

THE ATRIO-RENAL NEURAL REFLEX PLAYS A MAJOR ROLE IN NATRIURESIS
INDUCED BY LEFT ATRIAL DISTENSION
IN CONSCIOUS DOGS

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Summary

The role of atrio-renal neural reflex in the natriuresis induced by left atrial balloon inflation was investigated in conscious dogs. Female mongrel dogs were assigned randomly to 1) sham-operated (n=8), 2) renal-denervated (n=8) dogs. The dogs were chronically instrumented with a bipolar stainless steel wire electrode for measurement of renal sympathetic nerve activity (RSNA), three catheters for measuring systemic arterial, central venous, and left atrial (Pla) pressures, and a balloon catheter for raising Pla. Balloon inflation induced a step increase in Pla by 7.7 ± 1.7 mmHg, a step decrease in RSNA ($-66.6 \pm 5.5\%$) and concomitant increases in urine flow ($441 \pm 142\%$), osmolal excretion ($60 \pm 12\%$) and sodium excretion ($300 \pm 69\%$) in sham-operated dogs. The reduction of RSNA occurred over 1 hr of balloon inflation period in a non-adapting fashion. The time course of the changes in RSNA was well correlated inversely with that of the changes in sodium excretion throughout the experiment. Renal-denervation abolished the diuresis and natriuresis during balloon inflation. This suggests that sustained reduction of RSNA is involved in natriuresis induced by the left atrial distension. It is concluded that a sustained reduction of RSNA originating from left atrial mechanoreceptors plays a major role in the natriuresis during left atrial distension in conscious dogs.