

ORIGINAL PAPER

A cross-sectional study on the prevalence of food allergy to eggplant (*Solanum melongena* L.) reveals female predominance

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Clinical and Experimental Allergy

Summary

Background Only a few case reports of allergy to eggplant (*Solanum melongena*) have been reported. A relatively large number of individuals appear to experience food-related symptoms to eggplant in India.

Objective The major aims of this study are to assess the prevalence of food allergy to eggplant and analyse the age and gender distribution.

Methods Seven hundred and forty-one subjects (age range: 5–60 years) randomly selected from rural and urban areas of Mysore city were analysed for the prevalence of eggplant allergy based on case history, skin prick test (SPT) with eggplant extracts and allergen-specific IgE. The age and gender distribution for the prevalence of eggplant allergy and its association with other atopic conditions were assessed.

Results Sixty-eight (9.2%) subjects reported adverse reactions to ingestion of eggplant, of which 32 (4.3%) subjects had positive history/positive SPT and 36 (4.9%) had positive history/negative SPT. Sixteen (2.2%) subjects had negative history/positive SPT. Ten subjects (1.4%) experienced allergic symptoms in < 2 h. Sensitization to eggplant by SPT was more in atopic (16.7%) compared with non-atopic subjects (3.8%). All the SPT-positive subjects ($n = 48$) underwent evaluation for eggplant allergen-specific IgE, which was detected in 6 subjects (0.8%). Majority of the subjects sensitized to eggplant were in the age groups 16–45 years, and females were twice as likely to be sensitized as males. Female predominance (4 : 1) is more in the 16–30 year group.

Conclusions Many subjects experience adverse reactions to the ingestion of eggplant, possibly due to the pharmacologic action of histamine and other non-protein components, rather than to specific protein allergen(s). The prevalence of IgE-mediated eggplant allergy is estimated at ~0.8%, with higher rates of sensitization in females.

Keywords allergen-specific IgE, eggplant, food allergy, gender, prevalence, skin prick test

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Introduction

Even though most of the world's population lives in Asia, there is a paucity of scientific data on the prevalence and clinical features of food allergy, mainly due to (1) lack of awareness of the problem, and (2) lack of large, well-designed epidemiological studies. For many years, it was believed that the prevalence of allergic diseases, including food allergy, was low in Asia. Recent studies describing the pattern of anaphylaxis and the role of food triggers show that food is an important cause of severe allergic reactions in Asia [1]. Although about one-third of the world's population perceives that it is allergic to one or

more foods, the actual incidence of food allergy is estimated at 2–4% in adults and 6–8% in children [2].

Allergy to milk, egg and seafood is universal to all the countries. There are, however, some unique and unusual food allergies first described in Asia, but are not seen in other countries. These foods include bird's nest (edible nests of swiftlets belonging to *Collocalia* spp., Singapore); buckwheat (*Fagopyrum esculentum*, China); chickpea (*Cicer arietinum*, India); black gram (*Vigna mungo*, India); lima bean (*Phaseolus lunatus*, India); rice (*Oryza sativa*, Japan and India) and sesame (*Sesamum indicum*, Israel) [3–10]. In addition, a large population world-wide has

reported allergic reactions to ingestion of Solanaceous vegetables, namely, potato, tomato and bell pepper, and several allergens have been identified [11]. In contrast, hypersensitivity reactions to ingestion of eggplant have only been reported in a few case studies [12–15], and are attributed to cross-reactivity with tomato, latex and grass/weed pollens.

Eggplant (aubergine, brinjal, *Solanum melongena*), popularly known as 'poor man's meat' in the Indian sub-continent, ranks twelfth among the leading vegetable crops of the world [16, 17]. Consumed widely in Asia and Europe, it is used primarily as a cooked vegetable. A considerable number among the Indian population often perceive adverse reactions to eggplant. Therefore, we decided to study the prevalence of allergy to ingestion of eggplant based on detailed case history, skin prick test (SPT) and the presence of allergen-specific IgE. Here, we report the prevalence of eggplant allergy in relation to age, gender and its association with atopic history of study subjects in a random population residing in and around Mysore city.

