Shock Index Predicts Hypotension in Patients Induced with Ketamine

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An observational study confirms that ketamine can cause hypotension in catecholamine-depleted patients.

Ketamine causes catecholamine release, but when used for rapid sequence intubation (RSI), it generally does not have hemodynamically consequential effects. In a prospective observational study, investigators in Australia evaluated the hemodynamic effects of ketamine in patients undergoing RSI in the prehospital setting. They compared the effects between 81 patients with a pre-induction shock index (heart rate/systolic blood pressure) <0.9 (low shock index; LSI) and 31 patients with a pre-induction shock index ≥0.9 (high shock index; HSI). Vital signs were measured every 3 minutes up to 9 minutes after induction.

The total mean ketamine dose was 1.7 mg/kg in the HSI group and 2.0 mg/kg in the LSI group. Hypotension (systolic blood pressure <90 mm Hg) developed in 26% of patients in the HSI group versus 2% of the LSI group. Systolic blood pressure increased by an average of 16 mm Hg in the LSI group. In the LSI group, pulse rate increased by 20 beats per minute (bpm) after induction and remained elevated, whereas in the HSI group, pulse rate increased significantly (by 15 bpm) only at the second post-induction measurement.

Comment: This study is consistent with our current understanding of ketamine’s effects on hemodynamics: It generally increases blood pressure and heart rate — due to catecholamine release — without clinical significance, but can cause hypotension in catecholamine-depleted patients. It is important to remember that all induction agents are, to varying degrees, negative inotropes and may cause some hypotension, depending on the clinical scenario. Ketamine is an excellent agent for induction in hemodynamically unstable patients, and, as for all agents, we should know the potential untoward consequences of its use and be prepared to manage them.

Citation(s):

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