

Letter to the Editor

Immediate hypersensitivity to mango manifesting as asthma exacerbation

Exacerbação da asma por hipersensibilidade
imediate ao consumo de manga

To the Editor:

Although mango, the national fruit of India, is consumed in large quantities, immediate hypersensitivity reaction to mango is extremely rare. To date, there have been only nine reported cases of immediate hypersensitivity reaction, which has presented, variously, as anaphylaxis, angioedema, erythema, urticaria, and wheezing dyspnea.⁽¹⁻⁸⁾ Delayed hypersensitivity reaction, manifesting as contact dermatitis, can also occur, twelve cases having been reported.⁽⁹⁻¹⁶⁾

The paucity of data regarding allergic manifestations to mango prompted this description of a 46-year-old female patient with immediate hypersensitivity reaction after the ingestion of fresh mango. The patient had nasal symptoms for 4 years which were followed by wheezing dyspnea and cough for 2 years. Her visit to our institute was motivated by specific aggravation of wheezing dyspnea and paroxysmal cough after consumption of ripe mangoes during the current mango season. There was no temporal relationship between her symptoms and the ingestion of any other food items. There was no history of reactions to drugs, including aspirin. Her mother had had asthma since her teens. The nasal mucosa of the patient was erythematous, with mucopurulent secretions on the left side. Bilateral polyphonic expiratory rhonchi were audible over both lungs.

The results of a complete blood workup and chest X-ray were within normal limits. However, a noncontrast CT scan of the paranasal sinuses revealed pansinusitis with left maxillary polyp. Pulmonary function testing showed an FEV₁/FVC ratio of 65%, with an FVC of 2.43 L (87% of predicted) and an FEV₁ of 1.52 L (64% of predicted). This was suggestive of moderate airflow obstruction with no significant reversibility. Prick testing was performed with mango extract from a fresh ripe mango, with a negative control (buffered normal saline) and a positive control (histamine). This elicited a type

I hypersensitivity reaction to the mango extract. Immediate hypersensitivity was confirmed with an intradermal test. The patient declined to undergo skin prick testing with the standard aeroallergens/food allergens. However, she agreed to undergo an open oral food challenge test under observation. Her PEF was recorded before and after eating mango. Immediately after ingestion (within 15 min), she had a bout of coughing, wheezing dyspnea, and throat irritation, with an increase in the intensity of the polyphonic rhonchi. The PEF fell from 4.91 L to 4.42 L, a decrease of 490 mL (9%). This reaction subsided within half an hour after nebulization with albuterol and ipratropium. The patient was subsequently lost to follow up, and we were therefore unable to evaluate the levels of specific IgE antibodies to mango.

Of the nine patients reported to have an immediate hypersensitivity reaction to mango (Table 1), three developed erythema,^(3,4,7) five developed angioedema,^(2,4,6-8) eight developed respiratory distress/dyspnea,⁽¹⁻⁸⁾ and two developed anaphylaxis,^(2,3) which progressed to life threatening anaphylactic shock in one.⁽²⁾ Information regarding the skin test for allergy to mango was available for seven of the nine patients, and the result was positive in all seven.^(2,4,5,6-8) Specific IgE to mango was evaluated in six patients,⁽⁴⁻⁹⁾ but only three patients tested positive.^(5,6,8) It is possible that specific IgE antibodies against mango antigen are not apparent in some patients, because the corresponding allergens might be unstable and remain undetected. The IgE detection system currently available appears to be lacking some of the specific mango allergens, and there is as yet no benchmark for the diagnosis of type I sensitization to mango.

Immediate hypersensitivity reaction is mediated through the classical IgE pathophysiological mechanisms and is thought to occur in previously sensitized individuals.

Table 1 – Data from nine previously published patients with immediate hypersensitivity to mango.