Materials and methods

Selection of subjects

Seven hundred and forty-one individuals in the age range 5–60 years were recruited randomly from rural and urban areas of Mysore city (Mysore district, Karnataka, India) for screening of food-allergic reactions to eggplant. A detailed case history of the subjects was taken based on a structured questionnaire containing information regarding age, gender, occupation, age at onset of disease and the present status. In addition, type of complaints [cutaneous (C), respiratory (R), gastrointestinal (GI) and/or neurological (N)], allergy to other foods, house dust mite (HDM) and/or pollens, allergy to insects, contact agents and duration of onset of allergic symptoms after ingestion of the offending food were recorded. Atopy was defined as having a positive SPT to any one of the following: HDM, grass/weed pollen and insects. The study was undertaken following approval by the Institutional Ethics Committee.

Preparation of allergenic extracts from eggplant

Freshly obtained, local variety (Mysore green) of eggplant having greenish, long appearance was used. Eggplant extract was prepared by blending 50 g eggplants in a blender using 50 mL of 10 mM sodium phosphate buffer, pH 7.4, containing 140 mM NaCl (PBS) and 100 mM L-ascorbic acid (to prevent enzymic browning reaction), centrifuged at 5300 × g for 20 min, filtered through Whatman no. 1 filter, lyophilized, stored at –20 °C and portions of it were reconstituted before SPT (eggplant extract prepared this way is designated as EE hereafter). Addi-

tionally, the EE was dialysed using 12–14 kDa cut-off membrane against three changes of double-distilled water and subjected to acetone precipitation. The precipitate was resolubilized in PBS; this is designated as eggplant concentrate (EC). Both the extract and the concentrate were glycerinated to a final concentration of 50% v/v, and the protein content of the extracts used for SPT was adjusted to 0.5 mg/mL. Because SPT reactivity and allergen-specific IgE detection in eggplant-allergic cases were similar with both raw and cooked EEs in our earlier study [12], only raw EE was used for testing in this study.

Skin prick test using eggplant extracts

SPT was performed as per the standard procedure [18] using sterile prick lancetter (Bayer Pharmaceutical Division, Spokane, WA, USA). Eggplant allergenic extracts, EE and EC, along with controls (positive: histamine dihydrochloride equivalent to 1 mg/mL histamine base, and negative: 50% glycerinated PBS) were used for SPT. Each sample was pricked with a separate sterile lancet to avoid carryover of the sample. The weal and flare diameters were measured after 20 min. A weal diameter of > 3 mm compared with negative control was considered as positive prick test. Because prick-to-prick (PTP) test produced slightly lower response compared with SPT in the case of three eggplant-allergic subjects in our earlier study [12], only SPT was used in this study.

Detection of allergen-specific immunoglobulin E

Detection of allergen-specific IgE by direct ELISA [19] was carried out using sera from SPT-positive subjects. Microtitre wells (Maxisorp; Nunc, Roskilde, Denmark) were coated at 4 °C overnight with EE (~30 µg protein/well) that had been dialysed using 3.5 kDa cut-off membrane against 100 mM carbonate-bicarbonate buffer, pH 9.6, as per our earlier studies [12, 15]. This was followed by incubation with 100 µL allergic or normal serum (1:3 dilution). Alkaline phosphatase-conjugated mouse anti-human IgE (Sigma-Aldrich Co., St Louis, MO, USA) was used as the secondary antibody (1:1000 dilution). The absorbance was measured at 405 nm using *p*-nitrophenyl phosphate as the substrate. When the A_{405} values were twofold higher than those of normal subject's sera (serum pooled from five healthy subjects), the ELISA was considered positive.

