

Thimerosal – Is it really irrelevant?

DAN SLODOWNIK AND ARIEH INGBER

Department of Dermatology, Hadassah university hospital, Jerusalem, Israel

Recently, several investigators claimed that thimerosal is one of the most irrelevant allergens existing in screening for contact dermatitis. 508 patients who were suspected to have allergic contact dermatitis were patch tested at our clinic. They completed a questionnaire including medical, demographic and occupational details. We used the standard tray of chemotechnique diagnostics (Malmö, Sweden) and additional series, which were case relevant. The relevance of the allergic reaction to thimerosal was scored from 1 to 6. 19 patients (3.7%) had an allergic reaction to thimerosal. 6 (31.5%) had a definite relevance and 8 (42.1%) had a probable relevance. Only 3 patients (15.8%) had an irrelevant reaction. SPIN value (significance–prevalence index number) was 2281. We found a high proportion of mechanics (42.1%) among the patients who had positive reaction to thimerosal ($P < 0.0001$). Although previous reports found thimerosal highly irrelevant, our daily experience being supported by the above data indicates that positive reactions to thimerosal could be relevant for many patients.

Key words: allergic contact dermatitis; relevance; thimerosal. © Blackwell Munksgaard, 2005.

Accepted for publication 30 May 2005

Thimerosal is a preservative used in vaccines, topical medications, oils and cosmetics. It is one of the most common allergens in North America (1, 2) and worldwide (3–6).

Recent studies raised the possibility (1, 7, 8) that most of the positive reactions to thimerosal are irrelevant. Moreover, one study (9) showed that 91% of thimerosal allergic patients, based upon open or closed patch testing, tolerated intramuscular administration of the allergen. The remaining 9% had only mild local reaction.

The purposes of our study are to assess the prevalence of thimerosal allergy at our patch test clinic and the relevancy of positive reaction and to characterize the allergic patients.

Materials and Methods

508 consecutive patients who were suspected to have allergic contact dermatitis were patch tested. All were evaluated for medical history, demographic and occupational information. They were patch tested to the European standard tray (Chemotechnique Diagnostics) and additional series according to anamnesis and clinical findings.

Some of them were patch tested to their own relevant materials.

Results were recorded at D2 and D4. We used Suneja's scoring (Table 1) to assess individual relevancy. SPIN value (significance–prevalence index number) (10) was calculated in order to incorporate relevancy into a measurable value. Comparisons of the variables were tested by χ^2 test and Yates correlation.

Results

19 patients (3.7%) had a positive reaction to thimerosal. There are no significant differences between allergic and non-allergic group, except one – the profession.

There was a very high proportion (42.1%) of mechanic workers in the allergic group ($P < 0.0001$) (Fig. 1). We found a high proportion of nickel allergy among thimerosal allergic group (26.3%), but the difference comparing with thimerosal-non-allergic group is not significant ($P = 0.1$). Face is the most common location for dermatitis among thimerosal sensitive group (36.9%), followed by palms (31.6%). Eyelids were the third common location with 21.1%.

6 patients (31.6%) of thimerosal sensitive had definite relevancy for positive reaction.

8 (42.1%) had a probable relevancy, based upon patch testing to their own materials and

Table 1. Relevance scoring (8)

1	Definite: Patient tested and reacted to product known to contain the allergen
2	Probable: Patient known to have contact with a product known to contain allergen but not tested to product
3	Possible: Patient likely to have contact with product known or suspected to contain allergen but not tested to product
4	Past: Patient previously had problems with this allergen but no longer has exposure
5	Unknown
6	Not applicable

laboratory analysis proving thimerosal presence. Only 3 patients (15.8%) reported an irrelevant reaction.

SPIN value was calculated to be 2281.

Discussion

In contrast to former studies (1–6, 11), our study population shows a relatively low (3.7%) percentage of positive reactions to thimerosal but a much higher relevant ones. A high proportion of thimerosal positive reactions (approximately 73%) was found to be clinically relevant.

This is an extremely high proportion comparing with other (1, 8, 11) reports, whose relevancy rate was only 8–16%. Another way for demonstrating these different results is by SPIN value, which is around 10-fold higher than former studies. It should be emphasized that most (58%) of the thimerosal sensitive patients had only single positive reaction on patch testing. That and the high relevant reactions ratio contradict the low possibility of irritant rather than allergic origin.

Israeli policy and profile of vaccination use was always similar to other western countries, so we should find other possible explanations.

