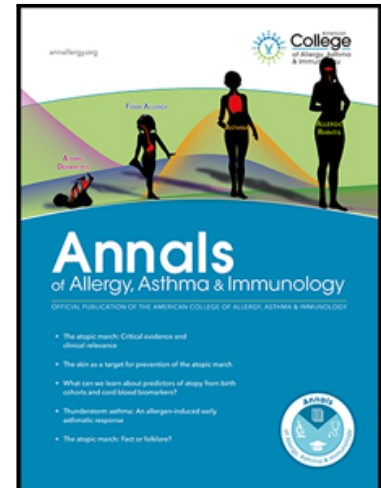


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Characteristics of patients with spontaneous resolution of sesame allergy – Real life experience

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Guri Alex : Substantial contributions to the design of the work and revising it critically for important intellectual content and final approval of the version to be published and agreement to be accountable for all aspects of the work.

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Abbreviations: SPT –skin prick tests, WAO-world allergy organization, SD-standard deviation, AD -Atopic Dermatitis, AR -Allergic rhinitis

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Background : The prevalence of sesame allergy is increasing; strict avoidance is the mainstay of therapy. Lately, sesame oral immunotherapy was presented as an alternative treatment, with a high rate of success. Therefore, data about the natural history and the clinical characteristics of patients with persistent sesame allergy are important for the management of sesame allergic patients.

Objective : To describe the natural history of sesame allergic patients and the clinical characteristics of patients with spontaneous resolution of sesame allergy compared to patients with persistent sesame allergy.

Methods: In our retrospective study, electronic health records of patients with sesame allergy diagnosis were reviewed for demographic and clinical data. Statistical

analysis of clinical characteristics of patients with spontaneous resolution compared to persistent sesame allergy was performed.

Results : One hundred and ninety patients with sesame allergy were followed for 3.86 ± 4.43 years. Sixty one (32.1%) of them had spontaneous resolution of sesame allergy. Patients with mild, early (before the age of 10 months) first sesame allergic reaction, with smaller than 7 mm skin prick test and without concomitant tree nuts allergy had better resolution rate (56.1%).

Conclusion : Sesame allergy spontaneously resolved in about one third of our patients and in more than half of the patients with mild first reaction (grade 1) at a young age (<10 months), with small skin prick test (<7mm) and no concomitant tree nuts allergy. Larger prospective studies, with longer follow up period are needed to better characterize the sesame allergic patients with persistent allergy, who may need oral immunotherapy.

Introduction

Sesame (*Sesamum indicum*) is an edible seed native to Asia and Africa. Archaeological remnants suggest sesame was domesticated in the Indian subcontinent 5,500 years ago. It is traditionally eaten in those areas as a paste called tahini, a sweet called Halva or as toppings on pastries. The reported prevalence of sesame allergy increased in the last years in Europe, America

and Australia since sesame became a popular ingredient in many food products¹⁻³. Sesame allergy was reported as an important cause of food-induced anaphylactic reactions especially in the Middle East^{4,5}. The mainstay of therapy for sesame allergy is strict avoidance⁶. Healthy foods trends make sesame difficult to avoid, especially in the USA, where sesame was included in the food-labeling requirements only recently^{7,8}, with a high rate of accidental exposures⁹. Lately, sesame oral immunotherapy was presented as an alternative treatment, with a high rate of success¹⁰. Data about the natural history of sesame allergy is sparse. Knowing the natural history of sesame allergy will help to improve the management of those patients. Our study describes the natural history of sesame allergic patients and the clinical characteristics of patients with persistent sesame allergy compared to those with spontaneous resolution of sesame allergy, in an allergy center in Israel.

Methods

Patients

The present study is a retrospective cohort study of consecutive patients with sesame allergy diagnosis that were treated in our allergy clinic at the Kaplan Medical Center. Kaplan Medical Center is a university affiliated secondary hospital, serving mainly urban population of about 400,000 people. In our allergy clinic there are about 14,000 visits each year. All electronic health records of patients with a diagnosis of sesame allergy from January 2015 to the end of June 2019 were examined.

Patients with a diagnosis of sesame allergy were included. The diagnosis of sesame allergy was based on recent (last 12 months) allergic reaction to sesame and positive skin prick test to sesame (commercial sesame extract or tahini-raw sesame paste) or

on positive oral food challenge to sesame. Patients with less than two visits in our clinic were excluded. The study was approved by the Kaplan Medical Center ethics committee.

Data collection:

Allergy clinic electronic health records were reviewed for: age, sex, age at the time of first sesame allergic reaction, clinical characteristics and severity of the first allergic reaction and subsequent accidental exposures to sesame. We also collected data about SPT with commercial sesame extract and with tahini at the first and last visit and clinical data regarding concomitant other food allergies, asthma, atopic dermatitis and allergic rhinitis.

