

## CASE REPORTS

# Occupational rhinoconjunctivitis and asthma by exposure to *Lathyrus sativus* flour

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### ABSTRACT

We report the case of a 42-year-old non-smoking man, who had worked as a carpenter for 6 years and who reported a history of rhinorrhea, paroxysmal sneezing, nasocular pruritus, lacrimation, wheezing and dyspnea attacks while preparing a mixture to seal the junctures between wooden panels.

Allergy study consisted of skin prick testing (SPT) to inhalants, foods and *Lathyrus sativus* flour (LSF) extract, specific bronchial provocation test with LSF extract, cytological analysis of sputum, specific IgE antibodies against LSF, and histamine releasing test with dilutions (1:5, 1:25, 1:125, 1:625) of LSF. The results demonstrated occupational rhinoconjunctivitis and asthma due to LSF exposure.

We provide a review of published reports to date.

**Key words:** Occupational rhinoconjunctivitis and asthma. *Lathyrus sativus*. Vetchling flour. Carpenter.

### INTRODUCTION

The exposure to flours of cereals and legumes by a respiratory way causes occupational asthma in

many workers of the food industry, such as the bakers.

Nevertheless, in recent years other cases of occupational asthma with legumes flours have been described in other sectors, such as oilseed rape flour<sup>1</sup>, lupine seed flour<sup>2</sup> and vetchling flour in the workers of the park industry<sup>3</sup>.

### CASE REPORT

We report the case of a 42 years old man, not smoker, who worked as a carpenter for 6 years and since then he refers a clinical history of rhinorrhea, paroxysmal sneezing, nasocular pruritus, tearing, wheezing and dyspnea attacks, while preparing a mixture with sawdust, vetchling flour and varnish to seal the junctures between the wooden panels. This mixture is elaborated with sawdust, vetchling flour and varnish.

The patient refers improvement out of his working atmosphere and when he worked others activities of his profession.

He had a seasonal rhinoconjunctivitis studied in our department and a positive family history of atopy.

Clinical examination was normal, with well general statement and chest auscultation. Blood cell count and biochemistry values were all normal.

### MATERIAL AND METHODS

*Lathyrus sativus* flour (LSF) extract in a final concentration of 1:10 w/v was obtained following previous reports.

Skin prick testing (SPT) was done with LSF extract as well as a battery of commercially available aller-

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gens including inhalants, woods and cereal flours (wheat, soya, oat, barley, rice and rye); also, cooked legumes (lentils, chick peas and french beans) were testing by prick-by-prick.

Ten atopic and five non-atopic patients were also challenge with 1:10 w/v LSF extract.

Total and specific IgE antibodies against LSF and legumes tested in the skin were determined by CAP assay (Pharmacia Diagnostics A.B, Uppsala, Sweden).

The histamine releasing test (HRT) was performed in total blood with four dilutions (1:5, 1:25, 1:125, 1:625) of LSF; a positive response was defined as major or equal 10 % and considered if the release of anti-IgE was positive.

Specific bronchial provocation test (BPT) with LSF was performed following previous reports, progressive concentrations were tested according to end point titration SPT. Each extract-dose was inhaled during two minutes. Baseline pulmonary function measures of FVC, FEV<sub>1</sub> and FEV<sub>1</sub>/FVC were performed and repeated at 5 and 10 minutes after each challenge of LSF extract.

A positive immediate response was defined as major or equal 20 % fall in FEV<sub>1</sub> in the first hour; hourly peak-flow measurements were performed each two hours for 24 hours, respecting nocturnal rest. A positive late response was defined as a major or equal 35 % fall in peak-flow measurements from the baseline.

Methacholine inhalation was challenged according to the method of Cockcroft<sup>4</sup> 24 hours before and 72 hours later of the specific bronchial provocation test (BPT) with LSF.

Twenty-four hours after specific BPT, a sputum was obtained with hypertonic solution in a gassy statement, that the patient inhaled. This sputum was analyzed.

## RESULTS

SPT with LSF and lentil extracts were positive (LSF: 9x9 mm wheal and 13 25 mm erythema response, lentil: 5 5 mm wheal and 10 10 mm erythema response); the other allergens tested were negative, except platannus pollen(4 4 mm wheal).

Control subjects did not react to LSF extract.

Total IgE was 30 kU/l and specific IgE antibodies against vetchling flour was 0,62 kU/l; negative against the other allergens.