Statistical analysis

To test differences in proportions between groups, the chi-square test was used. The Student's *t*-test and, when appropriate, one-way analysis of variance (ANOVA) were used to assess differences in means between groups. A *P*-value of <0.05 was considered to be statistically

Table 1. Subject demographic characteristics

	<i>n</i>	Age	Gender		Dwelling	
		Mean±SD	Male (%)	Female (%)	Rural (%)	Urban (%)
Total	741	35.6±17.0	386 (52.2)	355 (47.8)	304 (41.1)	437 (58.9)
Non-atopic subjects	586	34.6±16.4	304 (51.9)	282 (48.1)	252 (43.1)	334 (56.9)
Atopic subjects	155	39.2±18.9	82 (52.9)	73 (47.1)	61 (39.4)	94 (60.6)

Table 2. Analysis of adverse reactions to eggplant based on the organ system affected

Organ system affected	Number of subjects with positive history (%)	Number of subjects affected by each organ system	Specific symptoms (number of subjects)
Any of the organ system affected	68 (100)	n.a.*	n.a.*
Cutaneous (C)	40 (58.8)	(a) Only C: 30 (b) C+other organ system: 10	Skin rashes and itching all over the body (15) and localized (25)
Respiratory (R)	20 (29.4)	(a) Only R: 13 (b) R+other organ system: 7	Wheezing (17), allergic rhinitis (3)
Gastro-intestinal (GI)	10 (14.7)	(a) Only GI: 8 (b) GI+other organ system: 2	Gastric-reflux/cramping/bloating (9) and diarrhea (1)
Pharyngeal (P)	7 (10.3)	(a) Only P: 1 (b) P+other organ system: 6	Throat itching (6) and swelling (1)
Ocular (O)	6 (8.8)	(a) Only O: 0 (b) O+other organ system: 6	Eye itching (4), reddening and oedema (2)

*n.a., not applicable.

significant. All the statistical analyses were done using a software SPSS version 10 (SPSS Inc., Chicago, IL, USA).

Results

In the present study, a total of 741 subjects were screened for food-allergic reactions to ingestion of eggplant based on detailed case history, SPT and presence of eggplant allergen-specific IgE. Subject demographic characteristics are indicated in Table 1. The study population comprised 304 (41%) rural and 437 (59%) urban individuals. The gender distribution was nearly equal (males 52%, females 48%). The population comprised 586 (79.1%) healthy normal subjects and 155 (20.9%) with a history of atopy.

Analysis of adverse reactions to eggplant ingestion

Among the 741 subjects screened, 68 subjects (9.2%) reported adverse reaction to ingestion of eggplant. The organ systems affected as reported by the subjects with a positive history include mostly cutaneous (58.8%), respiratory (29.4%), gastrointestinal (14.7%), pharyngeal (10.3%) and ocular (8.9%). The clinical symptoms experienced by the subjects are indicated in Table 2. When the duration of onset of adverse reactions or allergic symptoms after the ingestion of eggplant was considered, only

10 (15%) out of 68 subjects with a positive history reported experiencing allergic symptoms within 2 h of ingestion on multiple occasions, which accounts for 1.4% of the total population analysed for eggplant allergy, and 85% of the subjects with a positive history experienced mostly delayed reactions after 4 h.

Both case history and SPT were positive in 32 (4.3%) subjects. In case of 36 (4.9%) subjects, history was positive, but SPT was negative. Although 16 (2.2%) subjects had no prior experience of adverse reactions to eggplant, SPT was positive, indicating possibility of asymptomatic sensitization in some subjects (Table 3).

Skin prick test reactivity

Significant differences were observed in the number of SPT-positive and SPT-negative subjects ($P < 0.01$) in the overall population screened for eggplant allergy. This was also true when the individual age group was considered separately. SPT with EE was positive in 48 (6.5%) subjects, while the remaining 693 (93.5%) subjects had a negative prick test. There was no significant difference observed between rural and urban subjects in sensitization to eggplant by SPT. When the study population was stratified into four age groups (5–15, 16–30, 31–45 and 46–60 years), significant differences were observed between age groups ($P < 0.05$) for the prevalence of eggplant allergy based on SPT with EE, and the prevalence was 2.8%, 7.5%,