Author/Year/ Country	Age/ Gender	History of atopy	Symptoms after mango ingestion	Time to symptom onset	Treatment received	SPT to mango extract	Cross-reactivity	Symptoms after mango ingestion provocation test	Specific IgE against mango
Kahn/1942/USA ⁽¹⁾	F	Positive	Hoarseness, dyspnea and wheezing	30 min	Inj. epinephrine	NA	NA	Rapidly acute symptoms of hoarseness and wheezing	NA
Rubin & Shapiro/1965/USA ⁽²⁾	32/M	Positive	Itching of eyes, lacrimation, swelling of eyelids, chest tightness, noisy breathing	30 min	Inj. epinephrine and inj. hydrocortisone	Positive passive transfer reaction	Positive to house dust, almond, wheat, watermelon	NA	NA
Dang & Bell/1967/USA ⁽³⁾	24/F	Negative	Gasping for breath, erythema, swelling of face and extremities, hypotension and shock	10 min	Inj. dexamethasone and inj. epinephrine	NA	NA	NA	NA
Miel et al./1988/UK ⁽⁴⁾	32/M	Positive	Periorbital edema, facial erythema, diffuse urticaria, dyspnea	20 min	Inj. epinephrine and inj. hydrocortisone	Positive	NA	NA	Negative by RAST
Duque et al./1999/Spain ⁽⁵⁾	45/F	Positive, latex sensitivity present	Rhino-conjunctivitis, oral allergy, cough, dyspnea	Immediately	Antihistamines and corticosteroids	Positive	NA	NA	Raised by RAST
Hegde/2007/India ⁽⁶⁾	43/F	Negative	Oropharyngeal itching, angioedema of face, respiratory distress	< 10 min	Inj. hydrocortisone and antihistamines	Positive	Positive for Indian dill, cashew apple, <i>Anethum</i> , <i>Anacardium</i>	NA	Positive by ELISA and SDS-PAGE
Renner et al./2008/Germany ⁽⁷⁾	46/F	Positive	Sneezing, rhinorrhea, dyspnea, dysphagia, anxiety	< 10 min	NA	Positive	Positive for ginger and pistachio	NA	Negative
Renner et al./2008/Germany ⁽⁷⁾	24/M	Received immuno-therapy for mugwort sensitization	Urticaria, swelling of face and hands	10 min	NA	Positive	Positive for mugwort, pistachio and ragweed	NA	Negative
Silva et al. 2009/Spain ⁽⁸⁾	39/F	Positive	Facial angioedema, hoarseness, pruritus of palms, respiratory distress	Immediately	Inj. epinephrine and corticosteroids	Positive	Negative	NA	Positive
Current report	46/F	Positive	Wheezing dyspnea, paroxysmal cough, throat irritation	15 min	Nebulization with albuterol and ipratropium	Positive	NA	Immediate bout of coughing, dyspnea, throat irritation. Fall in PEF of 490 mL (90%) 30 min later	NA

NA: not available; RAST: radioallergosorbent test; SPT: skin prick test; and Inj.: injected.

Table 2 – Data from twelve previously published cases of delayed hypersensitivity to mango.

