The Efficacy and Safety of Ketamine for Perioperative Pain Management of Children Undergoing Surgical and Anesthetic Management. A Meta-analysis of Published Studies

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Background: Post-operative pain control is one of the most important challenges in the surgical setting and has a major impact on patients and on the health system.

Objectives: To determine the safety and efficacy of ketamine in perioperative pain management among children undergoing surgery.

Methods: Literature search involving the analgesic effect of ketamine was done. Nine studies were included. Primary outcomes were pain scales and time to request for first analgesic. Safety measured using adverse events such as post-operative nausea and vomiting (PONV), tachycardia, hallucination and agitation.

Results: There was a significant lower pain score among patient given ketamine compared to patients given control drugs or placebo. In terms of adverse events, there is significant difference in the incidence of tachycardia, whereas no significant differences in PONV, hallucination and agitation.

Medical Center										
	Ke	tamin	e	Control				Mean Difference	Mean Difference	Risk of Bias
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI	ABCDEFGH
Ayatollahi 2012	5.93	0.18	42	6.2	0.41	42	14.4%	-0.27 [-0.41, -0.13]	+	
Chen 2012	2	1	27	4	2	24	10.6%	-2.00 [-2.88, -1.12]		
Hasnain 2012	3.65	1	40	4.45	1	40	13.4%	-0.80 [-1.24, -0.36]		
Javid 2012	3.2	1.2	25	3.9	0.9	25	12.6%	-0.70 [-1.29, -0.11]		
Marcus 2000	4	1	40	5	1	40	13.4%	-1.00 [-1.44, -0.56]		
Min 2012	3.3	0.3	22	3.2	0.2	22	14.4%	0.10 [-0.05, 0.25]	+	44444
Mizrak 2010	2	1	30	5	1	30	13.1%	-3.00 [-3.51, -2.49]		99999999
Siddiqui 2013	1.9	1.9	25	4.2	3	25	7.8%	-2.30 [-3.69, -0.91]		
Total (95% CI)			251			248	100.0%	-1.14 [-1.71, -0.57]	◆	
Heterogeneity: Tau ² = 0.58; Chi ² = 175.19, df = 7 (P < 0.00001); l ² = 96%										
Test for overall effect: Z = 3.92 (P < 0.0001) -4 -2 U Z 4 Favours [Ketamine] Favours [control]										
<u>Risk of bias legend</u> (A) Random sequence	general	tion (se	election	hias)						

(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Overall Bias
(H) Other bias

Figure 1: Statistical Analysis for Pain Score

Conclusion: Ketamine is more effective compared to other pain medications in terms of pain score and has no statistical differences in terms of adverse events.

Recommendation: Comparative studies regarding use of ketamine versus other pain medications in the local setting can be considered in future researches.

Keywords: ketamine, post-operative pain, analgesia, pediatrics