

## Tea-dust induced asthma

J.A. Roberts\*, N.C. Thomson\*\*

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**ABSTRACT:** A 55-yr old female worker in a tea-packing production line developed asthma to tea-dust. She had no previous history of chest disease, and skin prick testing to a solution of tea-dust and to a variety of common allergens were all negative. Diagnosis was established by serial peak expiratory flow rate readings. Bronchial provocation challenge with tea-dust demonstrated a late asthmatic reaction.

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\* Department of Medicine, Southampton General Hospital, Southampton, England.

\*\* Department of Respiratory Medicine, Western Infirmary, Glasgow, Scotland.

Correspondence: Dr. J.A. Roberts, Department of Medicine, D Level, East Wing, Southampton General Hospital, Tremona Road, Southampton, SO9 4XY, England.

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Work-related asthma to a variety of organic dusts has been reported previously [1]. We report a patient who worked as a tea-packer and who developed asthma related to tea-dust exposure.

### Report

The patient was a 55-yr old lady who had worked as a tea-packer for more than 10 yrs. In 1982 she developed symptoms of increased cough and sputum, nasal discharge, sore throat, chest tightness, weakness and lethargy. The development of these symptoms coincided with a change in the source of the tea packed. The atmosphere of the factory was "laden with tea-dust". Her symptoms improved during holidays, but persisted over weekends.

During her first attendance at the respiratory unit it was found that the patient had smoked ten cigarettes per day for the previous 25 yrs, but she stopped in

response to medical advice. There was no personal or familial history of atopic disease. Skin testing against house dust, *Dermatophagoides pteronissinus*, cat fur, dog dander, mixed feathers, grass pollen and *Aspergillus fumigatus* were negative. Pulmonary function test results (predicted values in brackets) were as follows: forced expiratory volume in one second (FEV<sub>1</sub>) 2.8 (2.4) l, forced vital capacity (FVC) 3.5 (3.2) l, FEV<sub>1</sub>/FVC% 82%, residual volume (RV) 1.7 (1.8) l, total lung capacity (TLC) 5.2 (5.0) l, transfer factor of lungs for carbon monoxide (TLco) 7.6 (7.8) mmol·mm<sup>-1</sup>·kPa<sup>-1</sup>.

The patient recorded the best of three peak expiratory flow rate (PEFR) measurements four times a day using a Wright's portable peak flow meter. PEFR measurements showed no clear trend when recorded during the normal five day working week, but when recorded over a nine day holiday period PEFR increased, and then deteriorated when work was recommenced (fig. 1). This fall coincided with a return of

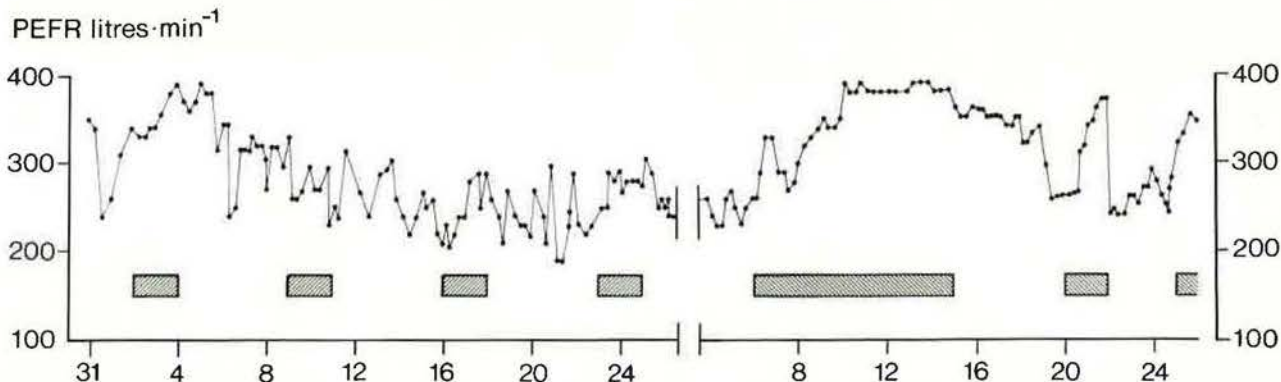


Fig. 1. - Graph of peak expiratory flow rate (PEFR) against time. Hatched areas indicate periods away from occupation (weekends and holidays).

symptoms.