Author/Year/ Country	Age/ Gender	History of atopy	Presenting symptoms after mango ingestion	Time to symptom onset	Resolution of symptoms	Patch testing to mango extract	Cross reactivity
Samuel/1939/USA ⁽⁹⁾	29/F	NA	Itching and vesicular lesions in circumoral region	24 h	NA	NA	NA
Calvert et al./1995/ Australia ⁽¹⁰⁾	21/F	No	Intensely pruritic linear papulo-vesicular lesions on lower legs, urticarial plaques on forearms(contact dermatitis)	4 h	NA	Positive	NA
Calvert et al./1995/ Australia ⁽¹⁰⁾	31/F	No	Intensely pruritic confluent urticaria over arms and abdomen(contact dermatitis)	12 h	NA	Positive	NA
Calvert et al./1995/ Australia ⁽¹⁰⁾	27/F	No	Pruritic confluent urticaria on neck, acute eczematous plaques with bullae on arms(contact dermatitis)	6 days	NA	Positive	NA
Calvert et al./1995/ Australia ⁽¹⁰⁾	36/M	No	Widespread acute eczematous and urticarial plaques(contact dermatitis)	5 h	NA	Positive	NA
Tucker/1998/USA ⁽¹¹⁾	27/M	Sensitivity to poison oak and poison ivy	Pruritic and eczematous rash(contact dermatitis)	7 days	Resolved after a week's treatment with topical steroids	NA	NA
Weinstein et al./2004/ USA ⁽¹²⁾	22/F	No	Patchy pruritic erythema of face, neck and arms with periorbital edema. Papular lesions extended to chest, upper extremities(contact dermatitis)	2 days	S/S subsided after a few days of oral steroids and topical fluocinonide cream	Positive to mango skin, nickel and p-tert butylphenol formaldehyde	NA
Oka et al./2004/ Japan ⁽¹³⁾	NA (2 patients)	No	History of mango dermatitis present(contact dermatitis)	-	-	Positive to mango extract	Positive for urushiol
Wiwankit V/2008/ Thailand ⁽¹⁴⁾	42/F	No	Patchy pruritic erythema of the face, and extremities with periorbital edema(contact dermatitis)	1 day	S/S subsided after 5 days of oral prednisolone and chlorpheniramine	Positive to mango extract	NA
Thoo & Freeman/2008/ Australia ⁽¹⁵⁾	42/F	No	Itchy palpable, pruritic lesions over arms, legs, neck and abdomen (contact dermatitis)	4 days	Prolonged treatment with topical steroids	Positive to mango	NA
Lee et al./2009/ Korea ⁽¹⁶⁾	27/F	No	Eczematous rash and blister formation around lips	NA	NA	Positive to mango	NA

NA: not available; and S/S: signs and symptoms.

Sensitization may occur by prior ingestion or by intake of other fruits belonging to the family *Anacardiaceae*. Canned or packaged mango can also cause an allergic reaction, because the allergenicity of mango nectar persists even after heating, enzymatic degradation, and mechanical tissue damage.

Our patient had episodic breathlessness with wheezing for the preceding two years and had a left nasal polyp. She had no history of an allergic reaction to any drug including aspirin. However, Samter's syndrome could not be ruled out, because the patient was lost to follow-up, and therefore neither skin testing for aspirin sensitivity nor oral challenge with aspirin could be performed.

As can be seen in Table 2, urticaria was present in eight of the twelve reported cases of delayed hypersensitivity reaction to mango,^(9-12,14) whereas periorbital edema was present in two.^(12,14) Three of those twelve patients developed the symptoms after ingesting mango,^(9,12,14) whereas the remaining nine patients developed the reaction after contact with mango skin or the bark of the mango tree.^(10,11,13,15,16) Patch testing was performed in ten patients,^(10,12-16) and the result was positive in all ten. Cross-reactivity and positivity for specific IgE antibodies against mango antigen were not reported in any patient.

Delayed hypersensitivity reaction to mango is cell-mediated and can result from direct contact with the fruit or even with the tree itself. Ingestion can also cause a cell-mediated reaction. The sensitizing substances include urushiol, cardol, limonene and B-pinene which are present in the skin, bark, and pericarp, as well as in the mango pulp, up to five millimeters below the skin.⁽¹⁴⁾

Mango antigen is also known to cross-react with artemisia pollen, birch pollen, poison ivy, mugwort, celery, carrot, pistachio nut, tomato, papaya, and banana.⁽⁸⁾ Latex is known to cross-react with fruits of the *Anacardiaceae* family, to which the mango belongs.⁽⁷⁾ However, none of the patients with documented mango allergy had associated latex hypersensitivity.

Our report highlights the fact that, albeit rare, the mango fruit can cause an immediate hypersensitivity reaction which can result in a life threatening event. It is imperative to recognize such manifestations early in order to avoid morbidity and mortality in susceptible patients.

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