Grading the severity of allergic reactions

Allergic reactions were graded according to the World Allergy Organization (WAO) Subcutaneous Immunotherapy Systemic Reaction Grading System¹¹. Grade 1 indicates single organ involvement (cutaneous, conjunctival or upper respiratory tract). Grade 2 indicates symptoms from two organs or more in grade 1 or lower respiratory symptoms such as wheezing, cough, shortness of breath or gastrointestinal symptoms such as cramps, vomiting or diarrhea. Grade 3 indicates bronchoconstriction not responding to bronchodilator or upper respiratory (laryngeal, uvula or tongue) edema with or without stridor. Grade 4 indicates respiratory failure or hypotension. The grade was determined by the physician's clinical judgment. Whenever patients had more than one allergic reaction to sesame (first reaction and subsequent accidental exposures), we included the most severe reaction in the data analysis.

Skin prick test (SPT)

All patients underwent skin prick tests (SPT) in a standard fashion using the Multi-Test II device from Alk-Abello (Round Rock, TX) and commercially prepared sesame extract (1:10 w/v, Alk-Abello). Prick by prick testing with raw sesame paste (Barake tahini, a commercial product contains 240 mg protein/g) was routinely performed in our clinic since 2017. Negative control with saline and positive control with histamine were performed concurrently. The mean wheal and flare diameter were measured in millimeters after 15 minutes. A positive SPT was defined as a wheal diameter ≥ 3 mm larger than the negative control.

Oral food Challenge (sesame)

Oral food challenge was open with a standardized protocol. The starting dose was 1 mg of sesame protein, given as Halva sweet, and the dose was gradually increased every 20 minutes (10 mg, 50 mg, 100 mg, 200 mg, 500 mg, 1000 mg and a maximal dose of 2,000 mg sesame protein). A sesame food challenge was considered positive when the patient had an objective sign of allergic reaction. A sesame food challenge was considered negative when the patient did not have any allergic sign or symptom two hours after the ingestion of the last dose.

Statistical analysis:

Data are presented as means $\pm$ standard deviations. Continuous variables between the study groups were tested for normality by Shapiro- Wilk test and when abnormal distribution was found, non-parametric tests were performed. The Mann- Whitney test was performed to compare the two groups. A repeated measures analysis of variance was used to determine any significant differences between variability over

time. Initial multivariable logistic regression models were built including variables with statistical significance at univariate analysis. Variables were removed from the initial multivariable model using modified backward stepwise selection. Sensitivity analysis for patients with severe allergic reaction to sesame (grade II/III) was also performed using propensity score matching and conditional cox regression. P value <0.05 was considered statistically significant. Data were analyzed using SPSS 21.

Results

The study included 190 sesame allergic patients that were treated in our allergy clinic between 2015 and 2019. Sesame allergy diagnosis at baseline was based on recent allergic reaction to sesame and a positive skin prick test to sesame (133 patients) or a positive oral food challenge to sesame (57 patients). All the patients underwent SPT to commercial sesame extract at baseline. Data regarding SPTs with tahini were available for only 117 patients. Data about specific IgE was available for only the minority of the patients and therefore was not included in our report. Twenty nine (15.2%) sesame allergic patients had negative skin prick test to commercial sesame extract, but positive SPT for tahini. Five patients (2.6%) had negative SPT to both commercial sesame extract and tahini and their sesame allergy diagnosis was based on oral food challenge.

The demographic and clinical characteristics of the patients are presented in Table 1. One hundred and twenty seven (66.8%) were males. The mean age of the patients at the time of their first sesame allergic reaction was 11.04 ± 10.2 months. Most of our patients had mild allergic reaction to sesame with a mean severity score of 1.23 ± 0.51 . As it is shown on Table 1, 79 (41%) of our patients had other concomitant food allergies, mostly to eggs and peanuts (diagnosis was based on recent allergic reaction and positive SPT or oral food challenges). Many of our sesame allergic patients

(46.3%) had other concomitant allergic diseases (atopic dermatitis, asthma or allergic rhinitis).

Resolution of sesame allergy

Sixty one patients had spontaneous resolution of sesame allergy during the follow up period in our clinic (mean 3.86 ± 4.43 years). Diagnosis of sesame allergy resolution was based on negative oral food challenge in most of those patients (49 patients) or on the report of dietary consumption of sesame by the patient or family (12 patients). Due to the retrospective nature of our study, we did not perform routine sesame oral food challenge to all patients. Additional sesame oral food challenges were performed according to clinical judgment, when resolution was suspected, based on the sizes of recurrent SPTs, specific IgE, accidental exposures, severity of the first reaction, the time passed from last reaction, etc. Only 41/129 with presumed persistent sesame allergy actually failed an oral food challenge at the last follow up visit.

