

Efficacy of perineural dexamethasone in prolonging duration of analgesia with peripheral nerve blocks compared to intravenous dexamethasone: A systematic review and meta-analysis

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Abstract

Aim: Studies have demonstrated longer analgesia duration of peripheral nerve blocks with the addition of perineural dexamethasone compared to intravenous dexamethasone. However, these studies are underpowered to determine adequate effect size. Since the last published systematic review, more studies have emerged with conflicting results. This review aims to analyse the efficacy of perineural dexamethasone versus intravenous dexamethasone in prolonging the analgesic duration of peripheral nerve blocks for upper and lower limb surgeries.

Methodology: PubMed, Embase, Scopus, Cochrane Central Register of Controlled Trials, and ClinicalTrials.gov were searched. Inclusion criteria are randomised controlled trials (RCT) comparing use of perineural dexamethasone to intravenous dexamethasone in peripheral nerve limb blocks. Exclusion criteria are studies exclusively on blocks not intended for limb surgery, and studies that did not compare perineural and intravenous dexamethasone directly. Risk of bias was assessed with the revised Cochrane risk-of-bias tool.

Results: Sixteen RCTs (1467 cases; 738 perineural dexamethasone, 729 intravenous dexamethasone) met the eligibility criteria. Primary outcome was duration of analgesia, which was significantly longer in the perineural dexamethasone group compared to the intravenous dexamethasone group (mean difference (95% CI) 2.72 hours (1.42, 4.01), moderate quality evidence, $p < 0.0001$). Perineural dexamethasone also resulted in a longer duration of sensory block (MD(95% CI) 3.45h (1.36, 5.54), $p = 0.001$) and lower 24-hour postoperative pain scores (MD(95% CI) -0.74 (-1.40, -0.07), $p = 0.03$). There were no significant differences in duration of motor block (MD(95% CI) 2.01h (-0.92, 4.94), $p = 0.18$) and 24-hour oral morphine equivalent requirements (MD(95% CI) -1.05mg (-2.71, 0.61), $p = 0.21$). Although both groups reported cases of postoperative paraesthesia, the causal relationship between block performance and incidence of paraesthesia is uncertain.

Conclusion: This review further confirms the increased efficacy of perineural dexamethasone compared to intravenous dexamethasone in prolonging analgesia duration of peripheral nerve blocks.

However, the extent of block prolongation is small and may not represent a clinically meaningful difference.