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"Propofol or Ketofol for Procedural Sedation and Analgesia in Emergency Medicine – The POKER Study: A Randomized Double-Blind Clinical Trial."
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Clinical Question: Does use of a 1:1 combination of ketamine and propofol versus propofol alone for procedural sedation lead to fewer adverse respiratory events?

Background: Propofol and ketamine are two medications commonly used for procedural sedation in the emergency department, each coming with their own set of pros and cons. Propofol has amnestic and antiemetic properties, but it is associated with hypotension, hypoventilation, loss of airway reflexes, apnea, and hypoxia. Ketamine is a strong analgesic and allows the patient to maintain their airway reflexes, but it is associated with hypertension, vomiting, and emergence delirium. Combination ketamine and propfol, or ketofol, theoretically lowers the risk of adverse events by using lower doses of each while still achieving appropriate sedation/analgesia.

Methods: This was a randomized, double-blind clinical trial performed between April 2013 and April 2015 and included patients from 3 diverse hospitals in Australia. Patients 18 years of age and older were eligible. Patients were then randomized into either the propofol or ketofol study arms and given weight based dosing in titrated aliquots, with additional dosing at the sedating physician's discretion. Primary outcomes observed were occurrence of a respiratory event defined as hypoxia (SpO_2 <93%), hypoventilation (RR <8 breaths/min), apnea (no capnography trace for >15 seconds), laryngospasm, aspiration, or the occurrence of a "rescue intervention" (increased O_2 flow rate, airway repositioning or use of an airway adjunct, BVM ventilation, or intubation). Secondary outcomes measured were hypotension and patient satisfaction.

Results: 573 patients were enrolled, 281 in the ketofol group and 292 in the propofol group. In the ketofol group, 3% met the primary outcome with a respiratory event. In the propofol group, 5% met the primary outcome. This translates to a difference of only 2% between the two groups which was not statistically significant per the study with a 10% cutoff. When considered individually, the rates of respiratory events were still similar in both groups with the exception of a slightly higher rate of BVM ventilation with propofol. Regarding secondary outcomes, there was a statistically significant higher rate of hypotension in the propofol group, but this was transient and responsive to a fluid bolus. Patient satisfaction scores were similarly high in both groups, though the ketofol group did report slightly higher analgesia at 30 minutes. Both groups had high rates of procedural success. The ketofol group experienced more emergence delirium and hallucinations, though the majority were minor and the hallucination were even described as "pleasant."

Conclusion: The authors report their study to be the largest study to compare ketofol in a 1:1 ratio in a single syringe with equivalent volumes of 1% propofol for ED procedural sedation. The two produced similar rates of adverse respiratory events. Limiting factors include the use of pre-procedural opiates, while titrated, were not standardized and could have confounded respiratory findings. Differing comfort levels and triggers for intervention between sedating physicians could also slightly confound results. Nonetheless, these results are consistent with other smaller single center studies showing no significant difference between propofol and ketofol from a respiratory standpoint. Ketofol did have less agitation during the procedure, and there was less hypotension in that group as well.