Anaphylactoid Reactions during Hemodialysis on AN69 Membranes: Role of Ace Inhibitors and Back-Filtration

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Sir,

Recently, frequent anaphylactoid reactions (AR) have been reported in patients receiving angiotensin converting enzyme (ACE) inhibitors while on hemodialysis (HD) with polyacrylonitrile (AN69) dialyzers [1-6]. Tielemans et al. [1] suggested that ACE inhibitors potentiate the inflammatory response triggered by the interaction between blood and the AN69 polymer. They believe that AN69 membrane per se is involved in the pathogenesis of these AR, because their epidemiological data strongly suggest it [6]. Ver-resen et al. [2] observed that these AR did not take place during hemofiltration, so they suggest that these reactions are mediated by some bacterial products of the dialysate that crosses this membrane by back-filtration. In relation to this controversy, we had an experience in a single patient who was on hemodiafiltration (HDF) with a high-flux AN69, 1.6-m² dialyzer during 9 months, receiving an ACE inhibitor, captopril 50 mg/day, and with acetate as dialysate buffer. She was shifted to HD with the same dialyzer and bicarbonate as dialysate buffer, and in the first and second HD sessions, she developed a swelling of the face, edema of the mucosae of the eyes, lips and tongue and hypotension with vomiting; symptoms occurred immediately after the initiation of the dialytic procedure. There were no other changes in the treatment. Since then, she has been dialyzed using a dialyzer of Cuprammonium rayon, sterilized with autoclave, with bicarbonate as dialysate buffer; captopril was continued without any further AR. We had 2 of 16 patients on acetate-free biofiltration, with AN69 dialyzers, receiving ACE inhibitors, and no adverse reaction has ever been noted. We have observed similar AR in 4 other patients with AN69 dialyzers on HD (total = 12); they were shifted to polysulfone (PSF) or cellulose-triacetate (CTA), high-flux dialyzers, and no further episodes were observed. After these AR, patients had normal peripheral eosinophil counts, in contrast to some other adverse reactions described before [7]. In our dialysis unit, there are 23 patients on HD with PSF or CTA free of AR. In spite of Jadoul et al. [3] reporting AR in a patient within 5 min of isolated ultrafiltration in 5 of 11 sessions, we believe that this type of AR during HD is partially dependent of back-filtration. We think that this type of adverse reactions become symptomatic when several factors appear together: AN 69, dialysate toxins, back-filtration, ACE inhibitors.

Our findings indicate that ACE inhibitors may increase anaphylaxis during HD using AN69 membranes, probably by magnification of back-filtration reaction. These AR can be avoided by either shifting to HDF or to PSF-CTA high-flux dialyzers.

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