

Prevalence of gold contact hypersensitivity in the West of Scotland

COLIN FLEMING, ANGELA FORSYTH¹ AND RONA MACKIE

University Department of Dermatology, Western Infirmary and

¹Contact Dermatitis Investigation Unit, Glasgow Royal Infirmary, Glasgow

373 patients attending for routine patch testing were tested with 0.5% and 0.05% gold sodium thiosulfate (GST). 8 (2.1%) patients had a positive patch test, and a further 4 (1.0%) patient reactions which were interpreted as irritant. 2 out of 8 patients with a positive patch test to GST suspected gold allergy prior to testing, and both of these patients reported that their eczema resolved if they avoided gold jewellery. This is the lowest prevalence of hypersensitivity to GST reported and suggests that gold contact allergy may not be as widespread as has been recently proposed.

Key words: patch testing; gold sodium thiosulfate; allergic contact dermatitis; clinical relevance.
© Munksgaard, 1997.

Accepted for publication 3 March 1997

For many years, allergic contact dermatitis (ACD) from inert metals, such as gold, was considered to be rare. However, a number of recent studies have suggested that hypersensitivity to the gold salt, GST, may be common (1-4), although the relevance of patch testing with this material is not yet fully known.

We set out to determine the prevalence and clinical relevance of cutaneous hypersensitivity to GST in the population of patients attending for routine diagnostic patch testing in Glasgow. We did this by addition of GST to the European standard series, questionnaire analysis of patients prior to patch testing, and comparison of the features of patients with and without positive patch tests to GST.

Patients and Methods

The study was approved by the local ethics committee. All patients attending the Contact Derma-

titis Investigation Unit, Royal Infirmary, Glasgow, from February until October 1996, were included in the study. 373 patients were tested to 0.5% and 0.05% GST (Chemotechnique, Malmö, Sweden) in petrolatum (pet.), in addition to other routine investigations. The tests were attached using Finn Chambers and Scanpor tape. Patches were removed after 2 days and read after 2 and 4 days.

All patients completed a questionnaire (modified from Bruze (1)) prior to patch testing, and the MOAHL index, sites of dermatitis and other positive patch tests were analysed.

Results

8 patients (2.1%) had a positive patch test to either 0.5% or 0.05% GST, or both. A further 4 (1%) had reactions to GST which were thought to be morphologically irritant on examination. The mean age of those patch tested was 42 years (range

Table 1. MOAHL index for patients patch tested to GST

	% of patients				
	male	occupational dermatosis	atopy	hand dermatitis	leg ulcer/stasis dermatitis
positive patch test to GST (n=8)	25	0	12.5	37.5	0
negative patch tests to GST (n=365)	29	12	34	36	5

Table 2. The questionnaire

1. What kind of jewellery do you normally wear ?
2. Are your ears pierced ?
3. If yes to question 2, at what age were your ears pierced ?
4. Do you regularly wear any gold objects (for example, rings)?
5. Do you have any gold fillings in your teeth ?
6. Have you ever been treated with gold for arthritis ?
7. Do you think you are allergic to gold?
8. Does your eczema go away if you stop wearing gold jewellery?

3–88 years). The MOAHL index for all patients is given in Table 1. The MOAHL index was broadly similar in the groups with positive and negative patch tests to GST, although the number of positive results was too small for meaningful statistical comparison.

The questionnaire is shown in Table 2. 4 out of 8 patients (50%) with a positive patch test to GST responded 'gold' in answer to question one, compared to 286/358 (80%) patients with negative tests. 5 of the 8 positive patients (63%) and 232/351 (66%) of the negative group had their ears pierced. The mean age of ear-piercing was 17 years in the positive group and 18 in the negative group, and the mean time since the ears had been pierced was 17 years, and 22 years, respectively. The majority of patients in both groups admitted to regularly wearing gold objects (5/8 in the positive group, 262/362 in the negative group, i.e., 63% and 72%, respectively). 25 patients (7%), all in the negative sample, had gold fillings in their teeth, and 5 (1%), also all in the negative group, had received treatment with gold for arthritis. 2 (25%) patients with positive and 6 (2%) with negative patch tests to GST thought they were allergic to gold before investigation, and 2 (25%) patients positive to GST thought their eczema resolved after avoidance of gold jewellery, compared with 8 (2%) of those negative to GST.

The details of patients with positive patch tests to GST are given in Table 3. 6 patients had other positive reactions and 4/5 women also reacted to nickel.

Discussion

Gold allergy is a fertile area for study. ACD to gold may be about to increase as body piercing is increasing in frequency and EC directives have come into force in 1996 to limit nickel content in piercing metals (5). Furthermore, patch testing with gold often produces long lasting responses (6, 7). The relevance and mechanism of this response is unknown, but study of this has ramifications for the study and treatments of chronic cutaneous conditions other than contact dermatitis, such as lymphomas and photosensitive dermatitis.