Age at the time of first allergic reaction to sesame

Patients with spontaneous resolution of sesame allergy were younger at the time of their first allergic reaction to sesame (9.18 ± 5.24 vs 11.93 ± 11.81 months; $p=0.005$) (Table 2). As can be seen in Figure 1A, patients that were 10 months or older at the time of their first sesame allergic reaction had spontaneous resolution rate of 20.9% (19 out of 91) which was statistically significant lower than a resolution rate of 42.4% (42 out of 99) in patients who had their first sesame allergic reaction at a younger age ($p=0.002$). The mean time of follow up period was longer for patients with persistent sesame allergy compared to patients with spontaneous resolution of sesame allergy, who stopped the follow up visits, if they did not have another food allergy or another allergic disease (4.46 ± 5.03 vs 2.58 ± 2.3 years; respectively, $p=0.019$).

Severity of allergic reaction to sesame

Patients with spontaneous resolution of sesame allergy had milder reactions (severity score of 1.08 ± 0.28 for patients with spontaneous resolution vs 1.3 ± 0.58 for patients with persistent allergy; $p=0.008$) (Table 2). As can be seen in Figure 1B, 56 out of 154 (36.3%) patients with mild allergic reaction (grade 1 according to the WAO grading system) vs 5 out of 36 (13.8%) patients with grade 2 or 3 allergic reactions according to the WAO grading system acquired natural tolerance to sesame ($p=0.001$).

Skin Prick Tests with commercial sesame extract

As can be seen in Figure 1C, 41.3% of the patients with SPT of less than 7 mm to commercial sesame extract at the time of diagnosis, acquired natural tolerance to sesame over time, compared to 10.5% of the patients with skin prick test of 7 mm or more to commercial sesame extract ($p=0.0001$). The mean wheal diameter of the first SPT was smaller with commercial sesame extract compared to the mean wheal diameter of the first skin prick test with tahini (5.52 ± 3.6 ; range 0-20 mm vs 8.3 ± 4.2 ; range 0-24 mm, $p=0.0001$). As it is shown on Figure 2A, the first SPT mean wheal diameter with commercial sesame extract was smaller in the group of patients with spontaneous resolution of sesame allergy compared to the group of patients with persistent sesame allergy, but without statistical significance (5.11 ± 3.53 Vs 5.96 ± 3.13 mm; $p=0.173$). As was expected, the difference between the mean wheal diameters of the two groups was much greater in the last SPT with commercial sesame extract (0.33 ± 1.11 mm for patients with spontaneous resolution vs 4.86 ± 3.69 mm for patients with persistent sesame allergy; $p=0.0001$).

Skin Prick Tests with tahini (raw sesame paste)

The mean wheal diameter of the first SPT with tahini was significantly smaller in patients with spontaneous resolution of sesame allergy compared to patients with persistent sesame allergy with statistical significance (7.37 ± 2.29 Vs 9.7 ± 4.18 mm; $p=0.025$). The difference between the mean wheal diameters was much greater in the last skin prick test with tahini (1.42 ± 2.38 mm for patients with spontaneous resolution, 9.67 ± 5.15 mm for patients with persistent sesame allergy; $p=0.0001$). Data about skin prick tests with raw sesame was available for only 117 patients (Fig 2B).

Other concomitant food allergies and allergic diseases

Patients with persistent sesame allergy had statistically significant higher rates of other concomitant food allergies (51.9% VS 32.8%, respectively; $p=0.009$). Persistent sesame allergy was significantly associated with tree nuts allergy (13.2% of patients with persistent sesame allergy vs 3.3% for patients with spontaneous resolution of sesame allergy; $p=0.034$), but not with allergy to milk, egg or peanuts (Table 2). The rate of other concomitant allergic diseases such as atopic dermatitis, allergic rhinitis and asthma was not significantly different between patients with persistent sesame allergy and those with spontaneous resolution of sesame allergy (Table 2).

Variate analysis

Based on univariate analysis, patients who had their first sesame allergic reaction before the age of 10 months, had a mild allergic reaction (grade 1 according to the WAO grading system), had smaller than 7 mm diameter of SPT with commercial sesame extract and did not have concomitant tree nut allergy had spontaneous resolution rate of 56.1% (32 out of 57). The resolution rate was significantly lower for other sesame allergic patients in our study (21.8%; $p=0.0001$) (Fig 1D).

Multivariable logistic regression models are presented in Table 3. The odds ratio for spontaneous resolution of sesame allergy was 0.497 for males compared to females ($p=0.05$). Older age at the time of first allergic reaction to sesame was associated with reduction of 7.8% in the spontaneous resolution rates for every month ($p=0.019$). Severe reaction to sesame (grade two or three according to WAO) reduced the resolution rate by 67.6% ($p=0.036$). Sensitivity analysis for patients with severe reactions confirmed the primary analysis. Skin prick test of more than 7 mm with commercial sesame extract was associated with 13% reduction of spontaneous resolution rate ($p=0.009$) and concomitant tree nut allergy was associated with 77.7% reduction of spontaneous resolution rate ($p=0.057$).

