



## Review

# Comparison of intrathecal and local infiltration analgesia by morphine for pain management in total knee and hip arthroplasty: A meta-analysis of randomized controlled trial



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## H I G H L I G H T S

- To evaluate the efficiency between local infiltration and intrathecal morphine for pain control in TKA and THA.
- Local infiltration provided superior analgesia effects within the first 24 h following TKA and THA.

## A R T I C L E I N F O

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## A B S T R A C T

**Objective:** We performed a meta-analysis from randomized controlled trials to evaluate the efficiency and safety between local infiltration analgesia and intrathecal morphine for pain control in total knee and hip arthroplasty.

**Methods:** We systemically searched electronic databases including Embase (1980–2016.7), Medline (1966–2016.7), PubMed (1966–2016.7), ScienceDirect (1985–2016.7), web of science (1950–2016.7) and Cochrane Library for relevant articles. All calculation was carried out by Stata 11.0.

**Results:** Four randomized controlled trials (RCTs) involving 242 patients met the inclusion criteria. The meta-analysis showed that there were significant differences in terms of postoperative pain scores at 24 h during rest ( $P = 0.008$ ) and mobilization ( $P = 0.049$ ) following total knee and hip arthroplasty. Significant difference was found regarding the incidence of nausea ( $P = 0.030$ ), vomiting ( $P = 0.005$ ), and pruritus ( $P = 0.000$ ) between two groups. There was no significant difference between groups in terms of morphine equivalent consumption at postoperative 24 or 48 h.

**Conclusions:** Local infiltration analgesia (LIA) provided superior analgesic effects within the first 24 h compared to intrathecal morphine (ITM) following total knee and hip arthroplasty. There were fewer adverse effects in LIA. Doses of morphine consumption were similar in the two groups.

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## 1. Introduction

Total knee arthroplasty (TKA) or total hip arthroplasty (THA) are considered effective procedures for the treatment of the degenerative arthritis, rheumatoid arthritis and traumatic injuries such as displaced femoral neck fractures [1]. However, patients often suffer moderate to severe postoperative pain [2]. Appropriate postoperative pain control is crucial for early ambulation, and better functional outcomes were usually achieved following postoperative rehabilitation. Moreover, optimal pain management may

decrease length of stay and the risk of adverse events, such as deep vein thrombosis (DVT) and pulmonary embolism (PE) [3]. Postoperative pain management for these procedures has been a topic of much debate for a few decades and remains controversial. Various attempts have been made, including systemic opiates, local infiltration analgesia, femoral nerve block and patient-controlled analgesia with oral narcotics [4–6]. Although it has been proven effective for pain relief, consumption of additional opiates comes along with potential adverse side effects, such as nausea, vomiting, respiratory depression and urinary retention [7–9].

Local infiltration analgesia (LIA) has been promoted for a few decades and shows excellent outcomes for pain relief after total knee and hip arthroplasty [10,11]. A mixture comprised of a long-acting local anesthetic, a non-steroid anti-inflammatory drug and

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epinephrine is most commonly used. LIA is considered a promising method with few side effects and good prospects for early mobilization without the weakening of quadriceps muscle strength. Intrathecal morphine (ITM) is also an alternative simple method for postoperative analgesia. Previous studies have suggested ITM achieves satisfactory pain control [12–14], but potentially life-threatening- morphine-related side effects were also reported.

To the best of our knowledge, direct comparisons of LIA versus ITM for pain management in joint replacement surgery have seldom been reported, leaving the optimal analgesia method in question. Therefore, we performed a meta-analysis from randomized controlled trials to evaluate the efficiency and safety of local infiltration analgesia and intrathecal morphine for pain control in total knee and hip arthroplasty.

## 2. Methods

### 2.1. Search strategy

We systemically search electronic databases including Embase (1980–2016.7), Medline (1966–2016.7), PubMed (1966–2016.7), ScienceDirect (1985–2016.7), web of science (1950–2016.7) and Cochrane Library for potential relevant articles. Gray academic studies are also identified from the reference of included studies. No language was restricted. The following terms was considered as key words “Total knee replacement and arthroplasty”, “Total hip replacement or arthroplasty”, “local infiltration analgesia”, “intrathecal morphine” and ‘pain control’ were used in combination with Boolean operators “and” or “or”. The retrieval process is presented in Fig. 1.