Table 3. Analysis of adverse reactions to eggplant based on case history and skin prick test (SPT) results

Case history to eggplant	SPT with eggplant extract (EE)	Number of subjects, <i>n</i> (%)	Inference
+	±	68 (9.2)	Adverse reaction to ingestion of eggplant
+	+	32 (4.3)	Food allergy to eggplant
+	—	36 (4.9)	Food intolerance to eggplant
—	+	16 (2.2)	Asymptomatic sensitization (cross-reaction to other foods/pollens)
—	—	657 (88.7)	Normal subjects

7.8% and 4.9% in the aforementioned age groups, respectively. Sensitization to eggplant by SPT was significantly higher among atopic (16.7%) compared with non-atopic (3.8%) subjects screened for eggplant allergy ($P < 0.01$). This difference between atopic and non-atopic subjects was more pronounced in the age groups 16–30 years (34.5% vs. 4.4%) and 31–45 years (22.7% vs. 3.4%), as shown in Fig. 1 (panel a). Striking differences were also observed between children and adults (2.8% vs. 6.9%) in sensitization to eggplant by SPT. However, this difference was statistically non-significant.

On analysis of the gender distribution, it was noted that sensitization to eggplant was significantly higher in females ($P < 0.05$) despite the gender distribution in the sample being nearly equal. It was observed that females were twice as likely to be sensitized to eggplant as males (2 : 1). This difference was further amplified in the 16–30 years age group (Fig. 1, panel b), wherein females were four times as likely to be sensitized to eggplant as males (4 : 1).

Further, when the study population was analysed for differences in the SPT reaction between EE and EC, there was a significant ($P < 0.01$) reduction in the number of SPT-positive subjects with EC (Fig. 2, panel a). Twenty-one (2.8% of 741 subjects tested) out of 48 EE-positive subjects have shown positive SPT with EC. When the study population was stratified into four age groups (5–15, 16–30, 31–45 and 46–60 years), the prevalence of eggplant allergy based on SPT with only EC was 2.7%, 4.8%, 2.1% and 1% in the aforementioned age groups, respectively. There was a 56% reduction in the number of subjects SPT positive to EC compared with that to EE (Fig. 2, panel a). A similar trend was observed in male ($P < 0.01$) and female ($P < 0.05$) subjects, when the genders were analysed separately (Fig. 2, panel b). In case of females, there was ~42% reduction in the number of SPT positives to EC compared with that to EE, while it was ~82% in case of males. When the SPT differences were analysed among the four age groups between EE and EC, there was significant reduction in the number of SPT-positive subjects with EC in the age groups 16–30 years (38%, $P < 0.05$), 31–45 years (73%, $P < 0.01$) and 46–60 years (80%, $P < 0.01$) compared with EE (Fig. 2, panel a). However, the number of SPT-positive subjects in the age group 5–15 years remained constant with both EE and EC.