Discussion

The reported prevalence of sesame allergy is increasing. In Israel, the prevalence of sesame allergy was reported to be 0.18% in 2000⁴, based on history and SPT, and 0.72 % in 2018¹², based on history and SPT or on OFC. A study from the USA reported sesame allergy prevalence of 0.23%, using a cross-sectional population-based survey (based on self-reports)¹. The prevalence of sesame allergy was 0.09% among young Israeli adults², based on IgE sensitization and recent allergic reaction or OFC, and 0.8% in a challenge-proven Australian study³. Sesame allergy is an important cause of food-induced anaphylactic reactions especially in the Middle East^{4,5}. Data regarding the natural history of sesame allergy is sparse¹³⁻¹⁸. Data about the clinical characteristics of patients with spontaneous resolution of sesame allergy and the clinical characteristics of patients with persistent sesame allergy is especially desirable in order to choose the right patients for sesame oral immunotherapy.

It is generally accepted that most allergies to cow's milk, egg, soybean, and wheat are outgrown, whereas most allergies to peanut, nuts, seeds, and shellfish tend to persist into adulthood¹³. In a publication from France 3 out of 14 (21.4%) sesame

allergic children (mean age 5 years, range 5 months -16 years) outgrew their sesame allergy¹⁴. Two publications from Israel reported spontaneous resolution of sesame allergy in 9 out of 45 (20%)¹⁵ (diagnosis was based on clinical history and SPT) and 9 out of 30 (30%) sesame allergic children (diagnosis was based on SPT or SPT and clinical history)¹⁶. In a randomized, cross-sectional survey from the USA, 31 out of 114 (27.2%) patients reported tolerance development at a mean age of 5.9 years¹⁷. In another study, 5 out of 9 (55.5%) sesame allergic patients developed sesame tolerance on reintroduction of sesame¹⁸. In our study, which is larger than previous studies, 61 out of 190 (32.1%) sesame allergic patients had spontaneous resolution of sesame allergy by a mean age of 3.5 years.

The accuracy of SPT using commercial sesame extract and specific IgE for the diagnosis of sesame allergy is suboptimal¹⁹. A combination of commercial sesame extract and tahini yielded higher sensitivity and specificity²⁰. The mean wheal diameter of SPT with tahini in our study was larger at baseline compared to the mean wheal diameter with commercial sesame extract, because of the higher protein concentration and because relevant labile proteins may not be present in the commercial extracts^{21,22}. Higher sensitivity of SPT with tahini raises the concern about mislabeling patients as allergic and biased results. However, the 29 patients (15.2%) that were diagnosed based on recent allergic reaction to sesame and positive SPT to tahini, with negative SPT to commercial sesame extract, had similar resolution rate as the other patients in our study (31%). A combination of skin prick test and basophil activation test has even higher predictive value²³, but it is too expensive for clinical use. In our study, sesame allergy diagnosis was based on a recent (≤ 12 months) allergic reaction to sesame and a positive SPT to commercial sesame extract or tahini in most patients (133). Other patients (57) who had never eaten sesame, but had a positive SPT, patients who had a history of remote or unclear allergic reaction

to sesame with positive SPT or patients with a history of sesame allergy with negative SPT were all challenged to sesame.

In our study, patients that were younger at the time of their first allergic reaction to sesame had higher spontaneous resolution rate (resolution rate of 42.4% for patients with first sesame allergic reaction before the age of 10 months compared to spontaneous resolution rate of 20.9% for patients who were older at the time of their first sesame allergic reaction; $p=0.001$). A cutoff of 10 months was chosen because it was the highest cutoff point with significant statistical difference of resolution rate. Previously, a smaller study from Israel reported an average age of 3.1 years of first allergic reaction for 9 patients with spontaneous resolution compared to 2.2 years for 27 patients with persistent allergy without statistical significance¹⁵. In another publication from the USA (114 children) the mean age at the time of first allergic reaction was much older (4.5 years) with similar rate of acquired natural tolerance (27.1%)¹⁷. Different dietary habits and trends over time are probably responsible for these disparities.

In our study, like in the study of Gupta et al.¹⁷, patients with spontaneous resolution of sesame allergy had originally milder reactions. 36.3% of the patients with mild allergic reaction acquired natural tolerance to sesame, whereas only 13.8% of the patients with more severe reactions acquired natural tolerance ($p=0.0153$). In another study, the severity of allergic reaction did not predict spontaneous sesame allergy resolution, but the number of patients was small¹⁵.

The first SPT mean wheal diameter was smaller for patients with spontaneous resolution of sesame allergy compared to patients with persistent sesame allergy. The difference was statistically significant for SPT with tahini, but not for commercial sesame extract. As was expected, the difference was much greater for both SPT with commercial sesame extract and with tahini, in the last SPT. Patients with first SPT of

less than 7 mm to commercial sesame extract had higher spontaneous resolution rate (41.3%) compared to patients with first SPT ≥ 7 mm (10.5%). A cutoff of 7 mm was chosen because it was the lowest cutoff point with significant statistical difference of resolution rate. A study that evaluated tolerance to cow milk protein through skin prick test described similar results. SPT wheal diameter of less than 7mm was associated with development of natural tolerance to milk over time. Reduction of more than 50% in the mean wheal diameter over time was also a predictor of successful oral food challenge²⁴. Other studies regarding sesame allergy, did not find such correlation, probably due to smaller numbers of patients^{15, 16}.

