

## Letters to the Editor

### Protamine Sulfate and NPH Insulin

#### TO THE EDITOR

I read with interest your recent article entitled, "The safety of protamine sulfate in diabetics undergoing cardiac catheterization" by Reed and Gascho at the University of Virginia [1]. Their study was entirely consistent with my own anecdotal experience over the years, which also was at odds with previous studies suggesting that protamine sulfate might be a dangerous drug to use in patients receiving NPH insulin [2-4].

Over the last 10 years or so in the performance of some 3,000 heart catheterizations, my experience had been to give virtually all of those people full systemic heparinization and to reverse it subsequently at the end of the procedure in all but a handful of patients. This was done without regard for any particular medications that the patient might be taking, specifically without regard for insulin or NPH insulin usage.

Over that period of time, I have utilized protamine sulfate in doses of exactly 50 mg given over 4-5 minutes to reverse systemic heparinization with 3,000 units as well as the additional heparin from the flush solution. In all but one, administration was entirely uneventful and without hypotension, breathing difficulties, rash, or any other systemic effects. One patient, after receiving 10 mg, had some mild itching and complained of mild shortness of breath so that the rest of the dose was not given. In every other patient, there were no untoward reactions, including dozens who have been on NPH insulin.

Over the past 6 months or so, because of continuing reports of the danger of protamine, I had begun to ask patients if they took

NPH insulin. I would then withhold protamine in those cases, even though the reports of danger have been at odds with my experience. In the patients who do not have the heparin reversed with protamine, there remains substantial prolongation of the partial thromboplastin time at the conclusion of the procedures.

I am very glad to have seen this report included in *Catheterization and Cardiovascular Diagnosis* as I am now comfortable resuming previous, apparently safe practices.

#### REFERENCES

1. Reed DC, Gascho JA: The safety of protamine sulfate in diabetics undergoing cardiac catheterization. *Cathet Cardiovasc Diagn* 14:19-23, 1988.
2. Cobb CA, Fung DL: Shock due to protamine hypersensitivity. *Surg Neurol* 17:245-246, 1981.
3. Stewart WJ, McSweeney SM, Kellett MA, Faxon DP, Ryan TJ: Increased risk of severe protamine reactions in NPH insulin dependent diabetics undergoing cardiac catheterization. *Circulation* 70:788-792, 1984.
4. Grossman W: Complications of Cardiac Catheterization: Incidents, Causes and Prevention. In Grossman W (ed): "Cardiac Catheterization Angiography." Philadelphia: Lea & Febiger, 1986, p. 39.

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### Protamine Exposure in Diabetics After Catheterization

#### TO THE EDITOR

The recent publication of the article "The safety of protamine sulfate in diabetics undergoing cardiac catheterization" by David Reed and Joseph Gascho [1] raises the question as to how far a physician should go to avoid potential catastrophe and what is an "acceptable" mortality for a procedure that is unnecessary. While I would agree that the incidence of reactions to protamine sulfate in diabetics is low, a death in refractory anaphylaxis of a 60-yr-old NPH insulin-receiving diabetic woman after 50 mg of protamine and a death in a 60-yr-old man immediately after receiving protamine after an electrophysiology test caused us to reevaluate our use of this agent. Diabetic patients who receive the protamine frequently have severe coronary disease, so that the marked hypotension from anaphylaxis can lead to myocardial infarction death in these high-risk patients. While we had only two fatal reactions during 10 yr, leading to a mortality of .02%, this is too high considering the lack of necessity for routine administration of this agent. By reducing our routine dose of heparin (from 5,000 units

to 2,500 units), by down-sizing our catheters, and by puncturing the femoral artery above the femoral bifurcation, we have been able to maintain good hemostasis after the procedure and in most cases avoid the use of protamine. We still administer the drug with great care to patients who continue to bleed, but our overall patient exposure is considerably reduced. Less than 1 in 100 patients now receive protamine in our laboratory.

#### REFERENCES

1. Reed DC, Gascho JA: The safety of protamine sulfate in diabetics undergoing cardiac catheterization. *Cathet Cardiovasc Diagn* 14:19-23, 1988.

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