It has been proposed that GST is a good marker for gold allergy (8), and recent studies have suggested that allergic contact dermatitis from GST may be relatively common. Bruze et al. routinely patch tested 1056 patients and found 10% had positive patch tests to this salt, the 2nd most common allergen after nickel sulfate in their population (1). McKenna et al. (2), and Sabroe et al. (3), found 4.6% and 13%, respectively, of their populations attending for patch testing had positive responses to GST, and Rasanen et al. (4) reported 12.4% of dental patients had a positive patch test to GST. Despite this high frequency of apparent gold allergy, the relevance of a positive patch test to GST remains unclear.

The patch test response to GST appears to represent true ACD, rather than irritant contact dermatitis (9). Positive reactions to the salt occur at serial dilutions and often the patch test reaction is crescendo in nature, weak on day (D) 3 but fully developed by D 7. There is also a high correlation between epicutaneous and intracutaneous testing, characteristic of contact allergy (10).

In this study, 2.4% of patients had a positive patch tests to GST. This prevalence of patients with a positive patch test to GST is considerably lower than has previously been reported. Gold exposure comes mainly from jewellery and dentistry. In this study 72–80% of all patients wore gold regularly, compared with 88% (1) and 82% (3) reporting previous direct skin contact with gold ob-

Table 3. Details of patients with positive patch tests to GST

Age (years)	Sex	Atopy	Occupation	Condition	Other positive patch tests
43	M	yes	brickwork supervisor	generalised eczema	fragrance mix
20	F	no	catering assistant	hand eczema	rubber, nickel
25	F	no	clerkess	mouth ulcers	nickel, cobalt
28	M	no	counsellor	eyelid eczema	neomycin, gentamicin, quinoline, fragrance mix
39	F	no	unemployed	hand eczema	none
28	M	no	unemployed	urticaria	none
48	F	no	hairdresser	hand eczema	cinammon, benzoic acid, sorbic acid, nickel, neomycin
50	F	no	housewife	face/arm eczema	fragrances, nickel, rubber, ethylenediamine

jects. 7% of patients in this study reported wearing gold fillings, compared with 30% (1) and 14% (3). Thus our sample population may have lower total gold exposure than other populations studied. The lowest frequencies of GST hypersensitivity have been reported from Glasgow and Belfast (2). The populations of these 2 cities have considerable genetic overlap, which may be relevant.

Comparison of groups with positive and negative patch tests to GST revealed some features of GST hypersensitivity. As demonstrated in previous studies (1, 3), it was not common in atopics and was not associated with a history of dental or systemic gold. There was also no evidence that gold hypersensitivity is related to ear-piercing. Symptoms and suspicion of gold allergy were more common in the group with positive reactions, but 6/8 of these patients had no history suggesting gold contact dermatitis. 2 patients with positive patch tests to GST had no history of gold jewellery, dental gold or suspicion of gold allergy. Interpretation of these results is limited by the small numbers of positive reactions, but suggests that gold allergy is not a major clinical problem in the population we studied.

It is useful to subdivide individuals into 4 groups with respect to gold contact allergy, on presence and absence of history and patch test findings. Most commonly there is no history of gold allergy and patch tests are negative. Rarely there are patients who have a good history of gold allergy with positive patch tests to GST. There is a third subset, of varying prevalence, who have positive patch tests but no good history, and a fourth group, who have yet to be studied, who have a history suggestive of gold sensitivity and negative patch tests. Elucidation of the significance of patch testing with GST may depend on study of the latter 2 groups.

Acknowledgement

We would like to thank Dr. David Burden for his comments on the manuscript.

References

1. Bruze M, Edman B, Björkner B, Möller H. Clinical relevance of contact allergy to gold sodium thiosulfate. *J Am Acad Derm* 1994; 31: 579-583.
2. McKenna K E, Dolan O, Walsh M Y, Burrows D. Contact allergy to gold sodium thiosulfate. *Contact Dermatitis* 1995; 32: 143-146.
3. Sabroe R A, Sharp L A, Peachey R D G. Contact allergy to gold sodium thiosulfate. *Contact Dermatitis* 1996; 34: 345-348.
4. Rasanen L R, Kalimo K, Laine J et al. Contact allergy to gold in dental patients. *Br J Dermatol* 1996; 134: 673-677.
5. Delescluse J, Dinot Y. Nickel allergy in Europe: the new European legislation. *Dermatology* 1994; 189(suppl 2): 56-57.
6. Bruze M, Edman B, Björkner B, Möller H. The development and course of test reactions to gold sodium thiosulfate. *Contact Dermatitis* 1995; 33: 386-391.
7. Aro T, Kanerva L, Hayrinen-Immonen R et al. Long lasting allergic patch test reaction caused by gold. *Contact Dermatitis* 1993; 28: 276-281.
8. Fowler J F. Selection of patch test materials for gold allergy. *Contact Dermatitis* 1987; 17: 23-25.
9. Björkner B, Bruze M, Möller H. High frequency of contact allergy to gold sodium thiomalate. *Contact Dermatitis* 1994; 30: 144-151.
10. Bruze M, Björkner B, Möller H. Skin testing with gold sodium thiomalate and gold sodium thiosulphate. *Contact Dermatitis* 1995; 32: 5-8.

Address:

C. J. Fleming
University Department of Dermatology
Western Infirmary
Glasgow
Scotland G11 6NT
UK

This document is a scanned copy of a printed document. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material.