Persistent sesame allergy was significantly associated with other concomitant food allergies, particularly tree nuts, in our study. Co-sensitization to tree nuts and sesame was demonstrated in a study from 2010²⁵. Another study identified Jug r 6 as the cross reacting allergen between sesame and walnut²⁶. Seed storage proteins such as Ses i 3 and Ara h1 have 80% homology, probably responsible for cross reactivity in SPT, between sesame and peanut²⁷. In a small study which addressed the natural development of sesame tolerance and co-sensitization to tree nuts and peanut, the resolution rate of sesame allergy was 55.5% (5 out of 9). Information regarding the resolution rate of patients with sesame allergy alone compared to resolution rate of sesame allergy in patients with concomitant peanut and tree nuts allergy was not presented¹⁸. In a study that addressed factors associated with reported food allergy tolerance among US children, being allergic to only one food, was associated with better resolution rate¹⁷.

The mechanism that defines transient versus persistent food allergy is unknown. Food specific immunoglobulins, food specific T cell response, the innate immunity and the microbiome were all described as associated with tolerance development in food allergic patients²⁸. The magnitude of specific IgE response (as measured by

SPT) is well known to predict persistence of peanuts and milk allergy^{24, 29, 30}, its importance in sesame allergy was demonstrated in our study.

The combination of early first sesame allergic reaction (before the age of 10 months), mild reaction (grade 1 according to the WAO grading system), smaller than 7 mm diameter of SPT with commercial sesame extract and no concomitant tree nut allergy was predictive for higher spontaneous resolution rate (56.1% in our study). This is in line with a study of 1,245 cases of outgrown food allergies, where mild to moderate reactions and single food allergy were associated with better resolution rate¹⁷.

In our logistic regression model, male sex was associated with persistent sesame allergy. In a study that addressed the sex disparity in food allergy, it was found that more food allergic children are males, whereas among adults, females have more food allergy³¹. There is a need for further investigation to define the role of sex and sex hormones in the pathogenesis and natural history of food allergy. Other factors that were significantly associated with persistent sesame allergy were: older age at the time of first allergic reaction, grade II/III reactions and SPT with commercial sesame extract of 7 mm or more.

The major limitations of our study are related to its retrospective nature. First, oral food challenges were conducted at baseline to confirm sesame allergy in only 57 patients according to the clinical judgment of the treating physician, the rest of the patients were diagnosed based on recent allergic reaction to sesame and a positive SPT to sesame. This approach is acceptable and was used in other studies^{2,4,12}, but might have biased our results. Second, additional sesame oral food challenges to prove resolution were performed according to risk assessment, based on clinical parameters (the sizes of recurrent SPTs, specific IgE, accidental exposures, severity

of the first reaction, the time passed from last reaction, etc.) and the consent of the patients and families. Only one third of the patients with presumed persistent sesame allergy actually failed an oral food challenge at the last follow up visit. The reluctance to perform an OFC biases the results towards a small SPT or less severe initial reaction, which is an artifact of the retrospective design. This probably underestimated the rate of acquired natural tolerance and biased our results toward lower resolution rate. Third, Food challenges were open and not double blind placebo controlled because they are easier to conduct and more appropriate for practical clinical use. Relying on objective findings rather than subjective complains improved the accuracy of our challenges. Another limitation of the study is missing data regarding SPT with tahini in 73 patients.

Sesame allergy spontaneously resolved in about one third of our patients during a follow up period of almost 4 years. Patients who had an early, mild reactions with small SPT wheal diameter and without concomitant other food allergies had higher chances for natural tolerance development. Oral immunotherapy is not needed in most of these patients. Larger prospective studies, with longer follow up period are still needed to better define the clinical features that can predict spontaneous resolution of sesame allergy and to improve the management of sesame allergic patients.

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Table 1. Demographic and clinical characteristics of 190 patients with sesame allergy

Number of patients	190
Males (%)	127 (66.8)
Females (%)	63 (33.2)
Mean age at the time of first sesame reaction $\pm$ SD (range, months)	11.04 $\pm$ 10.2 (4-120)
Severity of sesame allergic reaction* $\pm$ SD (range)	1.23 $\pm$ 0.51; 1-4
Mean age at the last visit $\pm$SD (range, years)	4.96 $\pm$ 4.67 (0.75-33)
Patients with concomitant other food allergies ** (%)	79 (41)
Milk (%)	14 (7.4)
Egg (%)	27 (14.2)
Peanuts (%)	24 (12.6)
Tree nuts (%)	19 (10)
Other (%)	3 (1.6)
Patients with concomitant other allergic diseases	88(46.3)
Atopic Dermatitis (%)	52 (27.3)
Asthma (%)	31 (16.3)
Allergic Rhinitis (%)	12 (6.3)

* According to WAO grading system [11]

