

Analgesia strategy on cognitive impairment after spinal anesthesia in hip surgery: A meta-analysis

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Introduction

Previous studies have indicated no significant difference in the incidence of cognitive impairment between general anesthesia and spinal anesthesia for hip surgery. However, the debate between general and spinal anesthesia merely scratches the surface. Within spinal anesthesia, components like perioperative analgesia warrant consideration in optimizing strategies for geriatric patients. Hence, our study aims to analyze cognitive impairment incidence across various analgesia strategies as adjuncts to spinal anesthesia for hip surgery.

Methods

We systematically conducted a search on Pubmed and CENTRAL databases for randomized trials that investigated the incidence of cognitive impairment following hip surgery with spinal anesthesia. We compared the peri-operative analgesia strategy into superior and inferior analgesia if differences in pain intensity scores were found among treatment groups in the study. The primary outcome of this review was the occurrence of post-operative delirium (POD) within 7 days post-surgery and delayed neurocognitive recovery (DNCR), defined as cognitive impairment within the first 30 days after surgery.

Results

A systematic search yielded a total of 277 literature sources after removing duplicates. However, only 74 studies were included after the initial screening process. Subsequently, 61 studies were excluded after obtaining their full texts and yielded 13 studies comparing analgesia modalities.

Different analgesia modalities were used in each included study, with no consistency among them. Therefore, an analysis could not be performed for the comparison of analgesia modalities. Instead, we conducted an analysis comparing groups receiving superior analgesia to control or inferior analgesia. Our meta-analysis results showed that adequate analgesia administration could decrease the incidence of delirium, DNCR at 24 hours post-operatively, 72 hours, and 4-7 days post-operatively (See the table).

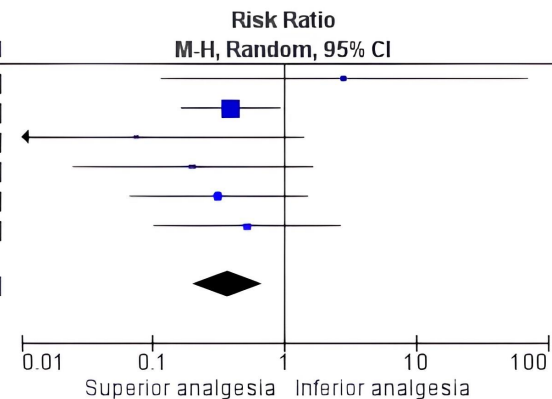
Conclusion

Optimizing perioperative analgesia are beneficial in reducing the risk of cognitive impairment in elderly patients undergoing hip surgery with spinal anesthesia.

Table

Pain improvement reduced the risk of delirium?			
Outcome	No. of Subjects	Effect of estimates	QOE
POD	6	RR 0.37 [0.20, 0.68], p < 0.05	MODERATE
DNCR at 24h	2	RR 0.63 [0.36, 0.91], p < 0.05	MODERATE
DNCR at 72h	2	RR 0.89 [0.08, 1.70], p < 0.05	LOW
DNCR at 4-7d	2	RR 0.30 [-0.04, 0.63], p = 0.08	MODERATE

Study or Subgroup	Superior analgesia		Inferior analgesia		Weight	Risk Ratio	
	Events	Total	Events	Total		M-H, Random, 95% CI	M-H, Random, 95% CI
Farlinger 2018	1	84	0	79	3.7%	2.82	[0.12, 68.31]
Hao 2019	6	43	15	42	52.6%	0.39	[0.17, 0.91]
Monzon 2010	0	92	4	62	4.5%	0.08	[0.00, 1.37]
Sakic 2023	1	30	5	30	8.6%	0.20	[0.02, 1.61]
Xu 2022	2	35	6	33	16.1%	0.31	[0.07, 1.45]
Yamamoto 2019	2	28	4	29	14.4%	0.52	[0.10, 2.61]
Total (95% CI)		312		275	100.0%	0.37	[0.20, 0.68]
Total events	12		34				
Heterogeneity: Tau ² = 0.00; Chi ² = 3.30, df = 5 (P = 0.65); I ² = 0%							
Test for overall effect: Z = 3.17 (P = 0.002)							



Forest plot for POD