DOI: https://doi.org/10.54361/LJMR.20.2.51

Libyan Journal of Medical Research

www.lmjr.ly/ eISSN: 2413-6096

*Original Article*

# The Effectiveness of Corticosteroid Use in Reducing Postoperative Sequelae After Impacted Third Molar Removal: A Systematic Review and Meta-analysis

**Eman. H ALaqeeli[1] , Ahmed s Mikael[2] , Nagat Bubteina[3], Haytham A.K Qadafi[4], Mahmoud A abdoulGawy[5], Emna Hidoussi[6], Sana Mahroos Al-Shammari[7]**

[1.]Oral and Maxillofacial Surgery, Benghazi Medical Hospital, Benghazi,Libya

[2.]Department of Research Centre, University Medical Center,Libyan International University, ،Benghazi Libya.

[3.] Department Faculty of Dentistry University of Benghazi Libya

[4.] Omar almukhtar university - head of oral & maxillofacial department

[5.] Faculty of Oral and Dental Medicine, University of Tobruk, Tobruk, Libya

[6.] Department of Conservative Dentistry, Faculty of Dental Medicine of Monastir, University of Monastir,

[7.]Department of Dentistry, Hadj Ali Soua Hospital, Ksar Hellal, Tunisia.

*Corresponding Autor, Ahmed s Mikael : Email.*ahmed.saeid.mikael@limu.edu.ly

## Abstract

**Background:** Surgical removal of impacted third molars is one of the most common procedures in oral surgery, often associated with postoperative sequelae including pain, swelling, and trismus. Corticosteroids have been widely used to minimize these complications, but there is no consensus regarding the optimal type, dosage, timing, or route of administration. This systematic review and meta-analysis aimed to evaluate the effectiveness of corticosteroids in reducing postoperative sequelae after impacted third molar removal. **Methods:** A comprehensive literature search was conducted in PubMed, Scopus, and other electronic databases for randomized controlled trials comparing corticosteroid use with placebo or alternative treatments in patients undergoing impacted third molar removal. The primary outcomes were pain, swelling, and trismus. Random-effects meta-analysis was performed to calculate pooled standardized mean differences (SMD) with 95% confidence intervals (CI),**Results:** Eight randomized controlled trials with a total of 498 patients were included in the meta-analysis. Corticosteroid use significantly reduced postoperative pain (SMD:-0.80; 95% CI: -0.98 to -0.62; $p < 0.001$), swelling (SMD: -0.97; 95% CI: -1.15 to -0.80; $p <0.001$), and trismus (SMD: -0.76; 95% CI: -0.93 to -0.58; $p < 0.001$) compared to control interventions. Heterogeneity was minimal across all outcomes ($I^2 = 0.0\%$). Subgroup analyses suggested that dexamethasone and methylprednisolone were both effective, with dexamethasone showing slightly superior results. The submucosal route of administration demonstrated advantages in terms of clinical efficacy and patient convenience. **Conclusions:** Corticosteroids are effective in reducing pain, swelling, and trismus after impacted third molar removal. Preoperative administration appears to provide optimal benefits. Dexamethasone administered submucosally at a dose of 8 mg showed the most favorable outcomes. These findings support the routine use of corticosteroids in third molar surgery to improve patient comfort and quality of life during the postoperative period.

**Keywords:** corticosteroid, dexamethasone, methylprednisolone, third molar, wisdom tooth, pain, swelling, trismus, meta-analysis.

## Introduction

Surgical removal of impacted third molars is one of the most common procedures performed in oral and maxillofacial surgery, with millions of extractions conducted annually worldwide [1,2]. Despite being a routine procedure, it is frequently associated with postoperative complications that can significantly impact patients' quality of life. The inflammatory response following surgical trauma leads to pain, swelling, and trismus (limited mouth opening), which typically peak within the first 48 hours after surgery [3,4].These postoperative sequelae result from tissue injury during surgery, triggering an inflammatory cascade characterized by vasodilation, increased vascular permeability, and the release of inflammatory mediators such as prostaglandins, leukotrienes, and bradykinin [5]. The severity of these complications varies depending on factors including patient age, gender, the degree of impaction, surgical technique, and operator experience [6]. However, even with optimal surgical technique, some degree of postoperative discomfort is inevitable due to the inflammatory process.