** 8 patients had more than one other food allergy

SD-standard deviation, SPT-Skin Prick Test

Table 2. Comparison between the patients with spontaneous resolution of sesame allergy during the period of the study and those with persistent sesame allergy

	Spontaneous resolution of sesame allergy	Persistent sesame allergy	P v a l u e
Total number of patients 190 (100%)	61 (32.1)	129 (67.9)	
Males (%)	36 (59)	91 (70.5)	0.115
Mean age at the last visit $\pm$ SD (years)	3.54 $\pm$ 2.56	5.63 $\pm$ 5.26	0.019
Mean age at the time of first reaction $\pm$ SD (months)	9.18 $\pm$ 5.24	11.93 $\pm$ 11.81	0.005
Severity of allergic reaction	1.08 $\pm$ 0.28	1.3 $\pm$ 0.58	0.008
Concomitant other food allergy	20 (32.8)	67 (51.9)	0.019
Milk (%)	5 (8.2)	9 (6.9)	0.764
Egg (%)	8 (13.1)	19 (14.7)	0.766
Peanuts (%)	4 (6.6)	20 (15.5)	0.083
Tree nuts (%)	2 (3.3)	17 (13.2)	0.034
Other	1 (1.6)	2 (1.05)	0.223
Patients with other diseases (AD, Asthma, AR)	34 (55.7)	54 (41.9)	0.087

SD-Standard Deviation, AD-Atopic Dermatitis, AR -Allergic rhinitis

Table 3. Multivariable logistic regression of variables with statistical significance for spontaneous resolution of sesame allergy

Variable	Odds Ratio	Lower 95% confidence limit	Upper 95% confidence limit	P value
Sex (male)	0.497	0.247	1.000	0.05
Age at the time of first allergic reaction to sesame (months)	0.922	0.862	0.987	0.019
Severity of allergic reaction >1*	0.324	0.113	0.928	0.036
Skin prick test ≥ 7 mm (with commercial sesame extract)	0.870	0.783	0.967	0.009
Concomitant tree nuts allergy	0.223	0.047	1.047	0.057

* According to WAO grading system [11]

Figure 1.

