Abstract *(in English – Times New Roman 12 - max. one page)*

Title: Ketamine in cardiac surgery: a narrative review

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Objective:
This narrative review aims to synthesize current evidence regarding the perioperative use of ketamine and esketamine in adult cardiac surgery, focusing on their hemodynamic, analgesic, neuroprotective, and anti-inflammatory effects.

Background:
Cardiac surgery is associated with significant hemodynamic instability, systemic inflammation, and postoperative complications, including pain and delirium. Ketamine, a dissociative anesthetic with multimodal pharmacological properties, has regained interest in this context, particularly its S-enantiomer, esketamine.

Methods:
A literature search was conducted in MEDLINE (PubMed) up to June 2025, following PRISMA guidelines. Randomized controlled trials evaluating ketamine or esketamine in adult cardiac surgery were included. Data were extracted and analyzed qualitatively according to major clinical outcomes.

Results:
Ketamine consistently demonstrates beneficial effects on perioperative hemodynamic stability, reducing vasopressor requirements and preserving arterial pressure. It also exhibits opioid-sparing and antihyperalgesic properties, particularly when administered postoperatively as a continuous infusion or via patient-controlled analgesia. However, evidence regarding its neuroprotective and anti-inflammatory effects remains inconsistent, with conflicting results across studies. Similarly, its impact on secondary outcomes such as renal function, myocardial injury, and oxygenation is inconclusive. Esketamine appears promising due to its greater potency and tolerability, although data remain limited.

Conclusions:
Ketamine and esketamine may offer a favorable balance between hemodynamic stability and effective analgesia in cardiac surgery, especially when administered as continuous low-dose infusions. Nevertheless, heterogeneity in study designs limits definitive conclusions. Further large-scale, standardized randomized trials are required to define optimal protocols and clarify their role in routine clinical practice.

References:
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