

Case report

A non-infectious airborne disease

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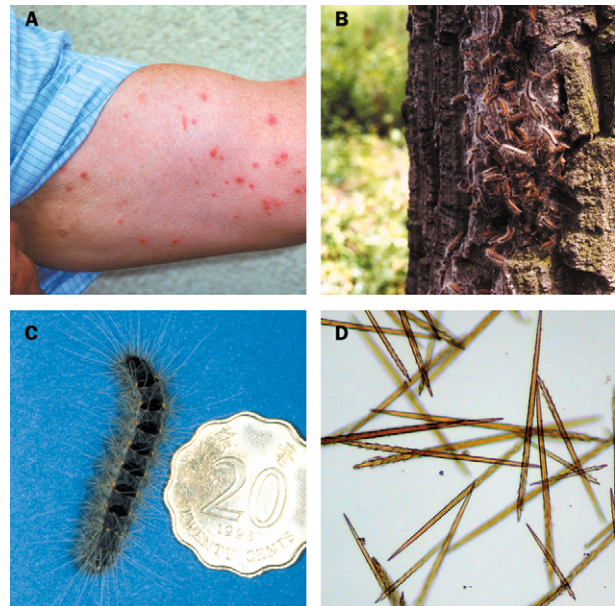
A 60-year-old man presented in June, 2000, complaining of an itchy rash, malaise, loss of appetite and nausea. The previous day, while walking in his garden, he developed itching on his forearms, ankles and neck. The pruritus was followed within 2 h by weals, which rapidly evolved into papules and pustules (figure, A). He was a well-known opera singer with a 19-year history of chronic obstructive pulmonary disease for which he was taking salbutamol, theophylline, formoterol fumarat, and beclomethasone. He complained that he had difficulty singing, and told his general practitioner that 10 days previously he had seen thousands of caterpillars moving along the branches of an old oak tree in his garden. Although he initially saw no connection between the caterpillars and his physical condition, later, whenever he opened the window or went into the garden, the pruritus and dyspnoea worsened.

We went to his house to investigate and found thousands of *Thaumetopoea processionea* larvae in the oak tree (figure, B, C). *T processionea* are a species of Lepidoptera, known as the oak processionary caterpillar, which move, as their name implies, head to tail, from their nests during the night to the top of the tree, where they feed on foliage. Lepidopterism refers to pathological conditions caused by contact with poisonous moths or the larvae of lepidopterans.¹ Owing to his history of COPD our patient proved to be particularly susceptible to respiratory distress, and we treated him with topical steroids, parenteral antihistamines and increased use of a β_2 agonist. We visited his house again, later in the week, to collect larvae for research. At one point, when a nest fell from the tree and we were putting it into a container, the patient, who was standing 8 metres away, suffered severe bronchoconstriction with rapid onset of dyspnoea, tachypnoea, cough, and wheeze. He had to sit down, lean forward, and use accessory muscles for respiration. We gave him intravenous theophylline, and his symptoms resolved within 15 min. Avoidance of re-exposure is difficult to achieve because setae and larval exuviae of lepidoterans are spread by the wind. Our patient was unusually prone to re-exposure, as the state-protected infested oak stood close to his living-room window, as it had done when Sigmund Freud came to stay in the house in 1931.⁵ In the summers of 2001, and 2002, our patient

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Lepidopterism

Toxic irritative caterpillar dermatitis (A), silken nest on the trunk of an infested oak tree with living larvae (B), sixth larval instar of *T processionea* L. (C), setae ($\times 200$, D).

again developed dermatitis and dyspnoea, but in 2003, the caterpillars did not reappear.

Poisonous lepidopterans are endemic in many countries,² and 150 species of Lepidoptera worldwide may prove harmful to humans. *T processionea* does not develop poisonous hairs (setae; figure, D) before the 3rd growth phase (instar), which may explain why our patient did not experience any ill effects when he first saw the caterpillars. The setae contain the histamine-liberating protein thaumetopoein or a closely-related compound. Allergic reactions can be caused by direct contact with this noxious arthropod, as when children handle or eat caterpillars, but also by airborne setae, which are not noticed by passers by. The setae can cause a foreign body reaction, non-IgE-mediated mediator release by thaumetopoein, or type I hypersensitivity reactions in skin and mucous membranes.^{2,3} Cutaneous manifestations are common, usually following airborne spread,⁴ but ocular, oropharyngeal, gastrointestinal, respiratory, and systemic reactions, including anaphylactic shock, also occur. Large areas of the woodlands surrounding Vienna have long been infested by *T processionea*. The location of an infested oak tree in a residential area, on which the caterpillars were clearly visible, allowed us to identify this airborne disease as a case of lepidopterism. Lepidopterism is not often diagnosed;⁴ doctors need to consider this cause of hypersensitivity in the appropriate setting, and collaborate with forest authorities to minimise human exposure.

References

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