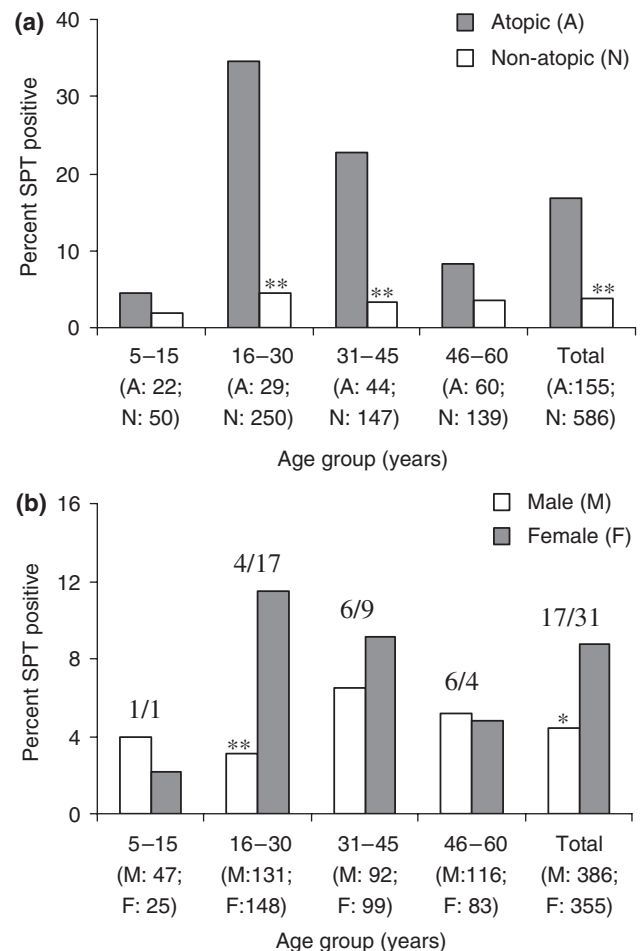


Fig. 1. Prevalence of eggplant allergy based on positive skin prick test (SPT) with eggplant extract (EE) between atopic and non-atopic subjects in different age groups (panel a) and gender distribution within individual age groups (panel b). Figures in parentheses indicate the number of subjects tested in each category. * $P < 0.05$; ** $P < 0.01$.

Eggplant allergen-specific immunoglobulin E

When the allergen-specific IgE was analysed in the serum samples of SPT-positive subjects, there was a significant difference ($P < 0.01$) in the A_{405} values (range: 0.184–0.616) among the SPT-positive subjects. Six subjects showed significantly higher A_{405} values compared with normal subjects ($P < 0.01$), indicating the presence of eggplant allergen-specific IgE (Fig. 3), which corresponds

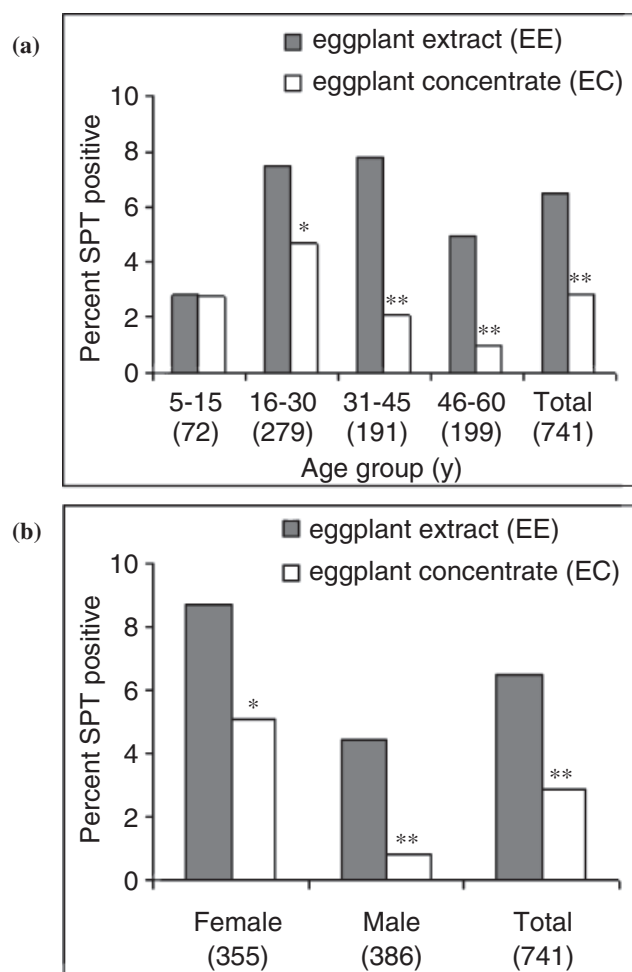


Fig. 2. Comparison of prick-test positivity with the eggplant extracts (EE and EC) in different age groups (panel a) and gender (panel b) ($P < 0.01$ for stratification by age groups). * $P < 0.05$; ** $P < 0.01$. Figures in parentheses indicate the number of subjects tested in each age group.

to approximately 0.8% of the population screened for eggplant allergy. Out of six subjects having eggplant allergen-specific IgE, five (83.3%) subjects belonged to the 16–30 years age group, and the remaining 1 (16.7%) to the 31–45 years age group. Further, the gender distribution for eggplant allergen-specific IgE was 5 : 1 (female : male).

