

## REFERENCES

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## “Heparin Allergy” and Cardiopulmonary Bypass

*To the Editor:*

Our Cardiac Anesthesia Service was recently involved in the care of a woman presenting for emergent myocardial revascularization. In addition to a number of more common medical problems, the patient had a well-documented history of clinical anaphylaxis and shock following prior exposure to heparin years earlier for the treatment of deep venous thrombosis. These reactions are extremely rare and are believed to be due to either the heparin compound itself or the preservative, chlorocresol, used in the formulation. Antibodies can be developed to each of the two types of heparin available, bovine or porcine. Antigenic testing and immunodiffusion studies may be used to define the exact allergen but these were impossible on this emergent basis.<sup>1,2</sup> The planned surgical procedure required full cardiopulmonary bypass, hence complete systemic anticoagulation. The newer low molecular weight heparin formulation was not available on such short notice, and, therefore, the administration of a full dose of regular heparin was required. Fortunately, the product currently in use in this institution does not contain chlorocresol as a preservative, thus eliminating this substance as a potential antigenic problem. Which type of heparin to use, bovine or porcine derived, remained an issue. After consultation with the Pharmacy Department, it was decided to use the pure beef extract because the patient's prior exposure would most likely have been to the porcine preparation. Using a derivative to which the individual has not been previously exposed may offer an advantage in such situations,<sup>2</sup> though this is controversial. The patient was premedicated with methylprednisolone, 125 mg, diphenhydramine, 50 mg, cimetidine, 300 mg, and an epinephrine infusion (5 µg/min) as prophylaxis prior to the administration of the bovine heparin. Then a 100 U test dose was given. No adverse response was evident and an anticoagulant dose (300 U/kg) was administered in incremental allotments. This was likewise uneventful and the rest of the procedure continued without incident.

The question as to whether this patient was truly allergic to porcine heparin or rather had experienced an anaphylactoid reaction to the preservative it was contained in could not be answered at the time she presented for emergency care. However, a very severe response had occurred upon previous exposure and efforts were made to avoid a recurrence. The patient was given a heparin formulation to which she had not been previously exposed (in this case bovine-derived heparin with a benzyl alcohol preservative), and premedication to ameliorate any reaction that might have still developed despite the antigen change. No problems were encountered. Which step was actually effective in preventing the adverse response is unknown, but a serious problem was avoided.

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## Commentary to Letter by J.G. Bray

*To the Editor:*

Dr Bray's experience raises several issues. First, do any currently marketed formulations of heparin use chlorocresol as preservative? All those listed in the 1992 Physicians' Desk Reference (Montvale, NJ: Medical Economics Data) use benzyl alcohol. Second, would a low molecular weight heparin (LWMH) compound have been a superior choice? Not likely. Cross-reactivity is not assured. Because skin tests yield many false positives, a provocative trial similar to the one Dr Bray describes with bovine heparin would probably have occurred with LWMH. Unfortunately, the anticoagulant effect of