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Case Report Open Access

Unilateral Gustatory Flushing: A Variant of Frey's Syndrome?

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Abstract

We report two cases of unilateral gustatory flushing presenting in infancy. This is considered to be a variant of Frey's syndrome, whereby in children, aberrant sweating is often absent. It occurs as a result of damage, either following perinatal birth trauma or infection. Misdirected regeneration of the parasympathetic fibres of the auriculotemporal nerve results in localised erythema occurring in a fixed distribution. In children, this condition is harmless, spontaneous resolution has been reported and no treatment is required. However, more recently botulinum toxin injections have been proposed for adolescents in whom this may be socially distressing.

Keywords: Flushing; Gustatory; Frey's syndrome

Correspondence

Frey's syndrome (also sometimes referred to in the literature as auriculotemporal syndrome) is a rare condition first described by Dunphenix in 1757. It gained its eponym in 1923, after Frey reported the syndrome in a patient who was shot in the parotid gland [1]. It comprises recurrent episodes of gustatory flushing and/or sweating occurring in the distribution of the auriculotemporal nerve, which arises from the mandibular division of the trigeminal nerve [2]. The auriculotemporal nerve carries sensory fibres as well as parasympathetic fibres to the parotid gland and sympathetic fibres to the cutaneous vessels and eccrine glands.

We report two cases of unilateral facial flushing of different aetiology, highlighting the spectrum of disease and reviewing the need to consider Frey's syndrome as the cause for this presenting complaint.

Case 1

A 3-year-old girl presented with an intense episodic erythema affecting the left cheek from the age of 4-months-old. This occurred only when ingesting food or drink and never spontaneously. Ingestion of all foods, but particularly sweets, gingerbread biscuits and fruit, resulted in a well-circumscribed erythema affecting the left cheek only. This fixed erythema occurred almost immediately upon eating with flushing lasting between 2 to 15 minutes after stopping eating. There was no associated facial swelling, lacrimation, sweating, rhinorrhoea or increased salivation. Of note, the child was born at 40+2 weeks by emergency caesarean section following foetal distress and a failed forceps delivery. Developmental milestones were reached without delay. Past medical history included mild asthma for which the child occasionally requires a Salbutamol inhaler.

On examination the child was alert and well. Within a minute of eating fresh fruit, a well-circumscribed erythematous patch was observed in the left pre-auricular region extending towards the angle of the mouth (Figure 1). This was asymptomatic. Pupils were equal and reactive and there was no associated sweating or neurological deficit. The rest of the examination was normal.

Case 2

A 4-month-old girl presented to the dermatologists with multiple skin-coloured lesions, first noted shortly after birth, and subsequently increasing in number. New lesions continued to develop over a period of 12 months. In addition, on introduction of solid food, the child experienced left sided facial erythema occurring within minutes of eating. There was no associated sweating or any other neurological signs. Relevant obstetric history included severe maternal varicella zoster virus (VZV) infection at 21 weeks gestation. Delivery was induced at 38 weeks, because of maternal diabetes. The final stage of labour was rapid and the child was born with the cord around its neck, subsequently developing marked facial bruising and sub-conjunctival haemorrhage. The child was otherwise healthy.

On examination, there were multiple oval atrophic scars on the trunk and lower limbs. Upon eating, an intense macular erythema was once again provoked by chewing of any foods occurring in a fixed distribution on the left cheek, lasting for up to an hour (Figure 2). A lesional skin biopsy of one of the scars was unremarkable suggesting

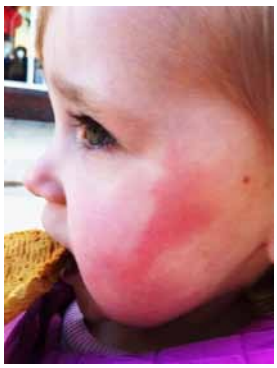

Figure 1: Unilateral erythema in the distribution of the auriculotemporal nerve upon eating gingerbread biscuits in a 4-year-old girl.

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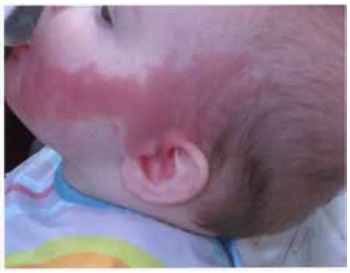

Figure 2: Unilateral intense flushing affecting the left cheek in a four month old infant upon eating.

scarring secondary to primary varicella infection. At 6 months, both child and maternal serum levels of VZV IgM antibody were low indeterminate levels and at 12 months, it was no longer detected.

Discussion

Unilateral gustatory flushing of unknown aetiology is rare, with around 70 cases reported in the literature, to date. In children it has been described as a sequel to perinatal birth trauma, resulting from assisted forceps delivery and this was definitely the cause for case 1 but also could have accounted for the traumatic birth of the infant in case 2. In the latter, VZV infection is an alternative cause, and this virus has been reported to affect the auriculotemporal nerve. The inflammatory process associated with VZV infection is followed by a certain amount of destruction, which can inevitably lead to disordered nervous impulses in the affected area.

The condition generally presents before the age of 1 year, and most commonly presents when the child is weaned onto solid foods. It is surmised that flushing doesn't occur with breastfeeding or taking formula because vigorous chewing is needed for solid foods which elicits a more intense stimulation of the parotid gland resulting in aberrant flushing [3-7]. It is important to exclude an IgE-mediated food allergy, which also occurs immediately following ingestion of food and in the two reported cases this was done [3,8]. More commonly observed in adults, Frey's syndrome invariably comprises flushing associated with gustatory sweating within the cutaneous distribution of the auriculotemporal nerve. This occurs following surgery, trauma or disease of the parotid gland [1,9].