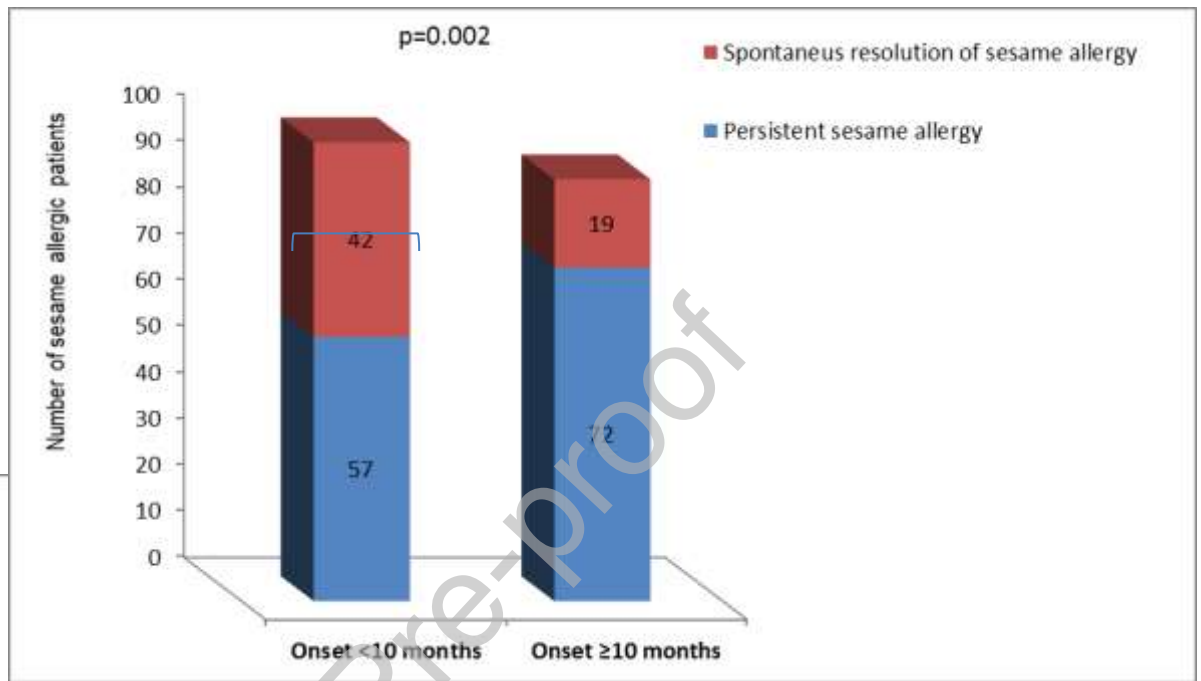


Fig 1B

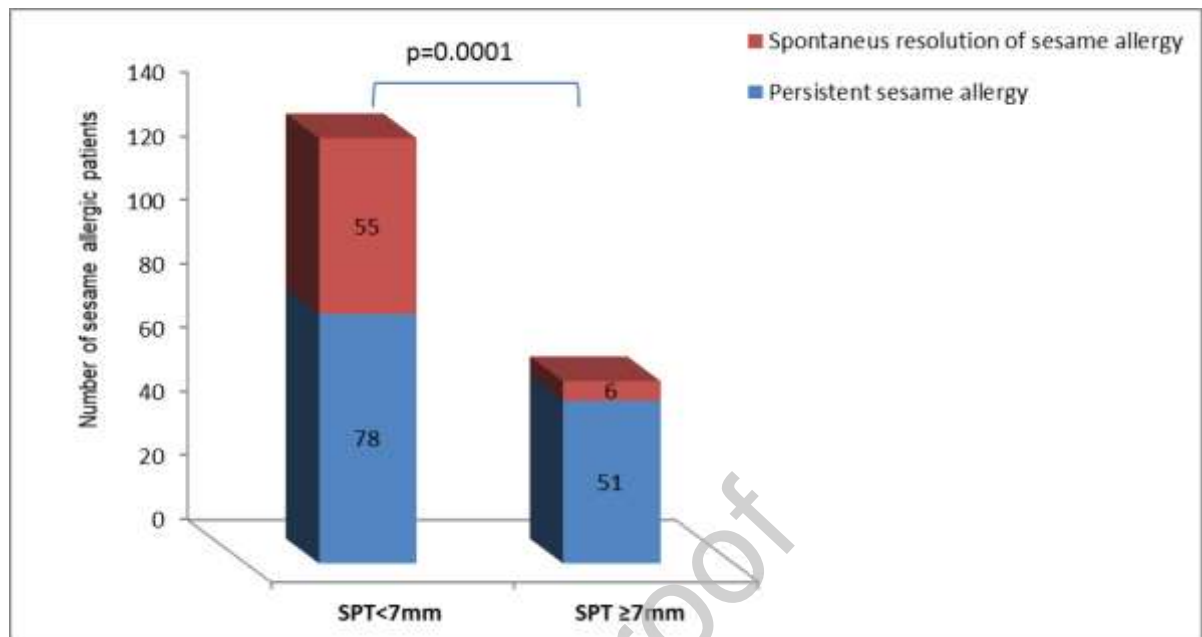


Fig 1C

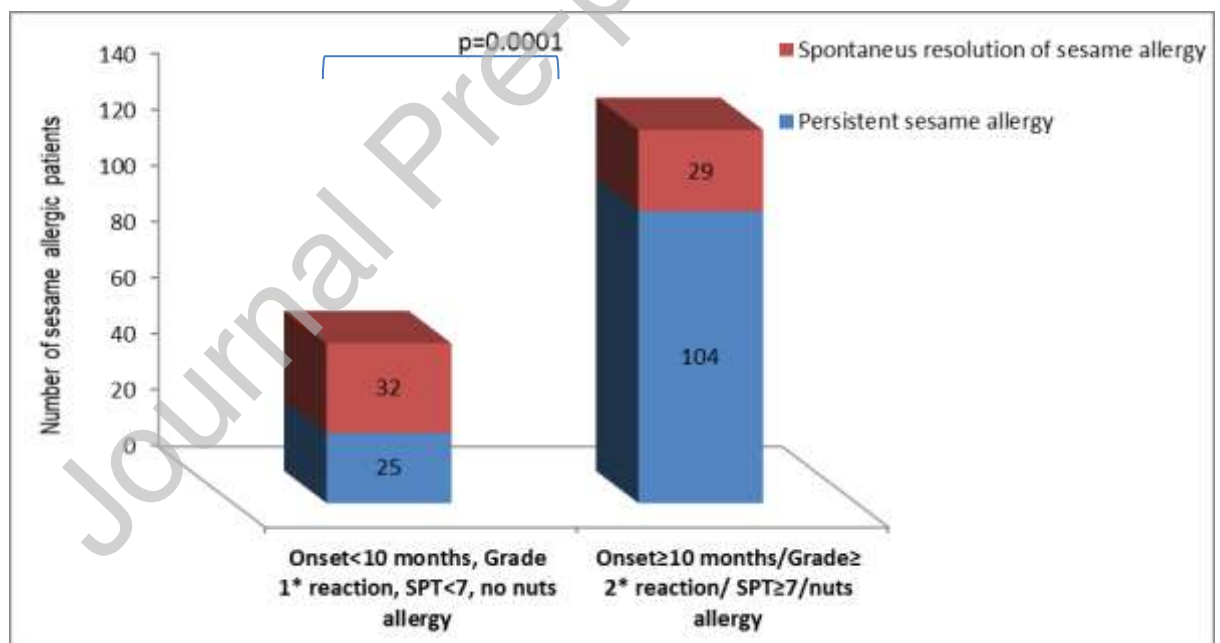


Fig 1D

Legend to Figure 1

Spontaneous resolution and persistence of sesame allergy according to clinical characteristics: age at first sesame allergic reaction (1A), severity of allergic reaction (most severe) according to WAO grading system (1B), mean SPT wheal diameter

with commercial sesame extract at the time of diagnosis (1C) and a combination of these characteristics with concomitant tree nuts allergy (1D).