Association between case history, skin prick test and atopy

Among the 68 subjects with reported history of adverse reactions to eggplant, 32 (47.1%) had positive prick test, while the remaining 36 (52.9%) had a negative prick test with EE. Of the 673 subjects without any clinical history, 16 (2.2%) had a positive prick test (Table 4). Among the 741 subjects, 155 (~21%) had reported history of atopy. The association between atopy and positive prick with EE was significant ($P < 0.05$). Twenty-six (16.7%) out of 155 atopic subjects had shown positive prick, whereas 22 (3.8%) among the 586 subjects without clinical history of atopy had shown positive SPT.

The predictive value of diagnostic SPT [19] for EE was calculated and is shown in Table 4. It was observed that the specificity and negative predictive value of SPT to detect eggplant allergy were 97.6% and 93.5%, respectively. However, the sensitivity of SPT to detect eggplant allergy was 47% with a positive predictive value of 66.7%. The overall efficiency was 93%. Similarly, the predictive value of diagnostic SPT for EC was calculated (data not shown). It was observed that the specificity and negative predictive value of SPT with EC to detect eggplant allergy were 99% and 93%, respectively. But the sensitivity of SPT to detect eggplant allergy

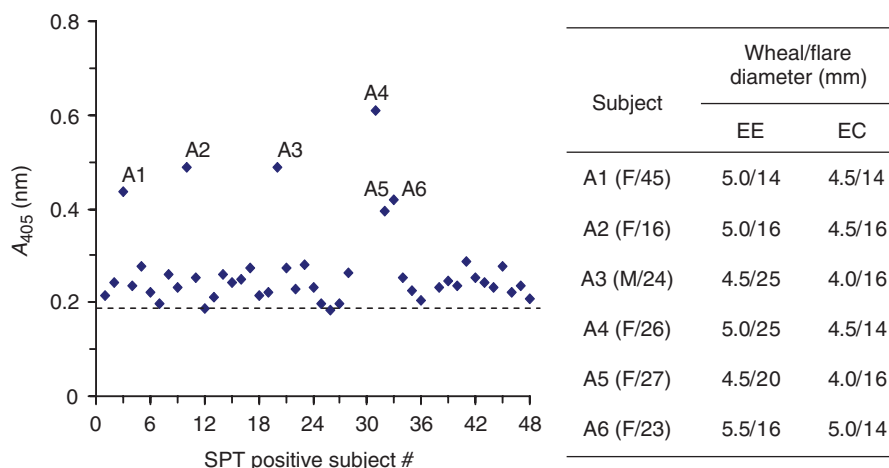


Fig. 3. Detection of eggplant allergen-specific IgE among SPT-positive subjects by ELISA. The dashed line represents the A_{405} value (0.191) of negative control (pooled serum from five healthy non-atopic subjects). Serum was unavailable in the case of subjects no. 30 and 37. Inset shows the wheal/flare diameters of six SPT-positive subjects (labelled A1–A6) having significantly higher A_{405} values than other atopic subjects with SPT positivity to eggplant. Non-atopic subjects showed wheal/flare diameters of 0–1/0 for both EE and EC.

Table 4. Association between case history, skin prick reactivity to eggplant extract (EE) and history of atopy

	History of adverse reaction to eggplant*			History of other atopy		
	Positive	Negative	Total	Positive	Negative	Total
Positive prick	32 (47.1) [†]	16 (2.4)	48 (6.5)	26 (16.7)	22 (3.8)	48 (6.5)
	TP	FP	TP+FP			
Negative prick	36 (52.9)	657 (97.6)	693 (93.5)	129 (83.3)	564 (96.2)	693 (93.5)
	FN	TN	FN+TN			
Total	68	673	741	155	586	741

*Number of subjects with: TP (true positive), correctly identified by a positive SPT to eggplant allergenic extract with a history of eggplant allergy; FP (false positive), a positive SPT to eggplant allergenic extract without a history of eggplant allergy; FN (false negative), a negative SPT to eggplant allergenic extract with a history of eggplant allergy; TN (true negative), a negative SPT to eggplant allergenic extract without a history of eggplant allergy.

