

Does adding corticosteroids to the cocktail solution for Local Infiltration Analgesia in TKA minimise knee inflammation? A randomised controlled trial

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INTRODUCTION: Adding corticosteroids to the cocktail solution for local infiltration analgesia (C-LIA) in total knee arthroplasty (TKA) has been shown to decrease postoperative pain and accelerate functional recovery. While most studies on C-LIA have focused on improving clinical outcomes, there have been limited investigations evaluating changes in knee inflammation associated with C-LIA. We compared changes in synovial fluid proinflammatory cytokines and knee inflammation parameters between patients undergoing total knee arthroplasty (TKA) who received C-LIA and those who received corticosteroid-free LIA (CF-LIA).

METHODS: 100 patients with late-stage knee osteoarthritis undergoing unilateral primary TKA were randomised to receive intraoperative CF-LIA and C-LIA. The CF-LIA mixture consisted of 20 mL of 0.5% bupivacaine, 0.3 mL of 1:1000 adrenaline, 30 mg of ketorolac, and 0.9% saline solution, for a final volume of 40 mL. The C-LIA mixture consisted of similar agents with an additional 40 mg of Solumedrol. The baseline synovial fluid (SF) was collected at surgery, and subsequent SF samples were collected on postoperative day 3 (POD3) in all patients. They were analyzed for proinflammatory and inflammatory cytokines, including IL-1 β , IL-2, IL-4, IL-6, IL-8, IL-10, IL-12p70, IL-17 α , IP-10, TNF- α , TGF- β 1, MCP-1, and IFN- γ . Knee inflammation parameters, including VAS for pain, skin temperature, and range of motion, were recorded at preoperative, 6 hours, 12 hours, 24 hours, 48 hours, and 72 hours postoperatively and analyzed between the two groups.

RESULTS: There were 50 patients in each group. The mean ages of the C-LIA and CF-LIA groups were 67.8 years and 67.0 years, respectively ($p = 0.81$), with a predominance of females in both groups. There were no perioperative complications, and all patients were ambulated and discharged according to the 3-day protocol. Regarding changes in cytokine levels between baseline and POD3, there was a significant increase in the levels of IL-1 β , IL-6, IL-17 α , TNF- α , and MCP-1 in both C-LIA and CF-LIA groups. However, there were no significant differences in the changes in all cytokines between the two groups. All knee inflammation parameters were not significantly different between the two groups at preoperative and postoperative records.

DISCUSSION AND CONCLUSION: The significant increase in the levels of inflammatory cytokines in synovial fluid confirmed the inflammation after TKA in both C-LIA and CF-LIA groups. However, although studies have shown that adding corticosteroids to the cocktail solution decreases postoperative pain and accelerates functional recovery, the present study found that it did not minimize the level of knee inflammation.