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# Dopamine vs. Norepinephrine in Treatment of Shock

*A large randomized trial shows no difference in death rates with the two agents overall but significantly higher mortality with dopamine among patients with cardiogenic shock.*

When fluid therapy is not successful in reversing a shock state, adrenergic agents are used, most commonly dopamine or norepinephrine. These agents differ in their modes of action, as they affect α-adrenergic and β-adrenergic receptors differently. Observational studies have shown higher death rates with dopamine than with norepinephrine in patients with shock; the few randomized trials to date have been too small to provide meaningful data.

In the current multicenter European study, 1679 adult patients with shock (signs of tissue hypoperfusion and systolic blood pressure <100 mm Hg or mean arterial pressure <70 mm Hg) that persisted after treatment with "adequate" fluids (at least 1000 mL of crystalloids or 500 mL of colloids) were randomized to receive dopamine or norepinephrine. Patients who had already received vasopressors for more than 4 hours were excluded. Treating physicians were blinded to drug assignment. Patients with hypovolemic shock, cardiogenic shock, and septic shock were included. The primary endpoint was the rate of death at 28 days. Secondary endpoints included time to hemodynamic stability and incidence of adverse events, such as serious arrhythmias and myocardial necrosis.

Rates of death at 28 days and times to hemodynamic stability did not differ significantly between the dopamine and norepinephrine groups. However, significantly more patients in the dopamine group than in the norepinephrine group experienced arrhythmias (24% vs. 12%). A predefined subgroup analysis according to type of shock showed that among 280 patients with cardiogenic shock, the death rate at 28 days was significantly higher in dopamine recipients than in norepinephrine recipients. An editorialist notes the relatively low amount of fluids considered by the investigators to be adequate to gauge response before starting vasopressors.

**Comment:** The authors "strongly challenge" the current American College of Cardiology–American Heart Association guidelines that recommend dopamine as a first-line agent for cardiogenic shock. In such cases, norepinephrine seems to be the prudent choice. No evidence supports one agent over the other for different forms of shock.

— ***J. Stephen Bohan, MD, MS, FACP, FACEP***

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