The most widely accepted explanation for Frey's syndrome is the transection of postganglionic parasympathetic secretomotor fibres from the otic ganglion originally directed to the parotid gland, followed by aberrant re-innervation of the denervated facial cholinergic sweat glands and blood vessels [1]. Mechanisms for flushing include misdirected regeneration or collateral sprouting of parasympathetic fibres into sympathetic pathways in the auriculotemporal and nearby nerves [1,10,11] and/or release of bradykinin-producing enzymes by activated sweat glands resulting in vasodilatation [12]. Functional connections slowly develop between parasympathetic secretomotor and vasodilator fibres and sympathetically-denervated sweat glands and cutaneous blood vessels. This results in aberrant sweating and/or flushing as a result of activation of the parotid gland upon chewing.

Reports have demonstrated botulinum toxin (Botox) in controlling gustatory sweating [13-15]. Since parasympathetic secretomotor fibres use acetylcholine as a neurotransmitter and sweat glands have cholinergic muscarinic receptors, Botox abolishes the cholinergic activation of denervated sweat glands during salivation. More recently, however Botox was demonstrated to inhibit gustatory flushing [16] which implies that cholinergic neurones mediate cutaneous vasodilation. However, studies have established that flushing persistent after sweating was blocked by atropine implicating other vasodilator substances [17,18]. The release of vasoactive intestinal polypeptide (VIP) or a related neuropeptide from regenerating parasympathetic fibres could conceivably contribute to the process, perhaps by activating sympathetic vasodilatation in the facial skin [19-21].

In both the cases presented, the children were asymptomatic from their gustatory flushing. Although this condition is harmless and spontaneous resolution has been observed, aberrant gustatory flushing causes anxiety for parents and significant social distress in some patients. For the latter affected individuals, botulinum toxin has emerged as a safe and effective treatment for gustatory flushing and can be considered in selected cases [16].

References

1. Frey L (1923) Le syndrome du nerf auriculo-temporal. Rev Neurol 97-104.
2. Kaddu S, Smolle J, Komericki P, Kerl H (2000) Auriculotemporal (Frey) syndrome in late childhood: an unusual variant presenting as gustatory flushing mimicking food allergy. Pediatr Dermatol 17: 126-128.
3. Dizon MV, Fischer G, Jopp-McKay A, Treadwell PW, Paller AS (1997) Localized facial flushing in infancy. Auriculotemporal nerve (Frey) syndrome. Arch Dermatol 133: 1143-1145.
4. Karunananthan CG, Kim HL, Kim JH (2002) An unusual case of bilateral auriculotemporal syndrome presenting to an allergist. Ann Allergy Asthma Immunol 89: 104-105.
5. Kozma C, Gabriel S (1993) Gustatory flushing syndrome. A pediatric case report and review of the literature. Clin Pediatr (Phila) 32: 629-631.
6. Rodriguez-Serna M, Marí JI, Aliaga A (2000) What syndrome is this? Auriculotemporal nerve (Frey) syndrome. Pediatr Dermatol 17: 415-416.
7. Sampson HA (1986) Differential diagnosis in adverse reactions to foods. J Allergy Clin Immunol 78: 212-219.
8. Sicherer SH, Sampson HA (1996) Auriculotemporal syndrome: a masquerader of food allergy. J Allergy Clin Immunol 97: 851-852.
9. Harper KE, Spielvogel RL (1986) Frey's syndrome. Int J Dermatol 25: 524-526.
10. Laage-Hellman JE (1958) Gustatory sweating and flushing; aetiological implications of latent period and mode of development after parotidectomy. Acta Otolaryngol 49: 306-314.
11. Laage-Hellman JE (1957) Gustatory sweating and flushing after conservative parotidectomy. Acta Otolaryngol 48: 234-252.
12. Fox RH, Hilton SM (1958) Bradykinin formation in human skin as a factor in heat vasodilatation. J Physiol 142: 219-232.
13. Laccourreye O, Akl E, Gutierrez-Fonseca R, Garcia D, Brasnu D, et al. (1999) Recurrent gustatory sweating (Frey syndrome) after intracutaneous injection of botulinum toxin type A: incidence, management, and outcome. Arch Otolaryngol Head Neck Surg 125: 283-286.
14. Schulze-Bonhage A, Schroder M, Ferbert A (1996) Botulinum toxin in the therapy of gustatory sweating. J Neurol 243: 143-146.
15. Laskawi R, Drobik C, Schönebeck C (1998) Up-to-date report of botulinum toxin type A treatment in patients with gustatory sweating (Frey's syndrome). Laryngoscope 108: 381-384.
16. Tugnoli V, Marchese Ragona R, Eleopra R, Quatrale R, Capone JG, et al. (2002) The role of gustatory flushing in Frey's syndrome and its treatment with botulinum toxin type A. Clin Auton Res 12: 174-178.
17. YOUNG AG (1956) Unilateral sweating of the submental region after eating (chorda tympani syndrome). Br Med J 2: 976-979.
18. Uprus V, Gaylor JB, Carmichael EA (1934) Localised abnormal flushing and sweating on eating. Brain 57: 443-453.
19. Lundberg JM, Anggård A, Fahrenkrug J, Hökfelt T, Mutt V (1980) Vasoactive intestinal polypeptide in cholinergic neurons of exocrine glands: functional

significance of coexisting transmitters for vasodilation and secretion. Proc Natl Acad Sci U S A 77: 1651-1655.

20. Hökfelt T, Johansson O, Ljungdahl A, Lundberg JM, Schultzberg M (1980) Peptidergic neurones. Nature 284: 515-521.

21. Drummond PD (2002) Mechanism of gustatory flushing in Frey's syndrome. Clin Auton Res 12: 144-146.

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