Role of vasoconstruction in renal blood flow alterations during lower urinary pathway obstruction

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Abstrak

ABSTRACT
Acute lower urinary pathway obstruction is accompanied by renal blood flow alteration and vasoconstriction. The vasoconstriction rate (VCR) provides a morphological tool for measuring the degree of vasoconstriction. The present study consisted of two parts: animal experiments and autopsy case examinations. The experimental work focused on the VCR in the renal arterial system of rabbits with complete unilateral ureteral ligation. At 6 hours after unilateral ureteral obstruction (UUO) in the rabbits, the VCR in the renal and arcuate arteries increased above normal, whereas the interlobular artery VCR remained unchanged. The non-obstructed kidney did not show any significant change in VCR. Blood flow measurements were performed after various time intervals: 15 min, 90 min, and 6 hours. The mal blood flow during UUO in the rabbits increased within minutes after ligation, peaking at 15 min and gradually decreased thereafter. At 6 hours after complete ligation of the ureter, the blood flow of the kidney was 64.6% of baseline. The contra lateral kidney blood flow decreased 13.6%. The glomerulli of the rabbits exhibited ischemic changes characterized by separation of the capillary lobules and shrinkage towards the vascular pole, eventually causing a fairly distended Bowman's space. At 6 hours, electron microscopic examinations revealed focal destruction of the intracellular reticulum with electron dense granule deposition in the tubeles. The non-obstructed kidney showed no changes in morphology from among about 2000 autopsy cases accumulated in 1977-1985 at the Department of Pathology, Nihon University School of Medicine, 5 cases were selected on the basis of clinical and pathological scrutinization to assess how renal arterial vasoconstriction might implicate the kidney in the presence of ureter obstruction as a result, it was found that the renal arterial system experienced vasoconstriction during the presence of lower ureteral obstruction, paralleling the procedure of direct stoppage of urinary flow.