Antiproteinuric Effect of Captopril in Primary Glomerular Disease

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Dear Sir,

The favorable effect of captopril on the evolution of glomerular disease, and particularly on proteinuria levels, was first described in this journal by Herlitz et al. [3] in systemic lupus erythematosus patients with an advanced stage of glomerulonephritis (hypertension and renal failure). Optimal control of hypertension was achieved; renal function improved in 64% of patients on long-term therapy and mean proteinuria decreased from 4.5 g/day before captopril to 2.7 g/day after captopril treatment.

More recently, Taguma et al. [7] reported the antiproteinuric effect of captopril in patients with advanced diabetic nephropathy. They found a significant difference between pre- and posttreatment values in their 10 patients: a frank decrease in proteinuria (more than 60%) was present in 6 out of the 10 patients; the difference was small or absent in the 4 others, suggesting heterogeneity in the response to captopril.

For 18 months, we have given captopril in primary glomerular diseases (PGD) after the fortuitous observation of a decrease in proteinuria in a patient treated by captopril for hypertension. Captopril was given for at least 6 months at a low dosage (25 mg twice a day) in 10 patients (8 M, 2 F; 36–63 years old: table I) with various types of chronic PGD and a permanent proteinuria of 3–23 years duration. Hypertension was present in all. Three had normal renal function (serum creatinine $< 130 \mu\text{mol/l}$) and 7 had moderate renal failure (serum creatinine from 140 to $220 \mu\text{mol/l}$). Captopril was associated with the previous antihypertensive treatment which remained unchanged. After 6 months of treatment with captopril, we observed an additional decrease of blood pressure and a more than 50% decrease in proteinuria in 7 of the 10 patients with PGD, with a complete disappearance in 4 patients. The mean proteinuria decreased significantly from $4.95 \pm 1.26 \text{ g/day}$ to 2.53 ± 1.03 ($p < 0.05$ with Wilcoxon's signed rank test, table II, fig. 1). Moreover, in 3 cases proteinuria returned quickly to initial levels after stopping captopril and decreased again when the drug was reintroduced. Except in 1 case, the creatinine levels remained unchanged. The kaliemia was not modified.

Thus, we observed an antiproteinuric effect similar to that described by Herlitz et al. [3] and by Taguma et al. [7]. In our cases, this effect appeared independent of the histological type of glomerulonephritis. It was seen after 1 month of treatment and lasted a minimum of 6 months as long captopril was administered. Therefore, captopril appears to be useful in patients with

hypertension and proteinuria. A frank reduction of proteinuria can be obtained with captopril in patients with PGD, in addition to the antihypertensive effect. This antiproteinuric action was not observed with other antihypertensive drugs. But a control study with a larger sample is needed to confirm this antiproteinuric effect of captopril and to define which patients could benefit from this treatment. The mechanism of its action is unknown and only speculative, i.e.: (1) inhibition of the hemodynamics changes, that, in

Table I. Clinical data on patients treated by captopril

MGN = Minimal changes glomerulonephritis; MPGN = membranoproliferative glomerulonephritis; FSGN = focal and segmental glomerulonephritis; IgA GN = mesangial IgA glomerulonephritis.

100

Laguerre/Robeva/Laurent

Table II. Biological data on patients treated by captopril before and after 6 months of captopril treatment

141

Fig. 1. Proteinuria before captopril and after 1 and 6 months of treatment (individual results).

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glomerular diseases, leads to ongoing parenchymal destruction, as recently demonstrated in chronic renal disease of partially nephrectomized rats [2]; (2) reduction of glomerular capillary hyperpermeability by decreasing the formation of angiotensin II; (3) anti-inflammatory action, because captopril is an antipeptidase and may suppress experimentally the increase in vascular permeability induced by histamine and by serotonin [4] (nonsteroidal anti-inflammatory drugs have antiproteinuric effects [5]; (4) Captopril also has antiplatelet effects [6] and antiplatelet agents have been used in glomerular diseases