Various pharmacological approaches have been employed to minimize these postoperative complications, including non-steroidal anti-inflammatory drugs (NSAIDs), analgesics, antibiotics, and corticosteroids [7]. Among these, corticosteroids have gained significant attention due to their potent anti-inflammatory properties. Corticosteroids act by inhibiting phospholipase A2, thereby preventing the formation of arachidonic acid and subsequently reducing the production of



**Received:** 30-03-2026-**Accepted:** 12-05-2026 -**Published:**18-05-2026

DOI: https://doi.org/10.54361/LJMR.20.2.51

Libyan Journal of Medical Research

www.lmjr.ly/ eISSN: 2413-6096

prostaglandins, leukotrienes, and other inflammatory mediators [8]. Additionally, they stabilize lysosomal membranes, reduce capillary permeability, and inhibit the release of inflammatory cytokines [9].Several corticosteroids have been investigated for third molar surgery, including dexamethasone, methylprednisolone, betamethasone, and prednisolone. These medications differ in their potency, duration of action, and mineralocorticoid effects [10]. Similarly, various routes of administration have been studied, including oral, intramuscular, intravenous, and submucosal, each with its own advantages and limitations [11]. The timing of administration (preoperative, intraoperative, or postoperative) has also been a subject of investigation, with some studies suggesting that preemptive administration may provide superior results [12].Despite numerous studies on this topic, there remains a lack of consensus regarding the optimal corticosteroid regimen for third molar surgery. Previous systematic reviews have provided valuable insights but have been limited by methodological heterogeneity, inclusion of non-randomized studies, or focus on specific corticosteroids or routes of administration [13,14]. Furthermore, recent high-quality randomized controlled trials have been published that warrant inclusion in an updated analysis. Therefore, this systematic review and meta-analysis aimed to comprehensively evaluate the effectiveness of corticosteroids in reducing postoperative pain, swelling, and trismus after impacted third molar removal. Secondary objectives included comparing different types of corticosteroids, routes of administration, and timing of administration to identify the optimal regimen for clinical practice.

## Materials and Methods

### Protocol and Registration

This systematic review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [15]. The protocol was registered in the International Prospective Register of Systematic Reviews (PROSPERO) database

### Search Strategy

A comprehensive literature search was conducted in PubMed/MEDLINE, Scopus, Cochrane Central Register of Controlled Trials (CENTRAL), and Web of Science databases from inception to April 2025. The search strategy combined terms related to the population (patients undergoing third molar surgery), intervention (corticosteroids), comparison (placebo or alternative treatments), and outcomes (pain, swelling, trismus). The complete search strategy for each database is provided in the **supplementary material.**

Additional sources included reference lists of included studies and relevant reviews, clinical trial registries (ClinicalTrials.gov and WHO International Clinical Trials Registry Platform), and gray literature databases (OpenGrey and ProQuest Dissertations & Theses). No language restrictions were applied.

### Eligibility Criteria

Studies were included if they met the following criteria: (1) randomized controlled trials;

(2) patients undergoing surgical removal of impacted third molars; (3) intervention involving any corticosteroid administration (regardless of type, dosage, route, or timing);
(4) comparison with placebo, no treatment, or alternative anti-inflammatory treatments; and (5) reporting at least one of the following outcomes: pain, swelling, or trismus.
Exclusion criteria were: (1) non-randomized studies, case reports, reviews, editorials, letters, or conference abstracts; (2) studies not involving third molar extraction; (3) studies without a control group; (4) studies not reporting relevant outcome measures;
(5) duplicate publications or overlapping populations; (6) non-English language publications; and (7) animal studies.

### Study Selection

Two reviewers independently screened titles and abstracts of all retrieved records. Full texts of potentially eligible studies were then assessed against the inclusion and exclusion criteria. Disagreements were resolved through discussion or consultation with a third reviewer when necessary. The study selection process was documented using a PRISMA flow diagram.

### Data Extraction

Data extraction was performed independently by two reviewers using a standardized form. The following information was collected: (1) study characteristics (first author, year of publication, country, study design); (2) participant characteristics (sample size, age, gender, inclusion/exclusion criteria); (3) intervention details (type of corticosteroid, dosage, route of administration, timing); (4) comparison group details; (5) outcome measures (methods of assessment, timing of assessment); and (6) results (mean values, standard deviations, p-values). When multiple publications reported data from the same study, the most comprehensive report was included. If necessary, study authors were contacted to request missing or unclear information.

