ACUTE KIDNEY INJURY

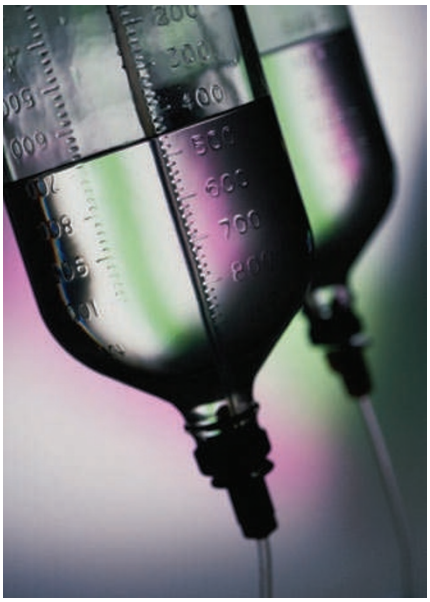
Is vasopressin more useful than norepinephrine in septic shock?

Patients with sepsis are at high risk of acute kidney injury (AKI) and death, but the current approaches to preventing or decreasing AKI-associated mortality in this patient population are of limited efficacy. A *post hoc* analysis of a randomized, controlled trial by Anthony Gordon and colleagues has led these researchers to hypothesize that patients with septic shock treated with vasopressin are at decreased risk of AKI and death compared with their counterparts treated with norepinephrine.

Evidence suggests that administration of the potent vasoconstrictor vasopressin to patients in septic shock increases glomerular filtration rate, urine output, and creatinine clearance. Gordon *et al.* analyzed data from a multicenter, double-blind, randomized, controlled trial that compared the effects of vasopressin to norepinephrine in patients with septic shock. The study defined septic shock as the presence of proven or suspected infection, incident dysfunction of at least one organ, and hypotension despite fluid resuscitation requiring vasopressor support (≥5 μg/min of norepinephrine or equivalent) for 6 h. At baseline, the 779 qualifying patients required a mean norepinephrine dose of 20.7 μg/min. Patients were classified according to the RIFLE criteria for AKI as being at 'non-risk', at 'Risk', with 'Injury', with kidney 'Failure', with 'Loss' of kidney function, or with 'End-stage' renal disease, and randomly assigned to receive vasopressin (0.01–0.03 U/min) or norepinephrine (5–15 μg/min).

As the analysis by Gordon *et al.* involved multiple simultaneous comparisons of patients in five different categories (no patients qualified for the 'Loss' category), $P = 0.01$ was set as the threshold for statistical significance. A trend ($P = 0.03$) was observed that at 'Risk' patients treated with vasopressin ($n = 52$) were less likely to progress to 'Failure' or 'Loss' over the 28-day study period than their counterparts ($n = 53$) treated with norepinephrine (20.8% versus 39.6%). Mortality was significantly lower among at 'Risk' patients treated with vasopressin than among those treated with norepinephrine (30.8% versus 54.7%, $P = 0.01$), although this difference was no longer significant after adjusting for baseline characteristics (odds ratio 0.33; $P = 0.02$). No differences were found regarding outcomes in patients in all other RIFLE categories.

Patients treated with vasopressin had significantly lower infusion rates of norepinephrine than their norepinephrine-treated counterparts, so Gordon *et al.* caution that the observed effects in patients treated with vasopressin may actually be caused by a reduction of the detrimental effects of norepinephrine. The researchers suggest, however, that if vasopressin is indeed beneficial in treating patients with septic shock, this effect may occur before substantial kidney failure has developed.



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Original article Gordon, A. C. *et al.* The effects of vasopressin on acute kidney injury in septic shock. *Intensive Care Med.* **36**, 83–91 (2010)