Figure 2.

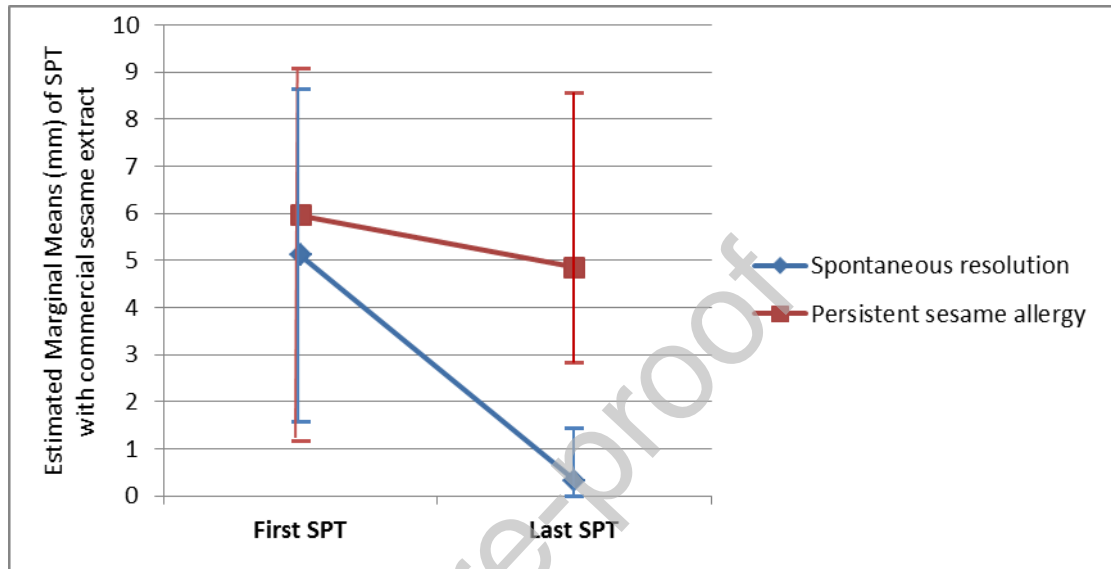


Fig. 2A

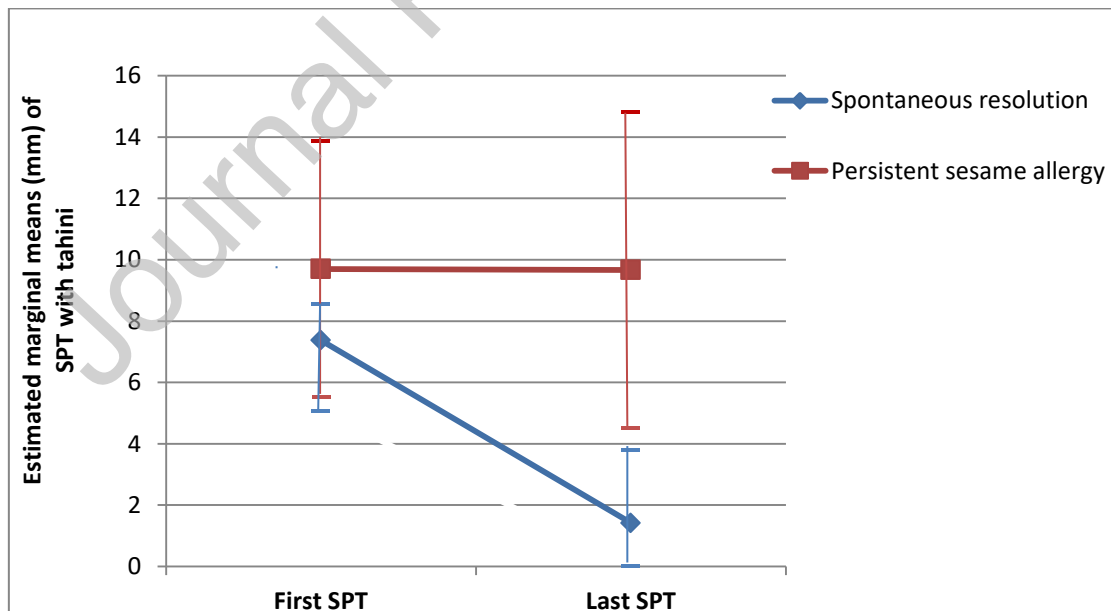


Fig 2B

Legend to Figure 2

Estimated marginal means of SPT wheal diameter (mm) at first and last visit in patients with spontaneous resolution of sesame allergy compared to patients with persistent sesame allergy with commercial sesame extract, 190 patients (A) and with tahini, 117 patients (B).