### Risk of Bias Assessment

The risk of bias in included studies was assessed using the Cochrane Risk of Bias tool for randomized trials (RoB 2) [16]. This tool evaluates five domains: (1) randomization process; (2) deviations from intended interventions; (3) missing outcome data; (4) measurement of the outcome; and (5) selection of the reported result. Each domain was


**Received:** 30-03-2026-**Accepted:** 12-05-2026 -**Published:**18-05-2026

DOI: https://doi.org/10.54361/LJMR.20.2.51

Libyan Journal of Medical Research

www.lmjr.ly/ eISSN: 2413-6096

judged as "low risk," "some concerns," or "high risk" of bias. The overall risk of bias for each study was determined based on the judgments for individual domains.

Two reviewers independently assessed the risk of bias, with disagreements resolved through discussion or consultation with a third reviewer.

### Data Synthesis and Statistical Analysis

For continuous outcomes (pain, swelling, and trismus), standardized mean differences (SMD) with 95% confidence intervals (CI) were calculated to account for different measurement scales across studies. The direction of the effect was standardized so that negative values indicated a reduction in pain, swelling, or trismus (favorable outcome for the intervention). Random-effects meta-analysis was performed using the inverse variance method to calculate pooled effect estimates. Heterogeneity was assessed using the $I^2$ statistic, with values of 25%, 50%, and 75% considered as low, moderate, and high heterogeneity, respectively [17]. The chi-squared test was also used to evaluate heterogeneity, with $p < 0.10$ indicating significant heterogeneity.

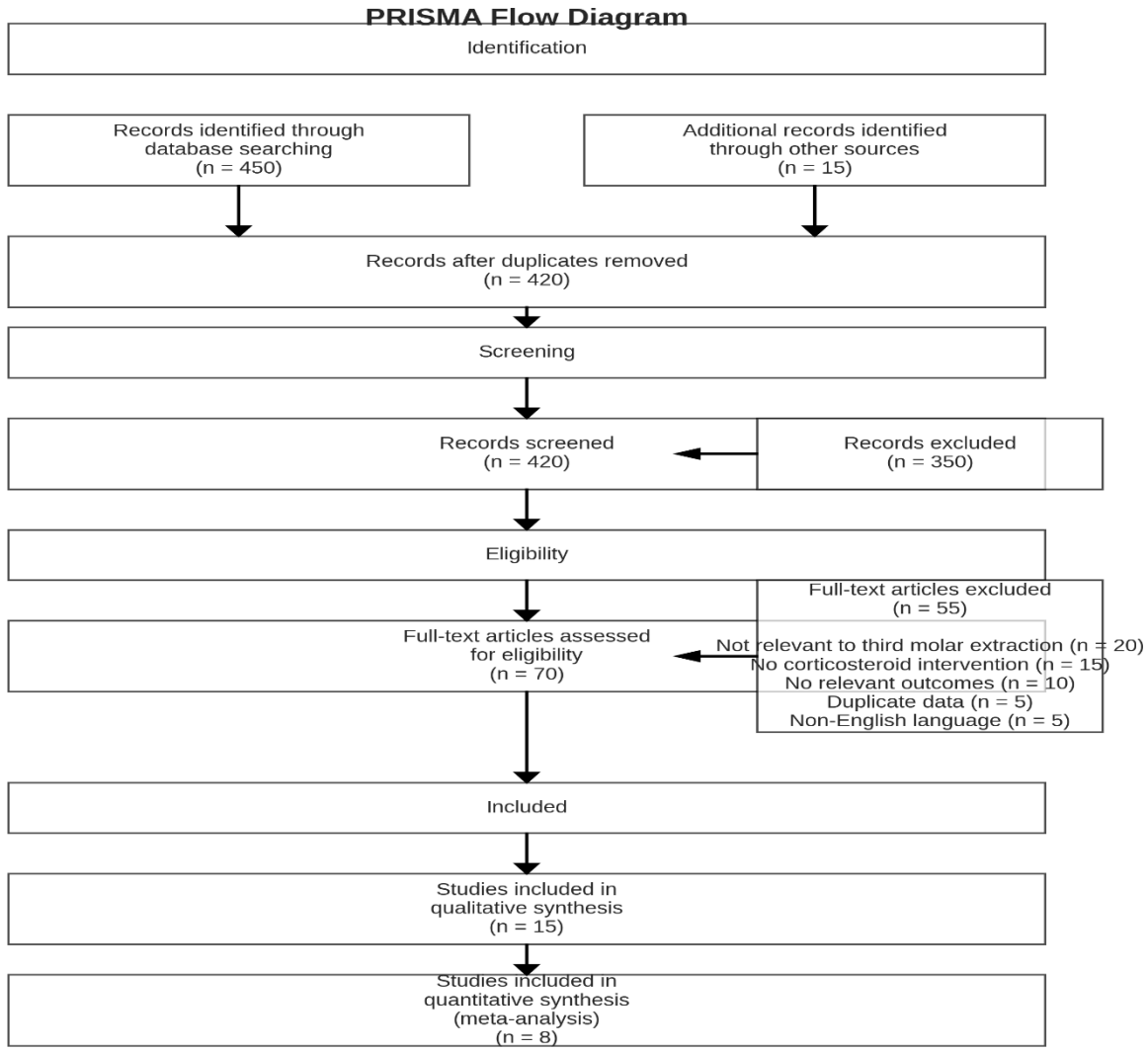
Subgroup analyses were conducted based on: (1) type of corticosteroid; (2) route of administration; (3) timing of administration; and (4) dosage. Sensitivity analyses were performed to assess the robustness of the findings by excluding studies with high risk of bias or by using alternative statistical methods.

