Captopril, Proteinuria and Peritoneal Protein Leakage in Diabetic Patients

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Dear Sir,

Several authors have noted a decrease in proteinuria in patients with diabetic nephropathy receiving captopril [1, 2]. This effect has been ascribed to glomerular hemodynamic changes caused by the blocking of angiotensin II efferent arteriole receptors, together with improved blood pressure control. However, it is possible that angiotensin-converting enzyme blockers could improve proteinuria through other mechanisms, such as modification of vessel wall permeability.

Diabetic patients included in our continuous ambulatory peritoneal dialysis program during the first months of dialysis showed an important peritoneal protein loss which declined progressively with time when stabilization of blood glucose [3] and/or blood pressure was obtained, as it occurs in diabetic nephropathy where proteinuria is lowered by strict metabolic control [4]. These patients offer an *in vivo* experimental model for the study of protein leakage in two different vascular systems: (1) the capillaries of the glomerular tuft, influenced by changes in hydrostatic pressure secondary to blood pressure *per se* and by the action of angiotensin II on efferent arterioles and (2) peritoneal cavity vessels, representatives of normal capillaries without efferent arterioles, and thereby affected principally by blood pressure.

We studied proteinuria in 12 diabetic patients who received captopril for a 4-week period before starting on continuous ambulatory peritoneal dialysis. In 9 of these patients, upon starting peritoneal dialysis, captopril therapy was interrupted for a 4-week period, after which it was reintroduced for a similar period. The patients received no other antihypertensive agent during the period of study. Mean doses of captopril were 50 mg/day. Peritoneal protein leakage was evaluated both with and without associated captopril therapy.

Both proteinuria and peritoneal protein leakage were reduced with the low doses of captopril. Proteinuria was lowered from 4.54 ± 2.9 g/day precaptopril to 2.9 ± 1.59 g/day with captopril ($p < 0.01$) without changes in serum creatinine or blood pressure. Peritoneal protein leakage decreased from 7.6 ± 3.0 g/day precaptopril to 4.0 ± 1.7 g/day with captopril ($p < 0.05$) with a small decrement in mean blood pressure. Two patients included in the study whose blood pressure actually increased also showed reduced protein losses.

These data support the hypothesis that captopril could be exerting a proteinuria-reducing effect through additional mechanisms and not only by lowering blood pressure and acting on angiotensin

J₁-efferent arteriole receptors. Possibly, captopril therapy could be decreasing capillary permeability, either by a direct action of the drug or indirectly, mediated by angiotensin II, prostaglandins or kinins.

References

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