

reactions to tattoo dyes are notoriously recalcitrant to treatment. Previous reports have cited limited benefit from potent topical and intralesional steroids but promising results from the erbium:YAG laser.³ Others have advocated complete excision and split-skin grafting.⁴

Our patient responded well to topical tacrolimus ointment 0.1%. The systemic form of this potent macrolide immunosuppressant is routinely used to prevent allograft rejection while the topical preparation has effected a dramatic improvement in some patients with severe atopic dermatitis. The drug suppresses T-cell activation and proliferation, and these properties have led to some promising results in the treatment of vulvovaginal lichen planus with tacrolimus ointment and also oral lichen planus with an aqueous solution of tacrolimus (0.1 mg/100 mL) used as a mouthwash.⁵

Our patient illustrates the potential benefits of tacrolimus therapy where other agents have failed and where interventions such as laser treatment or plastic surgery may not be readily available or financially viable.

F. A. Campbell and G. Gupta

Department of Dermatology, Monklands Hospital, Airdrie, Lanarkshire, UK

E-mail: girish.gupta@lanarkshire.scot.nhs.uk

Conflict of interest: none declared.

Accepted for publication 5 September 2005

References

- 1 Corazza M, Zampino MR, Montanari A *et al*. Lichenoid reaction from a permanent red tattoo: has nickel a possible aetiological role? *Contact Dermatitis* 2002; **46**: 114–15.
- 2 Mortimer NJ, Chave T, Johnstone GA. Red tattoo reactions. *Clin Exp Dermatol* 2003; **28**: 508–10.
- 3 De Argila D, Chaves A, Moreno JC. Erbium:Yag laser therapy of lichenoid red tattoo reaction. *J Eur Acad Dermatol Venerol* 2004; **18**: 332–3.
- 4 Goldberg HM. Tattoo allergy. *Plast Reconstr Surg* 1996; **98**: 1315–16.
- 5 Evans AV. The expanding role of topical tacrolimus in dermatology. *Clin Exp Dermatol* 2005; **30**: 111–15.

Angio-oedema in a child due to eating tomatoes after exercise

doi: 10.1111/j.1365-2230.2005.02013.x

We describe a 8-year-old boy who experienced angio-oedema induced by eating tomatoes after exercise. The suspected diagnosis was demonstrated by exercise and food challenge.

Athletic activity can precipitate several types of physical urticaria and angio-oedema. Angio-oedema occurring with exercise commonly represents one of the symptoms of a physical allergy named exercise-induced anaphylaxis (EIA),

even if there are no vascular or respiratory manifestations.¹ Cofactors such as food ingestion before exercise can be a trigger for developing EIA.² Angio-oedema due to ingestion of tomatoes after exercise in childhood has not been reported in the literature.

An 8-year-old boy was referred to our department for facial angio-oedema and tongue tingling 15 min after a football training session. Symptoms were relieved by antihistamines. He had experienced two similar episodes previously. In all circumstances, symptoms occurred at the end of the exercise, about 5 min after eating a tomato pizza (which included tomatoes, wheat and milk). After the last episode, wheat or milk ingestion following exercise did not evoke any symptom.

The boy had never experienced any reaction in response to exercise or related to the intake of foods without exercise. He had been suffering from hay fever since the age of 5 years and had had asthma in early childhood. There was no family history of food allergy or anaphylaxis.

Skin-prick tests (SPT) with commercial extracts for common inhalants and foods, were positive for soy (+), corn (+), peas (+), tomato (+), carrot (+), grass (++++), house dust mites (+++), hazel (++), mugwort (*Artemisia vulgaris*; +) and plantain (*Plantago lanceolata*; +++). Specific IgE antibodies were positive for grass and house dust mites but negative for foods (milk, fish, egg white, egg yolk, wheat, corn, rice, tomato, carrot, potato, peanuts, peas).

Our patient underwent four exercise-challenge tests³ on distinct days: after 12 h of fasting; after eating cow's milk and bread; after eating fresh tomatoes; and five minutes before eating fresh tomatoes. The exercise test consisted of 6 min of indoor free running, increasing the heart rate to at least 170 beats/min. A spirometry was performed before running and 6, 10, 12 and 15 min after the beginning of the exercise.

The first three tests were negative, but facial angio-oedema and conjunctivitis appeared immediately after eating tomatoes at the end of the exercise. Lung-function and blood-pressure values were normal. Symptoms resolved after the patient received antihistamines and corticosteroids.

The unique aspect of this case is that tomato intake elicited angio-oedema only after exercise. This is the first case documented by challenge. A review of the literature revealed only one report,⁴ of a 39-year-old woman with urticaria and gastrointestinal symptoms after ingesting celery following exercise. In that case, diagnosis relied on the history. In our patient, questioning and SPTs were only helpful for suspicion of inducing factors.

The mechanisms of EIA related to food remain elusive. Exercise may lower the mast-cell threshold for mediator release,⁵ thus, tomato allergens may provide an IgE-mediated stimulus for exceeding this threshold. The restriction of angio-oedema to the face may be related to an individual response or to the closeness to the oral cavity.