We found 2 possible reasons for these results. First is that our patch test clinic is a referral centre for the army. We deal with a population which goes through 3 years of intensive military

service. Most of these soldiers are in maintenance professions, meaning intensive dirty work, not always able to use protection aids. Some oils and cooling fluids contain thimerosal as a preservative (12). That explains the significant proportion of mechanics in thimerosal allergic group. That also explains the high proportion of hand dermatitis compared with periorbital location in other studies (8, 13).

Another possible explanation, supported by a high proportion of facial dermatitis among positive reactors, is a lack of clear legislation concerning cosmetics in Israel. Labelling is not always reliable, so cases of patients keep using preparations, which contain allergens are not rare.

We think that thimerosal sensitivity does exist in contact dermatitis patients and is not as irrelevant as current trends. To detect these cases, a careful evaluation is needed in thimerosal sensitive patients on patch tests.

References

1. Marks J G Jr, Belsito D V, DeLeo V A et al. North American Contact Dermatitis Group patch-test results, 1996–98. *Arch Dermatol* 2000; 136: 272–273.
2. Thompson T R, Belsito D V. Regional variation in prevalence and etiology of allergic contact dermatitis. *Am J Contact Dermat* 2002; 13: 177–182.
3. Trattner A, Farchi Y, David M. Cosmetics patch tests: first report from Israel. *Contact Dermatitis* 2002; 47: 180–181.
4. Wohrl S, Hemmer W, Focke M, Gotz M, Jarisch R. Patch testing in children, adults, and the elderly. influence of age and sex on sensitization patterns. *Pediatr Dermatol* 2003; 20: 119–123.
5. Schafer T, Bohler E, Ruhdorfer S et al. Epidemiology of contact allergy in adults. *Allergy* 2001; 56: 1192–1196.
6. Katsarou A, Lambrinopoulou K, Armenaka M. The positivity of thimerosal in Greece. *Contact Dermatitis* 1999; 41: 291–292.
7. Belsito D V. Thimerosal: contact (non) allergen of the year. *Am J Contact Dermat* 2002; 13: 1–2.
8. Suneja T, Belsito D V. Thimerosal in the detection of clinically relevant allergic contact reactions. *J Am Acad Dermatol* 2001; 45: 23–27.
9. Audicana M T, Munoz D, del Pozo M D, Fernandez E, Gastaminza G, Fernandez de Corres L. Allergic contact dermatitis from mercury antiseptics and derivatives: study protocol of tolerance to intramuscular injections of thimerosal. *Am J Contact Dermat* 2002; 13: 3–9.
10. Maouad M, Fleischer A B Jr, Sherertz E F, Feldman S R. Significance-prevalence index number: a reinterpretation and enhancement of data from the North American contact dermatitis group. *J Am Acad Dermatol* 1999; 41: 573–576.

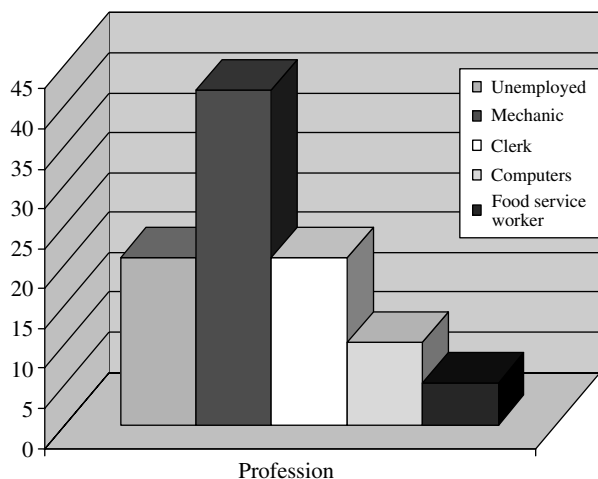


Fig. 1. Illustration of the high proportion of mechanics among thimerosal sensitive group. ($P < 0.0001$).

11. Freiman A, Al-Layali A, Sasseville D. Patch testing with thimerosal in a Canadian center: an 11-year experience. *Am J Contact Dermat* 2003; 14: 138–143.
12. Rietschel R L, Fowler J F (eds). *Fisher's Contact Dermatitis*, 5th edn. Baltimore: Lippincott Williams & Wilkins, 2001: 470.
13. Ockenfels H M, Seemann U, Goos M. Contact allergy in patients with periorbital eczema. an analysis of allergens. Data recorded by the Information Network of the Departments of Dermatology. *Dermatology* 1997; 195: 119–124.

Address:
Arieh Ingber
Department of Dermatology
Hadassah hospital
Ein-Kerem
Jerusalem
Israel
Tel: +972 2 6776366
Fax: +972 2 6426756
e-mail: gbds@netvision.net.il