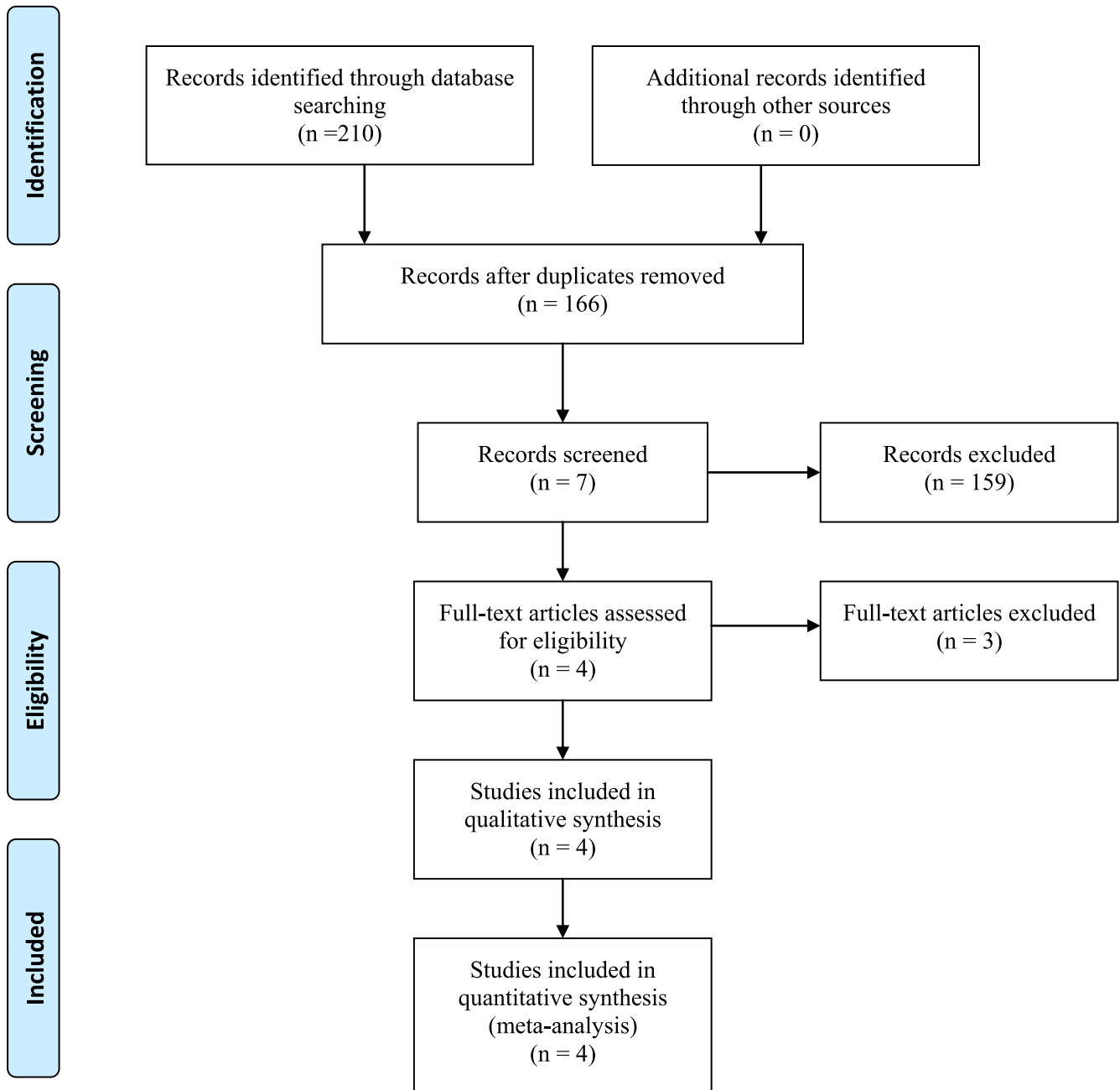


Fig. 1. Search results and the selection procedure.

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