[†]Percentage values of SPT (positive or negative) are given in parentheses.

Diagnostic sensitivity (percentage positivity) = $TP/(TP+FN) \times 100 = 47.1\%$.

Diagnostic specificity (percentage negativity) = $TN/(TN+FP) \times 100 = 97.6\%$.

Positive predictive value = $TP/(TP+FP) \times 100 = 66.7\%$.

Negative predictive value = $TN/(TN+FN) \times 100 = 93.5\%$.

Efficiency = $(TP+TN)/(TP+FP+FN+TN) \times 100 = 93.0\%$.

was only 25% with a positive predictive value of 81%. The overall efficiency, however, remained the same (92.5%).

Discussion

Studies on food allergy in Asia consist mainly of questionnaire surveys in individuals with atopic disease and have seldom used specific IgE or confirmed the allergy by food challenges. Although adverse reactions to ingestion of eggplant have often been perceived in the Indian population, there are no detailed studies regarding the assessment of the prevalence of allergic reactions to eggplant or other foods. Here, we have made an attempt to assess the prevalence of eggplant allergy in relation to age and gender, based on self-reported case history and allergy diagnostic tests (SPT and eggplant allergen-specific IgE). Self-reported prevalence of food allergy varied from 3% to 35% for any food in a meta-analysis study reported recently [20].

The incidence of adverse reactions to eggplant based on case history (9.2%) and SPT with EE (4.3%) is rather high for any class of food in the general population; in the case of eggplant, this could be due to the presence of endogenous biological amines such as histamine (3.8 mg), serotonin (0.2 mg), tryptamine (0.05–0.3 mg) and tyramine (0.3 mg) per 100 g eggplant (fresh weight) and some secondary metabolites [15, 21, 22]. Adverse food reactions can also be caused by pharmacological, metabolic, toxic and idiosyncratic reactions. It is known that histamine-containing foods such as cheese, vegetables (spinach, eggplant and tomatoes), certain meats and red wines can cause 'dry' flushes and produce histaminuria [21–23]. Therefore, it is highly likely that many subjects experience non-IgE-mediated adverse food reactions to the ingestion of eggplant. The most dominant clinical presentation of

eggplant allergy is cutaneous contrary to the oral allergy syndrome (OAS), commonly seen with allergy to most fruits and vegetables. This is possibly because eggplant contains a wide spectrum (both proteins and non-protein substances) of allergens [12–13, 15] and is consumed almost always in cooked form as against most fruits and vegetables that are consumed raw.

In this study, only few subjects (1.4%) experienced adverse reactions within 30 min to 2 h of ingestion, indicating the characteristic type I hypersensitivity. Delayed reactions in majority of the subjects with a positive history may often be due to mechanisms that are non-IgE mediated or immune complex-mediated hypersensitivities. The negative SPT/positive history in some subjects is likely due to non-allergic food hypersensitivity. The asymptomatic sensitization in few subjects could be attributed to possible cross-reactivity between eggplant and other food/non-food allergens [14, 24, 25], which needs further evaluation to study whether it is a precursor for clinical sensitivity and why in these patients, who may have specific IgE, there are no clinical reactions.

The significant difference between age groups in the prevalence of eggplant allergy with both EE and EC indicates the possible influence of age on the skin prick reactivity. More than 70% of the SPT-positive subjects belonged to two age groups 16–30 and 31–45 years for both EE and EC, clearly indicating that young adults and middle-aged people (15–45 years of age) appear to be the main risk group for eggplant allergy. This is also true when the allergen-specific IgE to eggplant was considered (16–30 years: five subjects; 31–45 years: one subject). This interesting finding may be due to the fact that teens, adolescents and middle-aged people probably are the population groups most frequently consuming the offending food both at home as well as outside home. Our results

with regard to distribution of age for eggplant allergy have close resemblance to results from the Norwegian register for food allergies [26].

