

47 mg/dl (10–40), albumin with 56.3% (60.6–68.6) and γ -globulins with 21% (12.1–17.7). Thyroid-stimulating hormone (TSH) was increased with 4.2 mU/l (0.1–4.0); FT4 and FT3 were normal, but hTg (110 U/ml) and thyroid peroxidase (TPO) (4355 U/ml) antibodies were positive. IgG and C3c circulating immune complexes were increased, with normal IgA and IgM immune complexes. Normal or negative were complete blood count (CBC), C-reactive protein (CRP), C3, anti-nuclear antibodies (ANA), anti-neutrophil cytoplasmic antibodies (ANCA), hepatitis serology and glucose-6-phosphate-dehydrogenase (G-6-PDH). The anti-streptolysin titre was elevated; the patient, however, showed no clinical signs of infection. Urine analysis revealed a microhaematuria and proteinuria, but 24 h urine protein was normal. Chest X-ray and abdominal echography were without pathological findings.

We performed an autologous serum skin test (ASST; Greaves test) (2), which was positive; saline showed no reaction (Fig. 1B). A biopsy of a wheal showed features of leucocytoclastic vasculitis (Fig. 1C). The ASST remained over 0.8 cm in size over 2 days. Biopsy revealed a leucocytoclastic vasculitis (Fig. 1D).

Based on the clinical and the laboratory findings, the diagnosis of UV associated with PA and Hashimoto's thyroiditis (HT) was made. We started a therapy with levocetirizine 5 mg/day, rofecoxib 25 mg/day, montelukast 10 mg/day, levothyroxine 50 μ g/day and selenium 50 μ g b.i.d. Over a period of 4 weeks our patient responded partially to this treatment. We replaced rofecoxib and montelukast by chloroquine 250 mg/day and after 2 weeks of treatment our patient was completely free of symptoms. After 2 months, chloroquine was given as monotherapy and after a follow-up examination after 6 months, the patient was still asymptomatic. The treatment was well tolerated.

Although frequently associated with autoimmune diseases, this is the first reported case of UV associated with PA and HT. A case of chronic angioedema of the tongue associated with PA and HT was previously published (3).

Histamine-releasing anti-FcepsilonRIalpha autoantibodies, which are associated with positive skin test responses to autologous sera in patients with chronic idiopathic urticaria (4), have been reported in one patient with UV (5). The ASST has a sensitivity of approximately 70% and a specificity of 80% for detection of patients with autoimmune urticaria (2). Although *in vitro* tests seem less sensitive than ASST in the detection of patients with histamine-releasing factors in the blood (6), to our knowledge there are no published cases of positive ASST in UV.

The findings of a positive ASST with clinical and histological findings of vasculitis have previously not been described. Its occurrence along with circulating immune complexes of IgG and C3c make a pathogenetical role of circulating immune complexes in this patient highly possible. The ASST might be a useful adjunctive test in detecting the underlying pathophysiology in UV; further investigations in this interesting field are required.

*Department of Dermatology and Allergy
Technische Universität München
Biedersteiner Str. 29
D-80802 Munich
Germany
Tel: +49 89 4140 3550
Fax +49 89 4140 3552
E-mail: ollert@lrz.tum.de

Accepted for publication 23 July 2006
Allergy 2006; 61:1484–1485
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Munksgaard
DOI: 10.1111/j.1398-9995.2006.01231.x

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Occupational asthma and allergy to sevoflurane and isoflurane in anaesthetic staff

A. D. Vellore*, V. J. Drought, D. Sherwood-Jones, B. Tunnicliffe, V. C. Moore, A. S. Robertson, P. S. Burge

Keywords: bronchial provocation; isoflurane; OASYS; occupational asthma; sevoflurane

Isoflurane has caused contact dermatitis in an anaesthetist (1), and dermatitis is common in anaesthetic workers (2). However, there are no prior reports of occupational asthma.

We report three cases with occupational asthma, work-related angioedema or dermatitis to *isoflurane* (1-chloro-2,2,2-trifluoroethyl difluoromethyl ether) and *sevoflurane* [fluoromethyl 2,2,2-trifluoro-1-(trifluoromethyl) ethyl ether] with positive specific bronchial provocation testing. All worked as anaesthetic assistants or nurses in the same hospital.

