

# INPLASY

## The safety and efficacy of perioperative use of dexamethasone in TKA

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### ADMINISTRATIVE INFORMATION

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**Review Stage at time of this submission** - Preliminary searches.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY202510035

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 10 January 2025 and was last updated on 10 January 2025.

### INTRODUCTION

**Review question / Objective** To evaluate the influence of administering perioperative dexamethasone on the likelihood of early postoperative infections subsequent to total knee arthroplasty.

**Condition being studied** Knee osteoarthritis (KOA) is a chronic disease based on degenerative pathological changes that often results in severe pain and physical disability in the elderly patients. Globally, there were roughly 654.1 million people aged 40 and up with knee osteoarthritis in 2020, causing a large social and economic burden. For end-stage knee osteoarthritis, total knee arthroplasty (TKA) is an effective solution. Demand for total knee arthroplasty in the United States has skyrocketed, with forecasts predicting a 673% surge in total knee arthroplasty, amounting to nearly 3.48 million procedures annually by 2030. However, the post-operative pain, nausea, vomiting and other possible complications affects

patient recovery and satisfaction. Although effective pain control after TKA can speed up recovery, shorten hospital stays, and reduce overall costs, the pain after total knee arthroplasty is usually very severe and difficult to relieve. Dexamethasone is a synthetic glucocorticoid known for its potent anti-inflammatory effects, and has demonstrated efficacy for reducing pain and the incidence and intensity of PONV. Some randomized controlled trials have demonstrated that dexamethasone can reduce the post-operative pain and PONV after TKA. However, the immunosuppressive effect of dexamethasone may increase the risk of the spread of infection, which result in the limitation of use in consideration of the potentially catastrophic periprostheses infection.

### METHODS

**Participant or population** Adults (age  $\geq 18$ ) with Knee osteoarthritis underwent primary unilateral TKA.

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**Intervention** Perioperative any dose of intravenous injection or periarticular injection of dexamethasone.

**Comparator** Placebo or same drugs/interventions.

**Study designs to be included** Randomized controlled trials.

**Eligibility criteria** Inclusion criteria

Studies will be considered for inclusion if they fulfill the criteria listed below: only RCTs; enrolled adults (age  $\geq 18$ ) with KOA underwent primary unilateral TKA; compared the dexamethasone (perioperative any dose of intravenous injection or periarticular injection) with placebo or no-treatments; Reported the adverse events including wound infection or periprostheses infection.

Exclusion criteria

Studies will be excluded if they meet any criteria listed below: not RCT; contained patients receiving unicompartmental arthroplasty, total hip arthroplasty or other joint arthroplasty; contained patients with rheumatoid arthritis, traumatic arthritis or other diseases affecting the pain of knee; administered any other glucocorticoid; dexamethasone used in spinal anesthesia, nerve block or taken orally; control measures are not placebo or other same drugs; not included the main outcomes like infection.

**Information sources** Conducted the search of several databases: Pubmed, Medline, Embase and Web of science databases, from inception to Jan 1, 2025.

**Main outcome(s)** Risk of infection, level of inflammatory factors are main outcomes.

**Additional outcome(s)** Post-operative pain score, the incidence of PONV, length of hospital stay and range of motion.

**Quality assessment / Risk of bias analysis** We assessed the quality of trials by using the Cochrane Collaboration risk of bias tool. The quality of evidence for the main outcome was evaluated using the grading of recommendations assessment, development, and evaluation (GRADE) approach.

**Strategy of data synthesis** Statistical analyses were carried out with Review Manager (version 5.4). Risk Difference (RD)/Risk-ratios (RR) and mean difference (MD) with 95% CI were used for the meta-analyses of dichotomous and continuous variables, respectively. A p-value less than 0.05

was considered significant. We assessed heterogeneity using the  $I^2$  test, considering  $I^2 < 50\%$ ,  $50 < I^2 < 75\%$  as low, moderate and high heterogeneity, respectively. If  $I^2 < 50\%$ , we used fixed effects models to pool outcomes, otherwise the random effects models were used.

**Subgroup analysis** We performed a subgroup analysis for intravenous injection and periarticular injection of dexamethasone.

**Sensitivity analysis** Review Manager (version 5.4) was applied to perform the sensitivity analysis.

**Language restriction** Only english.

**Country(ies) involved** China.

**Keywords** dexamethasone, total knee arthroplasty, infection, meta-analysis.

**Contributions of each author**

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