The female-over-male dominance for sensitivity to eggplant in the overall population (~2:1) and its further amplification in the age group 16–30 years (4:1) clearly show the increased skin reactivity of females to EE, indicating the high prevalence of adverse reactions to eggplant in adult females. The gender differences were also observed when the allergen-specific IgE was considered, wherein five out of six subjects having specific IgE to eggplant were females. Virtually nothing is known about the consumption behaviour of eggplant among males and females. These gender differences are strikingly similar to the reported cases of asthma, wheeze, allergic rhinitis and other atopic conditions [27–29]. It is evident from the literature that food allergy is more common among women, and that gender differences are well known for allergic diseases [30, 31]. In general, data from large epidemiological studies reported a male predominance of asthma, allergic rhinitis, food allergy and/or other atopic conditions before puberty, and a female predominance after puberty [30–32]. A similar trend was observed in the case of self-reported allergy to peanut and tree nuts in the USA [33]. Studies suggest that some female sex steroids are pro-inflammatory and increase the susceptibility to atopy [34, 35]. Testosterone is a powerful inhibitor of histamine and known to inhibit mast cell degranulation, while estradiol is known to enhance IgE-dependent mast cell activation [34, 35].

The reduction in the number of SPT positives with EC compared with EE was quite significant between age groups as well as genders. This reduction was more evident with an increase in age and was more pronounced in male subjects, as older age and male sex are associated with higher skin prick response to histamine [36]. The absence of histamine, secondary metabolites and low molecular weight proteins of <12–14 kDa in EC appears to be a major cause for reduction in SPT response with EC. Hence, there is a possibility of high proportion of false positives in SPT with EE, which may lead to overestimation of the incidence of eggplant allergy. The low molecular weight allergenic proteins in plant foods generally include lipid transfer protein, 2S albumin and profilin [37]. The absence of allergen-specific IgE for eggplant in many SPT-positive subjects could be attributed to (1) down-regulation of the IgE immune response due to prolonged avoidance of the offending food; (2) presence of circulating immune complexes between food allergens and allergen-specific IgE and also between allergen-specific IgE and anti-IgE (normally of IgG and IgM classes) and (3) the allergen in question being a low molecular weight hydrophilic molecule incapable of binding to ELISA plates [15, 38, 39], which may directly and non-specifically activate mast cells.

Generally, food allergy tends to occur in subjects who also have inhalant allergies, but it is not always so [40]. The association between positive history to eggplant and SPT is found to be close to 50%, and that between history of atopy and SPT is 16.7%; these atopic subjects reported experiencing aggravation of their atopic condition following the ingestion of eggplant. The low association could possibly be due to non-IgE-mediated mechanisms or food intolerance mechanisms due to histamine and other components in the eggplant causing non-specific activation.

In spite of high specificity and negative predictive value of SPT to detect eggplant allergy, the sensitivity of SPT to detect eggplant allergy (with both EE and EC) was poor, probably due to the fact that many of the clinical symptoms reported with eggplant may not have been related to type I hypersensitivity. It is apparent from these results that SPT is not a good screening tool to identify eggplant allergy, but would be very useful to rule out eggplant allergy. Alternatively, EE prepared using ultra-filtration to remove molecules <3 kDa (such as histamine and secondary metabolites) would be ideal for SPTs.

In conclusion, this study reveals that eggplant allergy occurs in 0.8% of the population with a female predominance. The gender difference in sensitization to food allergy to eggplant is interesting and a similar trend may be observed for other foods in future. The identification and further characterization of the IgE-binding components in eggplant are being attempted with a view to compare allergens from eggplant with other foods from the Solanaceae family.

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