Bronchial provocation testing: Sequentially increasing exposures to sevoflurane and isoflurane were delivered on separate days via mask attached to an

The first report of occupational asthma and rhinitis from isoflurane and sevoflurane in anaesthetic staff.

air driven anaesthetic machine delivering isoflurane or sevoflurane. Sequential exposures of three (0.25%), five (0.25%) and 7–10 breaths (0.37–0.5%) were given after 10 min intervals, provided that the forced expiratory volume 1 (FEV₁) was within 15% of baseline. On separate days indirect exposures were made allowing 1 ml of 100% sevoflurane or isoflurane to evaporate in a 6 m (3) challenge chamber over 1 h. Post-challenge FEV₁ was monitored for 12 h. A drop in FEV₁ of 15% over control (Shield cleaner used at work) was considered significant. Methacholine reactivity was measured by the Yan method (normal > 2000 µg).

Case 1: Work-related breathlessness, wheeze, chest tightness, rhinitis and eye irritation developed after a latent interval of 4 years of using isoflurane and sevoflurane. Her breathlessness would start within minutes of entering the operating theatres, worsen during her shift and improve after leaving work, then waking her 2–3 times from sleep. Symptoms improved during days away from work and on holidays. She had four previous general anaesthetics without incident. Analysis of two hourly peak flow records using the OASYS-2 [computer software program that uses discriminant analysis to compute a score between 1 and 4 indicating the likelihood of a Peak Expiratory Flow record showing an occupational effect (3)] showed clear evidence of occupational asthma (OASYS-2 score = 4). Figure 1 shows a 32% late asthmatic reaction following 15 breaths of isoflurane. Sevoflurane 18 breaths resulted in

a 16% FEV₁ fall from baseline at 10 h (control 11%); Methacholine PD₂₀ developed from >4800 to 2127 µg postisoflurane challenge. She subsequently had an anaphylactic reaction to sevoflurane during general anaesthesia. Occupational asthma resolved following relocation to a psychiatric unit where only intravenous anaesthetics were used for electroconvulsive therapy). She has later retired on medical grounds.

Case 2: She developed wheeze and breathlessness 17 years after first starting work using isoflurane and sevoflurane in operating theatres. Serial peak flows showed only very small work related changes (OASYS score 2.17). Challenge testing to 18 breaths was negative for sevoflurane and equivocal for isoflurane (15% fall at 8 h) but indirect exposure to sevoflurane resulted in a 14% late asthmatic reaction with a significant change in Methacholine PD₂₀ from 2400 to 900 µg. Relocation to the coronary care unit abolished her work-related symptoms.

Case 3: She developed skin rash and facial swelling 3 years after starting theatre work, often accompanied by chest tightness. There was no change in FEV₁ following any challenge but exposure to isoflurane was followed by an itchy rash after both direct and indirect methods. Methacholine reactivity increased from >4800 to 1745 µg. She remains well after relocation to preoperative assessment.

Sevoflurane and isoflurane are recommended for inhalational anaesthesia in patients with a history of

asthma due to their bronchodilating properties (4, 5). The department from which all three workers came carried out a high number of gas inductions, particularly in children. Scavenging during operations was in place, but difficult to achieve during gas induction, and was not attempted when the anaesthetic gases were being exhaled by patients during recovery. The subsequent anaphylactic reaction following sevoflurane anaesthesia in the first worker, despite an equivocal challenge, suggests that larger doses during BPT might have been appropriate.

The authors thank Simone Goller, Chesterfield & North Derbyshire Royal Hospital NHS Trust.

*Occupational Lung Disease Unit
Birmingham Heartlands Hospital
Birmingham B9 5SS, UK
Tel: +44 121 4240734
Fax: +44 121 7720292
E-mail: arundevvellore@hotmail.com

Accepted for publication 23 June 2006
Allergy 2006; 61:1485–1486
© 2006 The Authors
Journal compilation © 2006 Blackwell
Munksgaard
DOI: 10.1111/j.1398-9995.2006.01215.x

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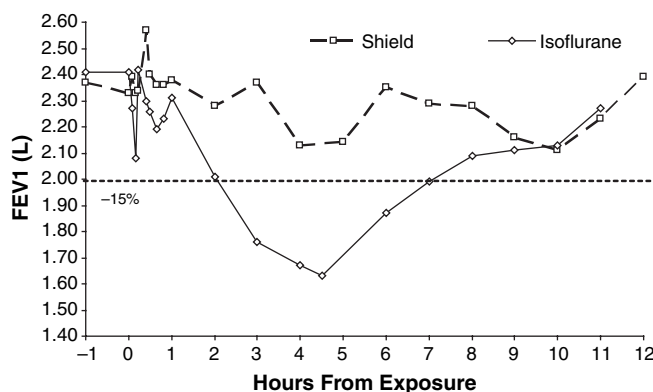


Figure 1. Forced expiratory volume 1 (FEV₁) response to inhaled isoflurane in case 1.