FENUGREEK: AN EMERGENT ALLERGEN

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Introduction

Fenugreek or Trigonella foenum greacum is an ancient medicinal plant native to the eastern Mediterranean; it belongs to Rosaceae order, Leguminosae family, subfamily of Papilonaceae and it is used as a medicinal herb, spice or food.

Fenugreek is a short-lived annual angiosperm plant, 50 cm tall; it has green trifoliate leaves, white or yellow flowers and thin, curved pods containing about 10-20 golden yellow seeds. Its name comes from the triangular shape of its flowers (from Latin "trigonum").

Fenugreek seeds are ground and the powder is used as a condiment or in traditional Ayurvedic and Chinese medicine.

It is used in Indian cuisine as a component of spice mix, such as curry, instead in Egypt it is also used as a supplement in wheat and corn flour for bread-making. Fenugreek appears to have many health benefits and potential medicinal properties (antioxidant, antidiabetic, hepatoprotective, hypocholesterolemic, antimicrobial, anti- inflammatory, neuroprotective, anticarcinogenic, antiulcer, and antilithigenic) both in vitro and in vivo studies (Ouzir et al., 2016; Neelakantan et al., 2014; Yadav et al., 2014; Nagulapalli Venkata et al., 2017).

Fenugreek seed contains: soluble galactomannan, insoluble fiber, proteins, lipids, alkaloids (trigonelline), saponins (based on diosgenin and yamogenin), 4-hydroxyisoleu-cin, volatile oil and C-glycosylflavones of apigenin and luteolin (Yao et al., 2020).

Specifically, it is mainly used to improve digestion, activate metabolism, facilitate delivery, and increase milk flow. Trigonelline appears to be the most active metabolite in fenugreek; it is useful in treating diabetes, reducing cholesterolemia, and treating cancers (liver, breast, cervix, and pancreas) as a phytohormone (Bahmani et al., 2016; Smith et al., 2003).

In addition, fenugreek is used as a cut/crushed seed, herbal preparation, dry extract, soft extract, powder, or in combination with other substances; its main applications are appetite enhancement, topical treatment of localized inflammation of the skin and gut, as an adjuvant in diabetes or hypercholesterolemia.

It is non-toxic up to the maximum dose of 5 g/kg weight. Side effects such as flatulence, diarrhea, abdominal distension, dyspepsia, hypokalemia, increased frequency of urination, and dizziness have been reported.

Among immunologic adverse reactions, the literature reports mainly allergic reactions after contact or ingestion of fenugreek, characterized by urticaria, angioedema, dyspnea, cough, rhinorrhea, and

itching. Type IV or delayed skin reactions following contact with fenugreek preparations are rare but possible. Finally, many authors report the known cross-reactivity between fenugreek and foods belonging to the legume (or Fabaceae) family (European Medicines Agency Assessment Report on Trigonella Foenum-Graecum L., Semen; 2018; Minciullo et al., 2017; Che et al., 2017; Vinje et al., 2012).

Purpose of the study

Given that the use of fenugreek is increasing worldwide, both in diet and nutraceuticals, we can expect an increase in adverse reactions in the coming years.

The purpose of this study is to analyze the medical history of patients who came to our operating unit for suspected adverse reactions after ingestion of fenugreek and to highlight possible cross-reactivity between fenugreek and other legumes or other foods.

Study design

Type of the study

The proposed study is observational, spontaneous, retrospective.

Study location

The study will be carried out at the A.O.U. "G. Martino" of Messina, Operative Unit of Allergy and Clinical Immunology.

Possible benefits

To assess the true incidence of sensitization to fenugreek in the population with clinical history indicative of allergy to spices or nutraceuticals containing this substance, since fenugreek is increasingly used both in food preparation and for therapeutic purposes. The finding of relevant allergenicity of fenugreek could prompt further study of molecular allergens useful for highlighting new patterns of cross-reactivity.

Possible adverse effects

None.

Clinical Case History.

As this is a retrospective study, the clinical case series consists of patients with history suggestive of allergic reaction to foods probably containing fenugreek, who are referred to the Operative Unit of Allergy and Clinical Immunology of the A.O.U. "G. Martino" of Messina on an outpatient visit during the period from January 2022 to December 2023 to perform skin prick tests for foods.

Inclusion criteria.

All patients over the age of 18 years, who came to the outpatient clinic of the Operative Unit of Allergy and Clinical Immunology for suspected allergic reaction after ingestion of spicy foods or intake of phytotherapeutic products containing fenugreek and were prick-by-prick tested with fenugreek, will be included.

Exclusion criteria.

All patients younger than 18 years of age and patients who came to the outpatient clinic of the Operative Unit of Allergy and Clinical Immunology for food allergy skin tests but were not tested for fenugreek because they had an inconclusive history will be excluded.

OTHER INFORMATION

Processing of personal and health data

The personal, clinical and photographic data of the patients involved in the study will be processed in compliance with current regulations on privacy protection, according to the normal procedures already in place in the A.O.U. "G. Martino" of Messina.

In addition, the patients, by means of special forms, duly filled out and signed, have given their consent to the processing of clinical data, including photographic or filmed images related to the health care services being processed anonymously for the purposes of clinical research, epidemiology, training and studies of pathologies.

Costs

No cost burden will be caused by the study to the National Health Service or to the A.O.U. "G. Martino" as no additional or different examinations from normal clinical practice are expected.

Statistical analysis

A descriptive analysis of the demographic and clinical characteristics of the subjects involved in the study will be performed. Categorical variables related to fenugreek-positive subjects and any other co-sensitizing allergens will be expressed as absolute and/or relative frequencies.

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