

**Elevated Plasma Concentrations of Symmetrical dimethylarginine (SDMA)
and
Asymmetrical Dimethylarginine**

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Purpose: Elevated plasma concentrations of symmetrical dimethylarginine (SDMA) and asymmetrical dimethylarginine (ADMA) are repeatedly associated with kidney failure and both can be excreted in urine. Current literature asserts that a loss of renal elimination in kidney failure is responsible for the elevated ADMA & SDMA levels. We tested whether renal excretion is necessary for maintenance of plasma ADMA and SDMA using three procedures to alter renal function.

Methods: Sprague-Dawley rats underwent either sham operation, bilateral nephrectomy, ureteral ligation, or ureteral section under isoflurane anesthesia. Tail-snip blood samples (250 μ L) were taken before and at 6 or 12h intervals for 72h after operation. High performance liquid chromatography determined SDMA and ADMA concentrations. Sodium, potassium, creatinine, blood urea nitrogen (BUN) and body weight were also assessed.

Results: SDMA increased 25 times (0.23 \pm 0.03 to 5.68 \pm 0.30 μ M) while ADMA decreased (1.17 \pm 0.08 to 0.73 \pm 0.08 μ M) following nephrectomy. There was approximately 50% reduction of plasma ADMA in 48h was due to either bilateral nephrectomy or ligation however plasma ADMA was maintained in rats undergoing bilateral ureteral section. Creatinine and BUN increased and paralleled SDMA following nephrectomy. Sham animals showed no significant changes in either ADMA or SDMA.

Conclusions: Increased SDMA confirms continuous systemic production of SDMA and its obligatory renal excretion much like creatinine. In contrast, decreased plasma ADMA suggests that acute total nephrectomy alters systemic ADMA metabolism or that kidneys preferentially contribute to systemic ADMA production. Thus renal function is needed for SDMA elimination but not needed for ADMA elimination.

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