Egg allergy and MMR vaccine: New recommendations from the National Advisory Committee on Immunization

The fourth edition of the Canadian Immunization Guide (1993) recommends that “persons who have a history of anaphylactic hypersensitivity to hens' eggs (urticaria, swelling of the mouth and throat, difficulty in breathing or hypotension) should not be given measles vaccine except under special precautions”. The precautions outlined include skin testing with diluted vaccine and graded-challenge vaccination if the skin test is positive. Results of several recent studies have questioned such a cautious approach. The National Advisory Committee on Immunization (NACI) has reviewed all available data and revised its guidelines accordingly. The following revised guidelines are a major departure from the previously published recommendations. They will appear in the next edition of the Canadian Immunization Guide.

A measles-rubella combination vaccine (Mo-Ru Viraten Berna, Switzerland) recently licensed in Canada contains no avian proteins and therefore can be used without regard to egg allergy.

Vaccines that contain small quantities of egg protein can cause hypersensitivity reactions in some people with egg allergy. Adverse reactions are more likely with vaccines, such as yellow fever and influenza vaccines, that are grown in embryonated eggs. In contrast, measles and mumps vaccine viruses, which are most widely used in Canada, are grown in chick-embryo cell culture. Even after extensive purification, final vaccine products may contain trace quantities of avian proteins resembling proteins present in hens' eggs (1,2).

Anaphylaxis after administering measles-containing vaccines is rare and has been reported in individuals with anaphylactic hypersensitivity to eggs as well as those with no history of egg allergy. In some of these instances, allergy to neomycin (3,4) or gelatin (5) was hypothesized but, in most cases, no allergen was identified (6-8).

Because of rare anaphylactic reactions after measles-containing vaccines, NACI had recommended that measles-mumps-rubella (MMR) skin testing be performed in individuals with anaphylactic hypersensitivity to eggs. Recent studies have raised questions about the usefulness of and a rationale for these recommendations. These studies have reported uneventful routine MMR immunization in egg-allergic individuals (8-11) and in those with positive MMR skin tests (12). Others have reported occasional adverse reactions despite the use of MMR skin testing and graded challenge (13-15). In a Canadian study, 500 egg-allergic children including 33 with respiratory distress associated with egg ingestion were safely immunized. Skin testing was abandoned after the first 120 children because of its lack of predictiveness (16). Most recently, 54 children with egg allergy, including three with positive MMR skin tests, were routinely immunized without problem (17).

In reviewing the literature, these investigators calculated that over 1200 individuals with egg allergy have been assessed for measles immunization. None of the 284 children with egg allergy confirmed by blinded food challenge had any problem with routine measles immunization (95% CI 99.0% to 100%). Routine immunization was tolerated in all of 1209 children with positive skin tests for egg allergy (95% CI 99.75% to 100%) and in 1225 of 1227 (99.84%) children with histories of egg allergy (95% CI 99.41% to 99.98%). In addition, 38 anaphylac-
tic reactions after measles immunization have been reported in the literature in individuals without a history of egg allergy; MMR skin tests were positive in only four of the nine (44.4%) individuals tested. (17).

RECOMMENDATIONS

In view of the cumulative data indicating the safety of measles immunization in individuals with a history of anaphylactic hypersensitivity to hens' eggs and the lack of evidence of the predictive value of MMR skin testing, NACI has revised its recommendations for MMR immunization of individuals allergic to eggs as follows:

- As previously recommended by NACI, all immunizations should be administered by persons capable of managing vaccine-associated adverse reactions such as anaphylaxis and should take place in appropriate facilities.

- Egg allergy is not a contraindication to immunization with MMR. In individuals with histories of anaphylactic hypersensitivity to hens' eggs (urticaria, swelling of the mouth and throat, difficulty breathing or hypotension), measles immunization can be administered in the routine manner without prior skin testing. However, immunization should take place where adequate facilities are available to manage anaphylaxis. Persons at risk should be observed for 30 mins after immunization for any signs of allergic reaction. No special precautions are necessary for children with minor egg hypersensitivity, which permits uneventful ingestion of small quantities of egg, or when measles-rubella vaccine free of avian proteins is used. No special measures are necessary in children who have never been fed eggs before MMR immunization. Prior egg ingestion should not be a prerequisite for MMR immunization.

- Measles vaccine (or MMR) is contraindicated in individuals with a previous anaphylactic reaction to a measles-containing vaccine. If there is a compelling reason to re-immunize an individual who has had a prior anaphylactic reaction to measles vaccine, MMR skin testing and graded challenge in an appropriately equipped facility can be considered. However, the possibility of a hypersensitivity reaction to the MMR skin test or during the graded challenge must be considered.

- Surveillance for post measles vaccine anaphylaxis should be improved and prospective studies should be initiated to better define the risk in individuals with egg allergy.

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