

# Thimerosal Allergy

## *Is It a Concern?*

Peter Vadas, MD, PhD, FRCPC, FACP

Sensitization to thimerosal is commonplace in the general population. A large-scale North American study of allergic contact dermatitis found that thimerosal ranked among the 12 most common contact allergens. The study, which involved 3,120 patients, showed contact reactions to thimerosal occurred in 10.7% of patients.<sup>1</sup> European studies have reported comparable findings.

### *What is the mode of sensitization?*

Thimerosal is an organic, mercurial compound widely used as an antibacterial preservative in contact lens solutions, eye drops, and vaccines. Exposure to thimerosal by any of these routes has been associated with sensitization. Both immediate and, more commonly, delayed hypersensitivity reactions have been reported.

While thimerosal-induced keratoconjunctivitis is commonly seen in contact lens users, sensitization to thimerosal from vaccination probably surpasses that from contact lenses.

In a study done by Aberer, et al., thimerosal reactivity by patch testing was seen most frequently in children who had recently been immunized.<sup>2</sup>

Table 1

### Reactions to thimerosal-containing hepatitis B vaccines

- Persistent local reactions in the injection site
- Generalized urticaria
- Generalized exanthematous eruptions
- Urticaria with asthma

The concomitant presence of atopic dermatitis may be a risk factor for thimerosal sensitization, although this is not a universal observation.

### *What are the effects of thimerosal-containing vaccines in sensitized individuals?*

Most reports of adverse immunologic reactions to thimerosal in vaccines involve small numbers of patients. Consequently, the spectrum of adverse clinical reactions may be deduced, but true risk of reaction in sensitized individuals is difficult to estimate.

Reactions to thimerosal-containing hepatitis B vaccines, for instance, have various manifestations (Table 1).

## What do the studies show?

### *Audicana, et al. (2002)*

- In a recent study of the tolerance to thimerosal injection, 57 patients with positive patch tests to thimerosal were studied by intradermal tests and intramuscular challenge with thimerosal.
- Positive intradermal reactions were seen in 24 patients.
- Intramuscular injection of thimerosal induced a mild, local reaction in only five patients (*i.e.*, 9 % of thimerosal-positive reactions).<sup>3</sup>

### *Patrizi, et al. (1999)*

- Five infants with atopic dermatitis and positive patch tests to thimerosal received mandatory vaccinations with vaccines containing thimerosal.
- All five patients experienced exacerbations in their eczema two to 10 days after immunization.
- Nummular eczema developed on the trunk, limbs, and face.
- Despite thimerosal sensitization, all five children completed the entire series of vaccinations over the course of two years.<sup>4</sup>

### *Aberer, et al. (1991)*

- In a retrospective study of 50 thimerosal-sensitized patients, two reported “massive” local reactions following immunization.
- 12 thimerosal-sensitized individuals received followup immunizations and no side-effects occurred.<sup>2</sup>

### *Forstrom, et al. (1980)*

- 45 thimerosal-allergic individuals consented to subcutaneous injections of 0.5 mL of 0.01% thimerosal solution (*i.e.*, equivalent to the amount given with a standard dose of tetanus toxoid).
- Nine of the 45 individuals developed a local reaction at the injection site and one patient developed a generalized eczematous eruption with fever (*i.e.*, eczema vaccinatum reaction).<sup>5</sup>

These studies must be interpreted with caution because the sample sizes were invariably small and the studies did not have sufficient power to assign true relative risk values. **Dx**

**Dr. Vadas** is an associate professor, University of Toronto, and the director, division of allergy and clinical immunology, St. Michael's Hospital, Toronto, Ontario.



## Take-home message



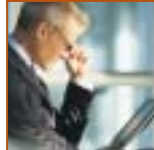
### What do we need to know?

- Rates of thimerosal sensitization range from 4.2% to 16.3%.
- Sensitization to thimerosal most often leads to delayed reactions, but immediate manifestations have also been reported.
- While positive patch tests and, possibly, positive intradermal tests to thimerosal are risk factors, these tests are poor predictors of the likelihood of reaction to thimerosal-containing vaccines.
- Most individuals with demonstrable sensitization to thimerosal tolerate thimerosal-containing vaccines with no untoward reactions, although some experience reactions ranging from mild to serious.

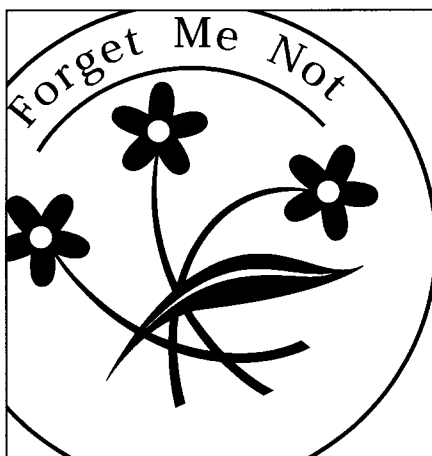
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