.7	11.6	14.0	12.8
Cladosporium		5.6		8.3	7.5	4.3	10.5
Aspergillus		5.2		7.8	6.6	3.4	5.1

D= Dermatophytus; *R* = Respiratory manifestation; RC = Rhinitis/ rhinoconjonctivitis; D = Dermatological manifestation.
* tested in only 12.8 % of the total population.

positivity rates in this age group, likely reflecting the immaturity of adaptive immunity, the cumulative nature of exposure needed for sensitisation, and the potential for early exposures to promote tolerance [15–17]. Parental anxiety and less reliable clinical history may further contribute to overtesting despite a low pre-test probability.

Several cohort studies conducted in France [15,18], the Netherlands [19,20], Germany [21,22], and the UK [23] consistently show minimal and transient aeroallergen sensitisation before age 3. When present, early sensitizations mostly involve perennial allergens such as HDM or animal dander, rather than seasonal pollens. More stable sensitisation profiles emerge around age 4, in parallel with immune maturation [15, 16]. This likely reflects both environmental influences and immune system maturation. This supports our approach: although test positivity begins to increase around 3.5 years, early identification is desirable to enable timely intervention and environmental management in at-risk children. Accordingly, we selected a 3-year age cut-off to define two minimum allergen panels. Given all these factors, systematic aeroallergen testing in very young children is unjustified and may cause unnecessary anxiety or inappropriate avoidance.

Instead, prevention should focus on promoting immune tolerance

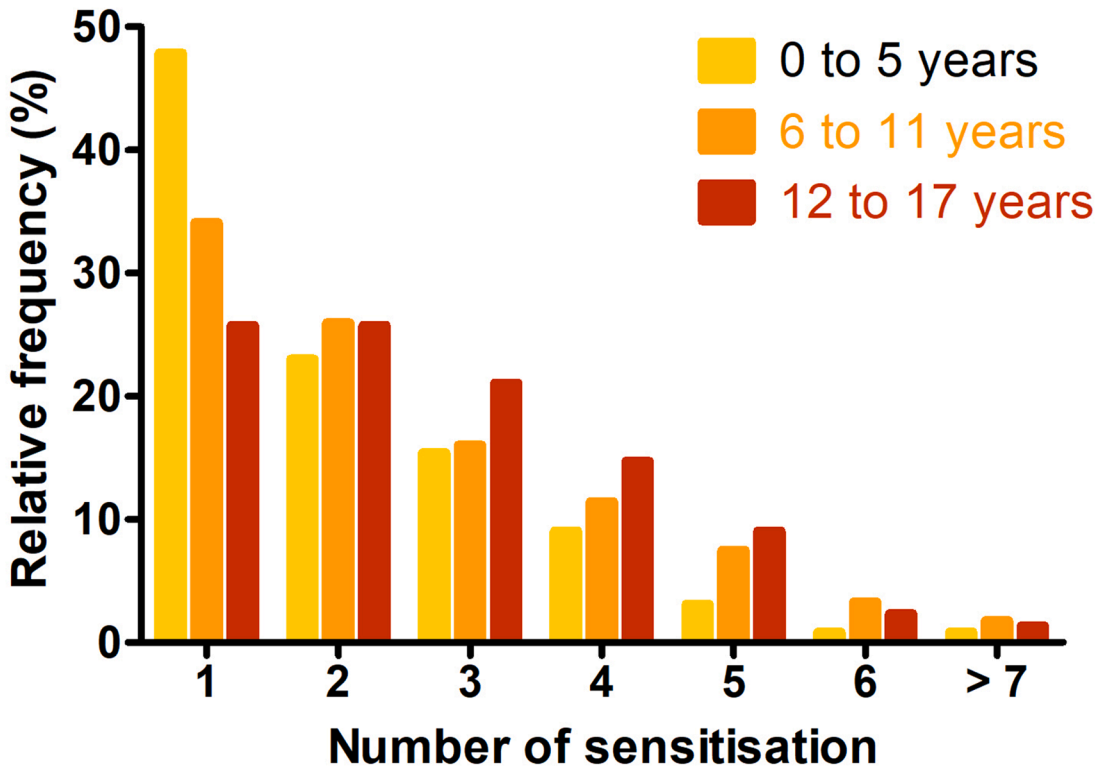

Fig. 4. Sensitisation count by age group.

Table 3
Prevalence of sensitisation according to age groups, allergen ordered from the most prevalent to the allergen with the least increase in identifying additional sensitised subjects.

Allergen	Cumulative prevalence		Increase in identifying sensitised patients by adding allergen in panel	
	n	%	n	%
Children < 3 years				
Mites	60	54.1		
Betulaceae	79	71.2	19	17.1
Dog	91	82.0	12	10.8
Cat	102	91.9	11	9.9
Grass	107	96.3	5	4.5
Alternaria	109	98.2	2	1.8
Plantain	111	100.0	2	1.8
Children 3 to <18 years				
Mites	913	64.8		
Grass	1195	84.8	282	20.0
Betulaceae	1283	91.1	88	6.2
Cat	1330	94.4	47	3.3
Alternaria	1351	95.9	21	1.5
Dog	1371	97.3	20	1.4
Mugwort	1383	98.2	12	0.9
Plantain	1393	98.9	10	0.7
Cladosporium	1400	99.4	7	0.5
Aspergillus	1405	99.7	5	0.4
Ash	1409	100.0	4	0.3

through breastfeeding, controlled early allergen exposure, reduced exposure to pollutants, and maintaining microbial diversity in early life. However, testing retains value in selected cases, especially in boys with strong personal or familial atopic backgrounds or persistent suggestive symptoms [4,14,17,20,24]. These situations underscore the importance of targeted testing rather than systematic screening.

