Occupational allergic rhinoconjunctivitis to *Tachypleus* amoebocyte lysate: a case report

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To the Editor: Horseshoes crab is an ancient ocean creature, belonging to Arthropoda. There are three genera, *Limulus*, *Tachypleus*, and *Carcinoscorpius*.^[1] Amoebocyte lysate is a lyophilized product extracted from amoebocyte of horseshoes crab and known as *Limulus* amoebocyte lysate (LAL) and *Tachypleus* amoebocyte lysate (TAL), which is widely used in endotoxin detection. As a result of occupational exposure, people working with endotoxin assessments have a risk of LAL or TAL allergy. Herein we describe a case of occupational allergy to TAL.

A 32-year-old female technician complained of recurrent nasal itching and congestion, sneezing, clear rhinorrhea and itchy eyes for 6 months. The symptoms would sudden onset within several minutes after preparing TAL solution. She had been worked with TAL to detect endotoxin in a pharmacy laboratory since 2006.

She was provisionally diagnosed with TAL-induced allergic rhinoconjunctivitis. To confirm it, skin prick test (SPT) was performed with TAL (0.25 EU: 0.1 mL/ampules; Xiamen Bioendo Technology Co. Ltd., China). The response was positive (wheal 19 mm × 11 mm, flush 47 mm × 78 mm). Late reaction was not observed. One non-atopic control yielded a negative response to TAL [Figure 1A].

Respiratory reactions to TAL were measured via realistic and nasal provocation testing (NPT). Dissolving six ampules of TAL in clinic room was utilized as the challenge. Nasal ventilation and pulmonary function were measured at baseline, 30 min and 4 h after the provocation. The patient developed rhinoconjunctivitis symptoms at the 6th min after the challenge. Compared with baseline, her nasal resistance exhibited a 97% increase after 30 min. There was no substantial difference in nasal resistance after 4 h and pulmonary function. NPT with TAL was performed in another day and the patient was asymptomatic before NPT.

Small pieces of filter paper were impregnated with 30 µL TAL solution and applied to the inferior turbinate. The patient developed itchy nose immediately, then heavy rhinorrhea and other rhinoconjunctivitis symptoms within 5 min. According to Total Nasal Symptom Scores, she was positive to NPT (seven points: rhinorrhea two, nasal obstruction two, sneezing one, nasal itchy two).^[2] Nasal resistance failed to measure due to the intense nasal symptoms. No allergic or other abnormal manifestation was observed in the control.

In immunoblotting, a 20,000 and a 185,000 Da band of TAL were recognized by the patient's sera [Figure 1B], whereas no immunoreactive bands were detected in the control's sera.

Thus, TAL-induced occupational rhinoconjunctivitis were diagnosed. We suggested her to strictly avoid contact with TAL. Otherwise, she would better to use a biosafety cabinet and wear a protective mask when preparing TAL.

During the follow-up, the patient has seldom developed rhinoconjunctivitis at work after taking protective measures.

The case present here was occupational allergic rhinoconjunctivitis owing to TAL, diagnosed by SPT, provocation test and serological experiment. A 20,000 and a 185,000 Da immunoglobulin E-reacting band were demonstrated as candidate allergens in TAL. A similar report described a laboratory technician with rhinoconjunctivitis and periorbital swelling caused by LAL in 1992.^[3]

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given

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Figure 1: The skin prick test of the patient and immunoblotting findings of the patient's sera. (A) Skin prick test. (B) *Tachypleus* amoebocyte lysate (TAL) sodium dodecyl sulfate-polyacrylamide gel electrophoresis and IgE immunoblotting. C: Healthy control; IgE: Immunoglobulin E; NC: Negative control; P: Patient; PC: Positive control.

her consent for her images and other clinical information to be reported in the article. The patient understands that her name and initial will not be published and due efforts will be made to conceal the identity of the patient, although anonymity cannot be guaranteed.

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Conflicts of interest

None.

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