

Food Allergens and Blood Transfusions: A Cause for Concern?

The case report of a 60-year-old man acquiring a nut allergy via liver transplant is concerning. This man received his new organ from an unfortunate 15-year-old boy who died as a result of ingesting peanuts, to which he was fatally allergic.¹ This raises a concern about screening a more ordinary allograft: blood transfusions.

Current blood donor guidelines do not include a dietary history for the most allergic foods such as fish, nuts, peanuts, shellfish, and wheat in adults and egg, fish, milk, peanuts, and soy in infants and children.² Blood transfusion-induced reactions do occur.³ One major tertiary care facility reported an overall transfusion reaction rate of 2.1%.⁴

The suspicion that food allergens can be culpable has its origin from an article published in 1942.⁵ At that time, one medical treatment of hyperemesis gravidarum included injections of blood from the patient's husband. Hughes and Martin⁵ describe a woman with a medical history that included severe migraines 6 to 8 hours after ingesting coffee, chocolate, peas, maple syrup, cow's milk, cream, and paprika. Paprika produced the most severe reaction of pulmonary edema, occurring on 3 occasions. When this woman became pregnant and experienced hyperemesis, she was treated with injections of her husband's blood. She then began having recurrence of migraines, which paralleled those of her food intolerances. It was discovered the husband periodically ate some of the foods to which she was sensitive, thus triggering a severe headache that followed the injection of his blood within 2 or 3 hours. The husband subsequently discontinued eating the aforementioned foods before the blood therapy was scheduled, and no further incidences were noted.

Food allergies are increasing, especially sensitivities to peanuts (notably among children), which rose to 3.3% from 1.1% as reported in 1989.⁶ It is interesting to speculate whether adverse reactions after blood transfusions will increase as donors incorporate more nuts and fish into dietary patterns for heart health and weight loss reasons.^{7,8} From a public health perspective, would it be worth investigating sera for fish, shellfish, peanuts, eggs, wheat, soy, and milk allergens to ascertain whether donor blood could vector potentially sensitive dietary components to predisposed persons? There may be a difference of potency with the passage of time. Twenty-four hours after ingestion of a potential allergen may be a concern, whereas 72 hours may not be. If sera is noted to be positive for allergens, the solution would appear to be

relatively simple: asking donors to abstain from consumption of the most allergenic foods prior to blood donation or labeling the product accordingly.

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Food Allergy: Preventing a Fatal Outcome

The case report by Phan et al¹ of transfer of nut allergy is interesting from the phenomenological standpoint and also serves as a haunting lesson in the proper management of patients with food allergy. It has been suggested that some transplantation drugs (tacrolimus) play an immunopathogenetic role in the development of food allergy by driving a T_H2 response.² It appears from this case as well that aggressive immunosuppression does not temper the clinical manifestations of anaphylaxis.

Aside from avoiding the sensitizing food, was the death of the donor otherwise preventable? This child had at least one, if not both, of the 2 main risk factors implicated in fatal food anaphylaxis: delay in administration of epinephrine and poorly controlled asthma.³ The recipient likewise had anaphylaxis with hypotension, yet did not initially receive epinephrine.

In my own experience, epinephrine is often omitted from the emergency care of the anaphylactic patient. Pumphrey⁴ reported that epinephrine was administered in 62% of the fatal anaphylactic reactions that he reviewed, with only a small minority (14%) receiving the drug before cardiac arrest. In the same review, he found that only 3 of 164 case fatalities were actually due to epinephrine overdose that far exceeded standard protocol for anaphylaxis.