A Comparison of Intraoperative Epidural Analgesia and Intraoperative Periarticular Injection on Pain Control Following Total Knee Arthroplasty

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BACKGROUND

Analgesia following total knee arthroplasty (TKA) is usually multi-modal and involves the use of intravenous opioids, peripheral nerve block, epidural analgesia, injection of opioid or local anesthetics into joint or synovial fluid, plus the use of oral analgesics. Although there is no consensus yet on what the gold standard for postoperative pain is, there has been a tendency toward multi-modal approaches with regional anesthesia to minimize opioid consumption and to avoid side effects associated with opioids.

We aimed to compare the effect of epidural morphine analgesia and periarticular injection on postoperative pain, analgesic consumption, and the early period range of motion (ROM) following TKA.

METHODS

This single-center, prospective, randomized-controlled, and double-blind study included a total of 80 patients who were older than 18 years old and underwent unilateral TKA with a knee prosthesis due to primary varus knee osteoarthritis. All patients received a combined epidural spinal anesthesia.

Group P (n=40): A cocktail of 100mL (bupivacaine, adrenaline, dexmedetomidine, magnesium sulfate, methylprednisolone, morphine and normal saline) was administered to the knee joint.

Group E (n=40): A total of 10 mL solution containing 3 mg morphine (3 mL) and normal saline was administered from the epidural catheter.

All patients received postoperative analgesia with an epidural patient-controlled device and the consumption of bupivacaine + fentanil solution was recorded for 48 hours. The maximum ROM, functional status, visual analog scale (VAS), and dynamic visual analog scale (DVAS) were assessed.

RESULTS

24 and 27 patients were analyzed statistically in Groups P and E respectively. Lower VAS and DVAS scores at 48 hours, lower amounts of consumed analgesics at the 24th and 48th hours, higher ROM values on the 2nd and 3rd days, and more nausea, vomiting and itching at the 12th and 24th hours were observed significantly in Group P (Table I, Figure I).

Keywords: Total Knee Arthroplasty, Periarticular Injection, Epidural Analgesia, Pain

References:

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Table I: Range of motion according to groups [mean ± Standard deviation]

	Group P (n=24)	Group E (n=27)	P
ROM 1st day	96.04±13.18	100.56±13.61	0.236
ROM 2nd day	103.33±13.40	100.93±10.83	0.001*
ROM 3th day	107.08±9.43	104.07±10.09	0.002*

ROM: range of motion *p<0.05

Figure I: Mean values of Visual Analogue Scale (VAS) according to groups

*p<0.05

CONCLUSIONS

Our study results show that as postoperative analgesia in TKA, a periarticular injection with bupivacaine, adrenalin, dexmedetomidine, magnesium sulphate, metylprednisolone, morphine and normal saline provides less complications, plus improves pain control and ROM, compared with epidural morphine analgesia. Therefore, we suggest that this periarticular injection of multiple drugs is an effective and safe method for postoperative analgesia in TKA.