

Rhinitis and nasal continuous positive air pressure?

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Key words: air temperature; nasal continuous positive air pressure; nasal peak inspiratory flow; obstructive sleep apnea; rhinitis; rhinomanometry.

● NASAL continuous positive airway pressure (nCPAP) is the first-line therapy for obstructive sleep apnea syndrome (OSAS), a highly prevalent disorder associated with significant morbidity and mortality rate (1).

Resolved with "natural warming" of nCPAP circuit.

Patients with OSAS have inflammation of the upper respiratory tract (2), and nasal obstruction is commonly reported as a potential risk factor for the disease. In fact, patients with allergic rhinitis have a 1.8 higher risk of OSAS (3), and patients with seasonal allergic rhinitis have more sleep apnea during the pollen season (4). On the other hand, nasal blocking is one of the most frequent side-effects in the initial phase of nCPAP therapy (5).

We report a case of late-onset rhinitis after nCPAP therapy for OSAS.

A 56-year-old woman, treated for secondary hypothyroidism (after partial thyroidectomy due to multinodular goiter), was evaluated for suspected OSAS. She had marked daytime somnolence, with an Epworth score of 22 (normal less than 10, maximum 24). Her physical examination was unremarkable; she presented normal lung function but had resting hypoxemia (PaO_2 66.4 mmHg). Routine blood analyses were normal, and thyroid function was evaluated ever 5–6 months, remaining within normal range throughout our observations. Diagnostic polysomnography showed marked sleep fragmentation due to frequent bouts of obstructive apnea and

hypopnea (apnea/hypopnea index: 50), establishing the diagnosis of severe OSAS. Home nCPAP (Aria, Respironics, Monroeville, PA, USA) was then started at 8 cmH₂O. She initially had good compliance with treatment, with no side-effects and significant symptomatic improvement was noted (Epworth score of 8 and PaO_2 of 86 mmHg).

After 6 months of treatment (October 1998), she began to have severe nasal symptoms: mucous rhinorrhea, sneezing, frontal headaches, and nasal obstruction. These symptoms were related to her use of the nasal mask and improved with the voluntary interruption of nCPAP. This noncompliance made OSAS symptoms recur (Epworth score of 20). There was no previous history of rhinitis or sinusitis, and no signs of infection were detected. Skin prick tests to common allergens and latex (four different commercial extracts) were negative. Total serum IgE, specific latex IgE, and an upper airway CT scan were normal.

Nasal peak inspiratory flow (nPIF) (In-Check, Clement Clarke, Harlow, UK) was evaluated seven times daily before and after trying to restart nCPAP. The minimum daily value fell from 180 to 70 l/s, and nasal symptoms reappeared (rhinorrhea and local pain). Due to worsening OSAS symptoms, she agreed to another nCPAP "challenge", monitoring of the nasal symptoms score (NSS) and nPIF, analysis of nasal lavage, and active anterior rhinomanometry (Hortmann, Rhinomodul, Germany) before and after 7 days of use. Compliance with treatment (i.e., number of hours of effective treatment) was automatically recorded by Aria CPAP.

These tests showed an increase of the symptoms score from 0 to 8.7, a fall in nPIF, and a decrease in nasal flow on nCPAP therapy (total expiratory airflow fell from 1059 to 769 ccm/s). Absence of inflammatory cells in nasal lavage was observed on both occasions.

Several therapeutic approaches were unsuccessful; these included changing the nasal mask and several medications (oral antihistamines, local and oral vasoconstrictors, nasal ipatropium bromide, and topical steroids).

The influence of the air temperature was thought to be a possible cause of the symptoms, and "natural warming" of the nCPAP circuit was tried by placing it under bedclothes. This simple measure achieved complete resolution of nasal complaints (mean NSS: 1.3), with stabilization of nPIF recordings around 110 l/s, and a gain in nCPAP compliance (average hours of use: 6.3) with improved OSAS symptoms (Epworth score 3).

Our case shows that a detailed investigation of nasal symptoms during nCPAP can eliminate this side-effect and improve compliance with nCPAP in OSAS. Serial nPIF monitoring is a useful tool for the objective evaluation of nasal complaints in patients undergoing nCPAP.