Clinicians should be aware that identification of triggering factors is recommended both to prevent further

reaction and to avoid unwarranted restriction of physical activity or diet. Our case may clarify why challenge tests are negative in some patients with EIA.

C. Caffarelli, C. Zinelli, G. Trimarco, T. Petroccione and S. Bernasconi

Dipartimento dell'Età Evolutiva, Clinica Paediatrica, Università di Parma, Via Gramsci 14, 43100 Parma, Italy
E-mail: carlo.caffarelli@unipr.it
Conflict of interest: none declared.
Accepted for publication 5 September 2005

References

- 1 Briner WW. Physical allergies and exercise: clinical implications for those engaged in sports activities. *Sports Med* 1993; **15**: 365–73.
- 2 Aihara Y, Takahashi Y, Kotoyori T *et al.* Frequency of food-dependent, exercise-induced anaphylaxis in Japanese junior-high-school students. *J Allergy Clin Immunol* 2001; **108**: 1035–9.
- 3 Kattan M, Keens TG, Mellis HG *et al.* The response to exercise in normal and asthmatic children. *J Pediatr* 1978; **92**: 718–23.
- 4 Kidd JM, Cohen SH, Sosman AJ *et al.* Food-dependent, exercise-induced anaphylaxis. *J Allergy Clin Immunol* 1983; **71**: 407–11.
- 5 Casale TB, Keahey TM, Kaliner M. Exercise-induced anaphylactic syndromes: insights into diagnostic and pathophysiological features. *JAMA* 1986; **255**: 2049–53.

Delayed pressure urticaria controlled by tranexamic acid

doi: 10.1111/j.1365-2230.2005.02014.x

Delayed pressure urticaria is an uncommon but disabling condition. It usually responds poorly to treatment. We report a patient with delayed pressure urticaria that was successfully treated with tranexamic acid.

A 41-year-old woman gave an 18-month history of painful red swellings of her skin occurring approximately weekly. These swellings appeared 4–6 hours after pressure, e.g. on her feet after walking, or on her shoulder after carrying a bag. The lesions were limited to sites of pressure contact, lasted approximately 24 h and were unresponsive to antihistamines. She was otherwise in good health and on no regular medication.

Investigations, including complement levels, C1 esterase inhibitor levels and full blood count, were normal. A diagnosis of delayed pressure urticaria was made clinically. The established treatment is prednisolone, but long-term steroid use was not thought to be justified. We therefore commenced her on tranexamic acid 500 mg twice daily, which was unhelpful, but 500 mg three times daily without any concurrent medication controlled her symp-

toms. However, she complained of significant dizziness, a known side-effect. She was advised to take 250 mg five times daily, which gave complete control without any adverse effects. After 8 weeks on this treatment she remained symptom-free, suggesting that the tranexamic acid was controlling her delayed pressure urticaria.

Pure delayed pressure urticaria is unusual.¹ It is a mechanical urticaria in which painful, deep, erythematous swellings occur at sites of sustained pressure applied to the skin, for example, under tight clothing and on the buttocks and lower back after sitting, after a delay of 30 min to 1 h. Pressure is thus often overlooked as being the precipitating factor. The lesions last 12–72 h and are often associated with systemic symptoms such as malaise, arthralgia and myalgia.

The response to treatment is often unsatisfactory. It is generally resistant to antihistamines, although these may help coexisting ordinary urticaria. Nonsteroidal anti-inflammatory drugs may be helpful but can exacerbate ordinary urticaria. Drugs inhibiting granulocyte infiltration, such as montelukast, colchicine and sulfasalazine have also been used but are not of proven value. Systemic steroids are generally the most effective short-term therapy, but the doses required are usually unsuitable for long-term treatment.

Tranexamic acid is used mainly as an antifibrinolytic agent and is also a well-documented treatment for hereditary angio-oedema, at doses of 2–4.5 g daily. It has been reported as a possible treatment for chronic urticarias², in particular physical urticarias. Martens reported the successful treatment with tranexamic acid of chronic urticarias resistant to conventional therapies.³ In this open trial, 9 of 11 patients with delayed pressure urticaria had an improvement of their symptoms with tranexamic acid 500 mg three times daily. Adverse reactions, observed in 35% of patients, included headache, nausea, abdominal pain, flushing and tiredness. Tranexamic acid has a hypothetical increased risk of thrombotic disorders and is contraindicated in patients with active thromboembolic disease. There are, however, no formal epidemiological studies demonstrating this link and no useful haematological tests to monitor for this side-effect. It can thus be used with caution if there is no personal or family history of thromboembolic disease. Liver function should be checked every 6 months on long-term prophylaxis. Tranexamic acid should be discontinued immediately should thrombosis or change in colour vision develop.

This case serves as a reminder that tranexamic acid can be an effective treatment for delayed pressure urticaria.

C. Shedden and A. S. Highet

Department of Dermatology, York Hospital, Wigginton Road, York, UK

Dr Christina Williams, Department of Dermatology, York Hospital, Wigginton Road, York, YO31 8HE, UK.

E-mail: tinawilliams@doctors.org.uk

Conflict of interest: none declared.

Accepted for publication 5 September 2005