The proposed five-allergen panels identify over 95 % of sensitised patients, providing a practical and efficient diagnostic tool, though not exhaustive. In children already sensitised or presenting multiple allergic manifestations, the panel may be expanded based on clinical judgement to ensure a comprehensive assessment.

Aeroallergen panel selection varies widely across centres and often includes redundant allergens, reflecting historical habits more than clinical necessity. A streamlined minimum panel has been shown to reduce testing costs by up to 52 % [25] while limiting the number of clinically irrelevant SPT, which can be uncomfortable, particularly in children. However, such an approach must be guided by thorough clinical judgement, incorporating environmental exposures, seasonality, and family atopic history.

In our cohort, HDM and pollens were the most frequent sources of sensitisation and were therefore retained in the minimum panel across all age groups. Among pollens, grass was the most common, followed by Betulaceae, particularly birch. Testing timothy grass alone provides no added diagnostic value compared to a standardised five grass mix, which more effectively captures sensitisation. Similarly, testing birch in combination with alder and hazel, or using a Betulaceae mix, is generally unnecessary: birch alone is typically sufficient due to strong IgE cross-reactivity within the Betulaceae family [26,27]. An exception may apply for patients with very early-season symptoms, in whom alder or hazel may play a more direct role [28]. Despite the aforementioned limitations of pollen testing sensitisation in young children, their inclusion in the panel is justified by the trend toward earlier sensitisation observed in recent years [28,29]. This shift may be partly driven by environmental shifts such as prolonged pollen seasons and increased allergenicity [3,28,29] linked to climate change, underscoring the need for continued vigilance even in younger children.

Animal dander (cat, dog) was also frequently positive, though clinical relevance is often uncertain, partly due to the qualitative and quantitative variability in commercial extracts (especially for dog), frequent cross-reactivity between species, and poor correlation with symptoms [30]. Nevertheless, early sensitisation to cat or dog dander has been associated with an increased risk of developing asthma or rhinosinusitis later in childhood [17,20,27], suggesting that such sensitisations in early life may be markers of an atopic predisposition. This

supports the inclusion of dog dander as a perennial aeroallergen in the panel for younger children, but not for older children, where its testing should be clinically guided. Moreover, monosensitisation to dog dander was very rare, questioning the true diagnosis of dog allergy and highlighting the need for careful clinical correlation based on detailed history and symptom assessment.

Among herbaceous plants, plantain was more frequently detected than mugwort. However, neither was included in the minimum panel due to their low positivity rates and limited impact on clinical management in our setting.

Among moulds, only *Alternaria* was the most commonly detected, while *Cladosporium* and *Aspergillus* were rarely observed and, when present, were of limited clinical relevance [31]. Consequently, *Alternaria* was the only mould retained in the minimum panel for the older population. Interestingly, unlike all other aeroallergens, the sensibilisation of these three moulds was slightly higher in the preschool population compared with school-age children and adolescents. However, overall rates remained low, and monosensitisation to moulds was uncommon.

Finally, once sensitisation is confirmed and immunotherapy is considered, molecular allergy testing becomes essential to distinguish true polysensitisation from cross-reactivity, but also because available allergen extracts for immunotherapy are almost exclusively based on major molecular components. As such, extensive SPT panels including multiple related allergens offer little additional clinical value. This reinforces the need for streamlined, evidence-based aeroallergen testing guided by clinical relevance and local epidemiology.

4.1. Limitations

We acknowledge several limitations in our study. First, its retrospective and multicentre design may introduce variability in the execution, precision, and interpretation of SPT, despite standardised protocols. This can lead to overdiagnosis or underdiagnosis, as well as repeated testing during changes in patient management due to a lack of confidence in results. Recently, automated testing systems have emerged [32], offering improved reproducibility, but they can be time-consuming, challenging to implement in the paediatric population, and costly. However, it likely offers a more accurate reflection of real-life clinical practice and covers the entire southern Belgium territory. Second, the lack of uniformity in allergen panels between centres limits direct comparisons but reflects the diversity of approaches in daily care. Third, it would have been interesting to compare the place of residence (urban vs rural areas), as well as the average pollution peaks specific to each place of residence, and to explore the potential association with sensitisation. Fourth, trophallergen sensitisation was not included, even though it's known that during the first years of life, atopic manifestations often shift from digestive to respiratory. Finally, conducting a longitudinal study and extending this study over multiple years would allow for the identification of long-term trends and help minimise biases linked to short-term influences such as seasonal changes or local epidemics.

5. Conclusion

This multicentre retrospective study provides valuable real-life insights into paediatric aeroallergen sensitisation profiles in 2023 in Southern Belgium.

HDM were found to be the predominant allergen, with polysensitisation observed in over 63 % of cases and increasing with age. Our findings demonstrate that two five-allergen panels, one for children under 3 years and one for those over 3, are sufficient to capture more than 95 % of sensitisation, offering a cost-effective and region-specific diagnostic tool.

The study also highlights the low SPT positivity for aeroallergens in children under 3 years, underscoring the importance of adequate test performance and interpretation in this age group to ensure reliable results.

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Declaration of competing interest

The authors declare that they have no potential conflict of interest regarding this submitted manuscript.

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