Although the mechanisms involved in the nonallergic rhinitis reflex to nCPAP in this patient are not fully elucidated, the beneficial effect of air warming suggests that the temperature of the inspired air has a role. This simple, inexpensive approach challenges recent reports recommending the use of heated humidifiers (a costly solution) to resolve nasal symptoms of patients undergoing CPAP (6).

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Occupational allergy to papain

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Key words: cosmeticians; occupational allergy; papain.

● PAPAINE, a proteolytic enzyme extracted from the latex of the papaya tree and fruit (*Carica papaya*), has numerous uses and applications (meat and cephalopod tenderizer, beer clarificant, pharmaceuticals, cosmetics, etc.). It is well known that papain can induce IgE allergy reactions through different routes: respiratory, contact, or digestive (1–3). Most of them involve cases of occupational rhinitis and asthma in workers of industries where papain is handled. We report two new cases of occupational allergy to papain in two beauty workers.

Two nonatopic cosmeticians with IgE-mediated allergy.

Patient 1 was a 22-year-old woman who had worked in a beauty salon for 5 years. Progressively, she developed contact urticaria, rhinoconjunctivitis, and asthma when she used papain tablets dissolved in water for removing adhesives; therefore, she had stopped using them several weeks before she consulted the allergist. She did not suffer these symptoms in other situations, but only slight nose blockage and sneezes when she handled detergents. She never ate papaya and she never had any problems with fruits such as pineapple or kiwi, meat, or beer. She did not have symptoms with latex and toothpaste either. She did not wear contact lenses.

Patient 2 was a 31-year-old woman who had worked in a beauty salon for 10 years. She suffered rhinitis, asthma, and contact urticaria when she used papain tablets for removing adhesives; therefore, she had stopped using them several years before she consulted the allergist. She did not have symptoms in other situations. She never ate papaya and never had any problems with meat or pineapple, but she suffered mouth itching after eating kiwi. She did not drink beer. She wore contact lenses without problems, and she tolerated contact with latex and toothpaste.

In patient 1, the prick tests with 5% papain in PBS extract obtained from the tablet and commercial extract of papain (LETI, Barcelona, Spain) were positive with wheal sizes of 15×5 mm and 4×4 mm, respectively; prick by prick with papaya was 6×6 mm. The results of the skin tests with bromelain, pineapple, kiwi, and latex (LETI) and common inhalants (ALK-Abelló, Madrid, Spain) were negative. Total IgE (CAP System, Pharmacia, Sweden) was 194 kU/l; specific IgE (CAP System) against papain was 47.3 kU/l, and it was 8.37 kU/l to papaya. Specific IgE to latex, kiwi, bromelain, and pineapple were not found. Specific IgE immunoblotting, performed according to Moneo et al. (4), showed a

strong band between 24 and 50 kDa when the extract of papain was analyzed; bands were not found for kiwi, *Ficus benjamina* latex, and fig extracts.

In patient 2, the skin prick test with commercial papain showed a wheal size of 6×5 mm, and prick by prick with papaya showed 3×2 mm (the test with papain tablet extract was not done). Skin prick tests with common inhalants, bromelain, pineapple, and latex were negative; that with kiwi resulted in a wheal of 2×2 mm. Total IgE was 48.4 kU/l.

Specific IgE to papain was 19.5 kU/l; to papaya, 4.95 kU/l; and to kiwi, 0.52 kU/l. Results for latex, bromelain, and pineapple were negative. The immunoblot demonstrated a strong band between 34 and 50 kDa and a weaker one at 24 kDa. At this value, only one band was found to kiwi extract, and none were found to *F. benjamina* latex and fig extracts.

We present two new cases of occupational type I allergic reactions to papain demonstrated by skin and sera tests. The sensitization was produced in a different workplace from those usually reported, such as the drug and food industries. We found only one reference on papain allergy in cosmeticians (5), perhaps because the patients clearly perceive the symptoms from using this substance, avoid it, and never consult an allergist for this problem. Cross-reactivity between papain and fruits, bromelain, latex, and *F. benjamina* latex has been reported (6, 7). In our patients, this was not found, but in patient 2 a similar band at 24 kDa in blotting with papain and kiwi extracts was found.

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