A bronchial provocation challenge was performed in the pulmonary function laboratory using tea-dust obtained from her workplace. The patient transferred

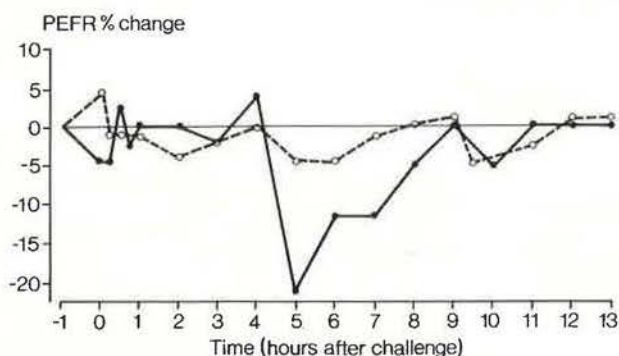


Fig. 2. — Graph of percentage change in PEFR against time in hours following tea-dust (●—●) and placebo (○—○) challenge.

the tea-dust between two containers for one hour. PEFR was measured before challenge and then for 13 h after challenge; initially every 15 min for the first hour and then hourly. On a control day PEFR was recorded in a similar manner but without exposure to tea-dust.

There was no early reaction, but a late fall in PEFR occurred 5 h after the challenge (fig. 2). Skin prick testing against a solution of tea-dust dissolved in alcohol and then suspended in distilled water was negative.

### Discussion

Diagnosis was established through the variation in PEFR recordings which related to exposure to tea-dust at work. The patient described development of symptoms including wheeze following exposure to tea-dust at work. Challenge with this tea-dust produced a late asthmatic reaction with no early reaction. Skin testing was unhelpful, but this is not surprising as the lack of early response would suggest that an IgE mediated type I allergic reaction was not a major feature of this patient's asthma.

This case illustrates some of the problems of diagnosing occupational asthma. The slow recovery of lung function (fig. 1) meant that weekend breaks did

not produce significant improvement in lung function and a longer break from exposure was necessary to allow improvement to occur. This problem has been described by BURGE [2] who stated that it may be necessary to measure PEFR "during prolonged periods off work". Challenge testing did not produce an immediate asthmatic response. An 8 h follow-up was necessary to demonstrate a significant late asthmatic reaction. This challenge test was undertaken after a two week period of holiday from the workplace.

There are few reports in the literature of cases of asthma produced by exposure to tea-dust. An early asthmatic response to tea-dust has been described previously [3] in a tea-maker in Ceylon. In this patient there was a positive skin prick test to tea fluff antigen and a marked early response, but no mention was made of a late response. CARTIER *et al.* [4] reported, in abstract form, two cases of asthma induced by exposure to tea-dust. One was atopic and developed a late reaction in response to challenge with tea-dust. The second had no change in spirometry, but developed increased airway responsiveness following exposure to tea-dust. Although there are many reports of organic dusts producing asthma in susceptible workers [1], we are unaware of any other reports of tea-dust being the causal agent. Tea-dust should, therefore, be added to the list of substances known to produce occupational asthma.

### References

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RÉSUMÉ: Une ouvrière de 55 ans, dans la ligne de production d'emballage de thé, a développé de l'asthme sur poussière de thé. Elle n'avait pas d'antécédent de maladie respiratoire, et les tests cutanés avec une solution de poussière de thé et d'une série d'allergènes communs ont été tous négatifs. Le diagnostic a été établi par des mesures répétitives du débit expiratoire de pointe. Un test de provocation bronchique à la poussière de thé a démontré une réaction asthmatique retardée.