

CASE REPORT

Mixed occupational and iatrogenic allergic contact dermatitis in a hairdresser

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Summary Allergic contact dermatitis (ACD) is a common occupational disease. Hairdressers and beauticians are at increased risk of occupational chronic hand eczema. We present a case of mixed occupational, non-occupational and iatrogenic ACD in a hairdresser which illustrates that delayed diagnosis can result in high morbidity, and unnecessary treatment and cost. A hairdresser with chronic hand and facial eczema failed medical management with topical steroids and dupilumab. Patch testing revealed contact allergy to multiple occupational exposures, home exposures and topical medicaments.

Key words Hairdressers; iatrogenic illness; occupational contact dermatitis.

Background

Allergic contact dermatitis (ACD) is a common occupational disease [1]. Hairdressers and beauticians are at increased risk of occupational chronic hand eczema [2]. ACD is a lymphocyte-mediated, delayed-type (type IV) hypersensitivity reaction which causes chronic pruritic dermatitis. Definitive treatment of ACD primarily is allergen avoidance; however, topical corticosteroids are often used for symptom control [3].

Case presentation

A 48-year-old female Asian hairdresser with a history of asthma but without childhood atopic dermatitis was referred by her allergist with chronic facial and hand dermatitis. She had been a hairdresser for approximately 15 years. She performed hair dying, perming and bleaching, and she used gloves as personal protective equipment. She had performed these tasks for several years without difficulty and then started noticing skin changes. She had burning and pruritic, oedematous eyelids and pruritic fissured hand dermatitis for 5 years with significant worsening over the past 2 years. She felt that her symptoms were exacerbated by workplace exposures but was unable to pinpoint one particular exposure. Because she did not recover clear when she was away from work, occupational disease was not considered likely. She had been diagnosed

with possible latex allergy based on clinical symptoms by a previous physician and had changed to non-latex gloves at work without improvement. Her medicines included: hydrocortisone cream, triamcinolone cream and other topical steroid medicines. Due to worsening symptoms, she was prescribed dupilumab with incomplete resolution. Even on the medication, she had significant quality-of-life impairment and frequent sickness absence due to hand pain, fissuring and swelling, which also resulted in significant loss of income. Physical examination found scaly plaques and papules on both upper and lower eyelids and sparse eczematous papules on the dorsum of her hands and interweb spaces. She was prescribed dupilumab for 1 month and then returned to clinic for patch testing with a TRUE Test, a modified Allergic Contact Dermatitis Society core series, a hairdresser series and her gloves. These tests were chosen based on her exposures. Positive patch test reactions at 96 h included *p*-phenylenediamine (PPD) (1+), glyceryl monothioglycolate (1+), ammonium persulfate (1+), tixocortol-21-pivalate (1+), quaternium-15 (1+), formaldehyde (1+), fragrance mix (1+), disperse orange-3 (doubtful) and mixed dialkyl thioureas (doubtful) (Figure 1).

Long-term occupational exposure to hair treatment chemicals puts hairdressers at risk of sensitization and ACD. PPD is a common hair dye ingredient and a potent sensitizer [4]. Sensitization may also occur to perm chemicals including monothioglycolate or bleaching treatment

Key learning points

What is already known about this subject:

- Hairdressers and beauticians are at increased risk of occupational chronic hand eczema [2], and physicians should take thorough occupational histories when evaluating hand eczema.
- Early diagnosis is important.

What this study adds:

- In addition to looking for occupational causes of hand eczema, it is important to look for consumer and iatrogenic exposures. The disease aetiology may be multifactorial.
- Allergic contact dermatitis should be ruled out before costly, potentially unnecessary treatments are considered.

What this impact may have on practice or policy:

- If allergic contact dermatitis is suspected, it is crucial to perform early patch testing.

chemicals including persulfate [5]. She demonstrated contact allergy to all three of these chemicals. All these treatments were performed in her current or previous workplaces. She also had positive patch testing to tixocortol, which is a marker for group A steroid allergy, including hydrocortisone. She had been using either over-the-counter or prescription topical steroid medicine for at least 5 years. Formaldehyde releasers and fragrance allergens were also found in her personal care products. Her positive reactions to more than one allergen explain why she was unable to pinpoint one exposure and why she had not been improving. Education and allergen avoidance were discussed with the patient, along with discontinuation of group A steroids. She was advised to switch to vinyl gloves and to avoid skin exposure to allergens in the workplace. In addition to switching products, she was advised to avoid dyeing her hair. She was prescribed tacrolimus and desoximetasone for symptom control and was significantly improved at 2-month follow-up. She has deferred restarting dupilumab (Figure 1).

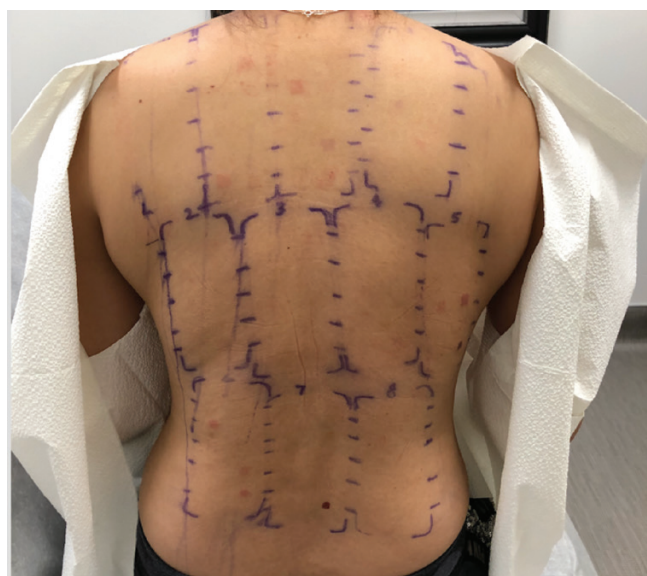


Figure 1. Patient patch test result at 96 h demonstrating multiple positive reactions.

