An Unusual Case of Occupational Rhinitis

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Allergic rhinitis, when not related to proteic allergens, is difficult to diagnose. We report a case in which no association with a high-molecular-weight allergen was identified.

A 35-year-old man reported rhinitis, anosmia, and epistaxis with no bronchial or cutaneous signs that had first appeared some months previously. Symptoms seemed to be associated with the patient's occupation, since they disappeared for a few days during vacations and recurred within a few days after returning to work. He also reported exacerbations 4 to 5 hours after consuming wine.

The patient had been working for many years in a coffee factory making coffee pods without wearing masks or protective gloves and was regularly exposed to coffee dust and paper filter systems, which included sulfur dioxide (SO_2) and sulphites (SO_3) at concentrations below regulatory standards.

Examination of his ears, nose, and throat only revealed nonspecific inflammatory rhinitis. No septal deviation, tumors, or signs of acute or chronic sinonasal disease (eg, secretions, crusts, and polyps) were identified. Lung function tests revealed normal spirometry findings without reversibility. No atopic conditions and no history of previous respiratory disease were found.

Immediate skin prick test readings were negative for coffee, coffee pods, and sodium metabisulphite (SMBS). However, prick tests with SMBS were positive a few hours later and were accompanied by a burning and itching sensation and infiltrating erythema.

Patch tests with SMBS (1% pet) were positive (++) at 24 hours (Figure). An "as is" SMBS control was negative at 30 minutes.

A nasal provocation test with a moistened fiber decoction was positive (immediate epistaxis and rhinorrhea).

An oral provocation test with sulfites (up to a cummulative dose of 680 mg) triggered nasal pruritus, rhinorrhea, and an 11% drop in FEV_1 (ie, 500 mL) at the end of the test (after 6 hours). Consequently, the result was considered positive, although the patient recovered spontaneously without treatment.

Green coffee IgE was <0.1 kU_A/L (Thermo Fisher Scientific).

The patient was then moved to another area of the factory and assigned other duties. His occupational symptoms subsequently disappeared.

Figure. Positive patch test reading for sodium metabisulfite (++) at 24 hours.

Our skin test results may lead to discussion because of positive results in patch tests. This apparent mismatch between clinical symptoms (rhinitis due to SMBS, which typically indicates an IgE-mediated response or irritation caused by the chemical SO_2) and patch test results (showing infiltrated erythema in nonimmediate readings) has already been described for ammonium persulphate [1] and for 2-chloracetaphenone [2]. Consequently, the same allergic mechanism could be involved in allergic contact dermatitis induced by low- and high-molecular-weight molecules. Very low exposure may explain the lack of cutaneous signs, whereas exposure via the nasal mucosa, where molecules are better absorbed, revealed the disease. Associations between allergic contact dermatitis and respiratory signs have also been reported [3]. One case involved combined skin and respiratory symptoms in a 26-year-old man working as a site foreman, whose reaction mimicked atopic disease after airborne occupational exposure to the biocides methylisothiazolinone and methylchloroisothiazolinone. The symptoms began with respiratory signs (dry cough and rhinitis), followed by an eczematous rash a few days later. Patch tests with the European baseline battery were positive for methylisothiazolinone (2000 ppm aq) and methylchloroisothiazolinone (200 ppm aq). Prick tests also carried out with aqueous solutions of patch test preparations of methylisothiazolinone were negative. In another case, a 24-year-old female hairdresser experienced episodes of rhinitis, dyspnea, and cough 1 hour after exposure to bleaching powder. Patch test results were positive to ammonium persulfate after 48 and 72 hours. Conversely, prick tests with bleaching powder and ammonium persulfate preparation were negative.

Our results are limited by the absence of a control group; however, we considered that epistaxis resulted from

inflammation and not from irritation or other causes. There were no other symptoms to evoke possible causes of epistaxis, eg, unilateral nasal blockage, facial pain, headaches, facial swelling/deformity, South-East Asian origin (nasopharyngeal carcinoma), loose teeth, or otalgia (according to an update on epistaxis [4]). Furthermore, in the present case, the olfactory dysfunction may be the result of upper respiratory inflammation and nasal obstruction. There was no cranial trauma or associated signs.

Our findings could support the use of nonimmediate patch test readings (along with immediate readings of skin prick tests) in cases of occupational rhinitis involving airborne particles, which may underlie T cell–mediated hypersensitivity reactions, as previously suggested [5].

Nonimmediate patch test readings could prove useful in cases were T cell–mediated hypersensitivity reactions are believed to be caused by airborne particules such as sulfites.

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Conflicts of Interest

Dr. Demoly reports personal fees from ALK, Stallergenes Greer, IQVIA, Chiesi, AstraZeneca, Thermo Fisher Scientific, Ménarini, Bausch & Lomb, Mylan, ASIT Biotech, Novartis, Sanofi, and Regeneron outside the submitted work. The remaining authors declare that they have no conflicts of interest.

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