The HRT against LSF was positive with maxim release of 28 % with the concentration 1:625 (fig. 1).

Baseline pulmonary function measures showed normal values (FEV<sub>1</sub>:94,90 %).

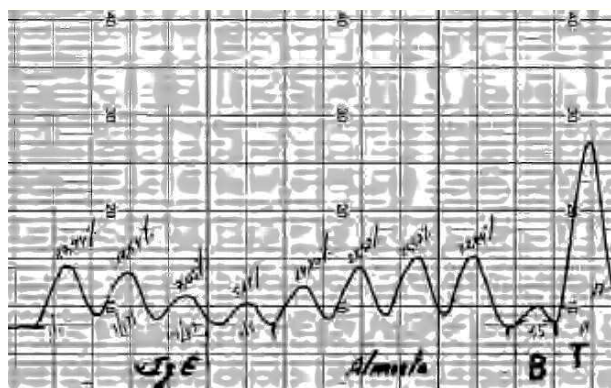


Figure 1.—Histamine releasing test.

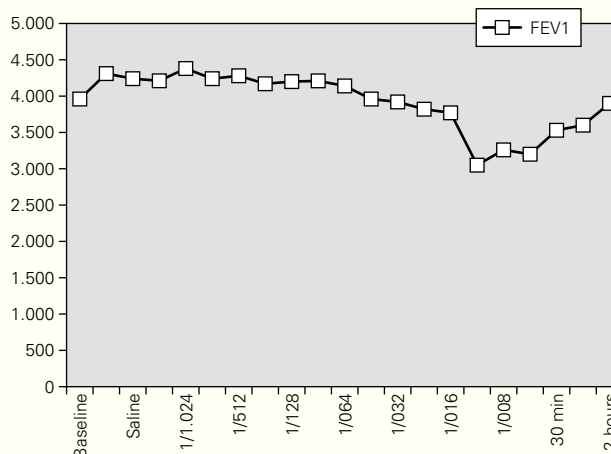


Figure 2.—Specific bronchial provocation with lathyrus sativus flour.

Specific BPT with LSF extract 1:8 v/v got an immediate clinic and pulmonary function positive response at five minutes; FEV<sub>1</sub> decreased 30 % and returned to baseline 30 minutes later with salbutamol inhaled; also the patient referred rhinoconjunctival symptoms and he was asymptomatic two hours later (fig. 2).

Non-specific BPT with methacholine twenty-four hours before specific BPT was negative (PC<sub>20</sub> > 16 mg/ml) but 72 hours after specific BPT revealed a positive response (PC<sub>20</sub>:6,38 mg/ml).

Cytological analysis of induced sputum showed 20 % of eosinophiles and an inflammatory pattern.

## DISCUSSION

Vetchling (*Lathyrus sativus*) is a legume used as flour in cattle feeding and occasionally for human consumption in times of famine or as ingredient of "gachas", typical food of Castilla. The ingestion of

this legume has been associated with lathyrism, although its action mechanism is unknown.

Valdivieso, in 1988, reported the first case of hypersensitivity to LSF<sup>5</sup>; later, a case of a young man who presented gastrointestinal and pulmonary symptoms after eating and inhaling LSF was reviewed and they demonstrated cross-reactivity to other members of the legume family, as lentils or french beans, by reverse enzyme immuno-assay was reported<sup>6</sup>.

In 1995, Sainza reported two young women with symptoms after eating LSF; these patients referred previously hypersensitivity to other legumes<sup>7</sup>.

The allergenic composition of vetchling has been studied; the most allergens of LSF are thermostable, as in other legumes, although, it was corroborated the cross-reactivity with other legumes of the same family<sup>8</sup>.

We reported a case of occupational rhinoconjunctivitis and asthma by exposure to *Lathyrus sativus* flour with specific BPT positive and in vitro study with specific IgE determination, cytological analysis of induced sputum and histamine release test positive.

Occupational asthma by exposure to cereal flours is a well-known disease in bakery's industry and it is used as model of study.

However exposure to flours could be occurs in other type of works where they are used. In this case the exposure was occupational in wood industries.

Recently a similar case has been published for our group<sup>9</sup>; this situation point out the risk of allergy to flours in these workers.

In the cases of occupational asthma by flour, the patients tolerate the cooked food; our patient toler-

ated legumes without problems, but he didn't have eaten foodstuffs prepared with this flour.

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