Discussion

ACD, particularly occupational ACD, has profound negative effects on quality of life and may lead to sickness absence, early retirement, loss of job or job change [6]. Early patch testing improves quality-of-life outcomes in hand eczema patients and has been shown to be cost-effective [7–9]. Our patient had ACD resulting from occupational, consumer and iatrogenic exposures. Notably, the clinical misdiagnosis of latex allergy resulted in delay of care. The persistence of dermatitis while away from work also confounded the diagnosis of occupational hair-dye-associated ACD. Dupilumab is approved for moderate-to-severe atopic dermatitis but generally should not be used in atypical cases before ACD is ruled out [10]. Dupilumab is also expensive and likely resulted in significant unnecessary cost. Dupilumab has been reported to improve chronic ACD [11]; however, it should not be used when allergen avoidance is possible. This case highlights the importance of early diagnosis for occupational hand eczema. Allergic contact dermatitis is difficult to diagnose clinically, particularly in atypical cases or for patients with multiple allergies. Patients with atopic diseases may have atopic hand eczema, but several features in this case should raise significant concern for possible ACD including adult-onset, exacerbation by work exposures, frequent glove use and significant resistance to standard treatments.

Competing interest

D.H. is an employee of and relative of the owner of SmartPractice, a company which manufactures and distributes patch test materials. J.E.K. declares no conflicts of interest.

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75 years of Occupational Health at the University of Manchester

The department was founded by Professor Ronald Lane in Manchester in 1945. This was done at the time that great social and welfare projects were launched such as founding the NHS. Lane was the first Professor of Occupational Medicine in the UK, and this was the first Occupational Health department. Lane instituted the formal teaching of Occupational Medicine. However, there were also courses in Occupational Nursing and dedicated undergraduate teaching in Occupational Medicine. Unfortunately, the Nursing course was transferred to the nursing school, and Occupational Medicine was squeezed out of the undergraduate syllabus. This department provided outreach teaching around the globe through the World Health Organization and International Labour Organization.

Research in the early days reflected the manufacturing base of the economy at the time. There was research into the occupational effects of lead, cadmium, antimony and vanadium, cardiovascular disease in cotton workers, byssinosis, rheumatism in miners, resettlement of workers and neurosis in factory workers. Lane was joined by Richard Schilling who focussed on the diseases of cotton workers and identified byssinosis as a discrete disease entity. Of the staff working with Lane nine went on to become Professors in their own right.

Lane retired in 1964 and Tommy Scott took over as head of department. Scott's interest was in the investigation of bladder cancer in chemical workers. Work was also performed by Atherley on the relationship between noise exposure and effects on hearing. This led to the initial noise regulations and development of preventive strategies. Michael Flindt joined the department in 1968 and researched occupational asthma.

Scott retired in 1971 and Tim Lee took over. Research focus included electric shock, oral cancer in textile workers, skin cancer, lead levels/poisoning indices, pulmonary function standards and occupational asthma. In the 1980s there was a major innovation in teaching with the move to a new all distance learning course. This was trialled in 1983–84. This first course of 24 students was launched in 1984. Occupational Hygiene was added in 1990s.

Lee retired in 1987. There was no chair appointed in his place, and the department was under threat. However, with much lobbying the department was saved

and Nicola Cherry was appointed as head in 1991. With a background in psychology, Cherry's research interests focussed on subjects such as neurotoxicity, and Gulf War Syndrome. The Health and Safety Executive also funded Occupational Disease Ascertainment Activities (ODIN). This scheme charted the pattern of occupational disease reported by practitioners.

Raymond Agius was appointed professor in 2001. Agius continued to develop the teaching and learning resources at undergraduate and postgraduate level, with a particular focus on online learning. He also managed to secure continued funding from for the Occupational disease reporting scheme (renamed to The Occupation and Health Research network—THOR) and managed to set up scheme for General Practitioners (GP-THOR). Agius expanded the research of the department to include also environmental risk factors, in particular the effect of urban air pollution and health, whilst also continuing to work on occupational lung disease, back pain and stress.

Martie van Tongeren took over as head of department in 2017. There has been further development in the distance and online teaching programme in occupational medicine. There is also an Occupational Health MSc currently in development. Research in air pollution is ongoing and the Occupational Illness Reporting Scheme continues. The department is currently adapting to life under the Coronavirus. The distance learning nature of the courses makes them appropriate for the new reality. The department is looking to further develop with assessments being done remotely also, and face-to-face lectures being replaced with online resources such as webinars.

The Academic Centre of Occupational and Environmental Medicine (ACOEM) at the University of Manchester is one of the few remaining centres in the UK for teaching Occupational Medicine. The loss of any of those departments would represent a serious threat to the future of the specialty in the UK.

Competing interests

The author is a senior lecturer at ACOEM.

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