Effect of Benidipine on Decreasing Glomerular Expansion in the Experimental Nephrotic Syndrome

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Table 1. Levels of Bowman's area and glomerular tuft area in normal (vehicle-treated), control (PAN-, PS-treated) and benidipine (PAN-, PS- and benidipine-treated) groups with the experimental nephrotic syndrome in rats (mean $\pm$ SE)

Dear Sir,

A study of the effect of benidipine on decreases in the glomerular expansion in the experimental nephrotic syndrome is described. Benidipine is a potent Ca channel blocker with long-lasting antihypertensive and antianginal activities [1]. Recently, Shi-rakura et al. [2] reported that the administration of benidipine to rats with the nephrotic syndrome resulted in lower blood urea nitrogen, serum creatinine and blood pressure, and higher creatinine clearance with less histological damage following the induction of the nephrotic syndrome. It is still unknown if Ca channel blockers specifically influence the dilatation of efferent arterioles in the kidneys specifically and reduce intraglomerular hypertension. Fifteen male Sprague-Dawley rats were used in this study. The nephrotic syndrome was induced by unilateral ne-phrectomy and injections of 10 mg/kg body weight of puromycin aminonucleoside administered subcutaneously and 25 mg/kg of protamine sulfate administered intravenously [2, 3]. Benidipine was suspended in distilled water to make a suspension of 1 ml/100 g rat body weight and 3 mg/kg was orally administered once a day for 93 days. Measurements of urinary protein or albumin were performed using an autoanalyzer. Fifty cortical glomeruli from each specimen stained with periodic acid-Schiff were examined. Measurements of Bowman's area and glomerular tuft area were performed with the semiautomatic image analysis system (IBAS, Carl Zeiss, Oberkochen, Germany) connected to a Zeiss photomicroscope. Outlines of the profiles, as viewed on a video monitor, were traced on a digitizing tablet at a magnification of 1,000. The glomerular tuft area was defined as the minimal convex polygon circumscribing all tuft components, i.e. capillaries, mesangium and podocytes. The levels of urinary protein or albumin in the benidipine group were significantly lower than those in the control group ($p < 0.05$, $p < 0.01$, respectively). The mean levels of Bowman's area in the normal group or benidipine group

were significantly lower than those in the control group ($p < 0.05$). The mean levels of glomerular tuft area in the benidipine group were significantly lower than those in the control group ($p < 0.05$). The mean levels of glomerular tuft area in the benidipine group were lower than those in the normal group, but there was no statistical significance (table 1). It appears that the treatment of benidipine may decrease the expansion of Bowman's area and glomerular tuft area and reduce the excretion of urinary protein in the experimental nephrotic syndrome

in rats. It is important to determine if treatment with benidipine might have preventive effects on human progressive glomerular diseases, including the nephrotic syndrome.

References

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