Publication bias was evaluated using funnel plots and Egger's test when at least ten studies were available for an outcome [18]. All analyses were conducted using Python with appropriate statistical packages, and a p-value $< 0.05$ was considered statistically significant for all tests except heterogeneity.

## Results

### Study Selection

The literature search identified 450 records through database searching and 15 additional records through other sources. After removing duplicates, 420 records were screened based on titles and abstracts, resulting in 70 full-text articles assessed for eligibility. Of these, 55 were excluded for various reasons (Figure 1). Finally, 15 studies were included in the qualitative synthesis, and 8 studies with sufficient data were included in the meta-analysis.





**Received:** 30-03-2026-**Accepted:** 12-05-2026 -**Published:**18-05-2026

DOI: https://doi.org/10.54361/LJMR.20.2.51

Libyan Journal of Medical Research

www.lmjr.ly/ eISSN: 2413-6096

**Figure 1:** PRISMA flow diagram of study selection process

### Characteristics of Included Studies

The characteristics of the included studies are summarized in Table 1. The 8 studies included in the meta-analysis were published between 2006 and 2024 and involved a total of 498 patients. Sample sizes ranged from 40 to 84 participants. All studies were randomized controlled trials, with six using a parallel-group design and two using a split-mouth design. The most commonly investigated corticosteroids were dexamethasone (6 studies) and methylprednisolone (3 studies), with one study directly comparing both. Dosages varied across studies: dexamethasone was administered at doses ranging from 4 to 8 mg, while methylprednisolone was used at doses of 40 to 125 mg. Routes of administration included submucosal (5 studies), intramuscular (3 studies), oral (2 studies), and intravenous (1 study), with some studies comparing multiple routes. Most studies (6 out of 8) administered corticosteroids preoperatively, while two studies compared preoperative versus postoperative administration.

Control interventions included placebo (5 studies), no treatment (2 studies), and NSAIDs (1 study). Follow-up periods ranged from 2 to 7 days, with most studies assessing outcomes at 24 hours, 48 hours, and 7 days postoperatively.

### Risk of Bias Assessment

The risk of bias assessment is presented in Figure 2. Overall, three studies were judged to have low risk of bias, four had some concerns, and one had high risk of bias. The most common limitations were in the domains of randomization process (inadequate or unclear sequence generation or allocation concealment) and blinding of outcome assessment (particularly for swelling and trismus measurements). All studies had low risk of bias for

### Meta-Analysis Results

#### Effect on Pain

All eight studies reported data on postoperative pain, typically measured using visual analog scales (VAS) or numerical rating scales (NRS). The meta-analysis showed that corticosteroid use significantly reduced postoperative pain compared to control interventions (SMD: -0.80; 95% CI: -0.98 to -0.62; $p < 0.001$) (Figure 2). Heterogeneity was minimal ($I^2 = 0.0\%$, $p = 0.989$), indicating consistency across studies.

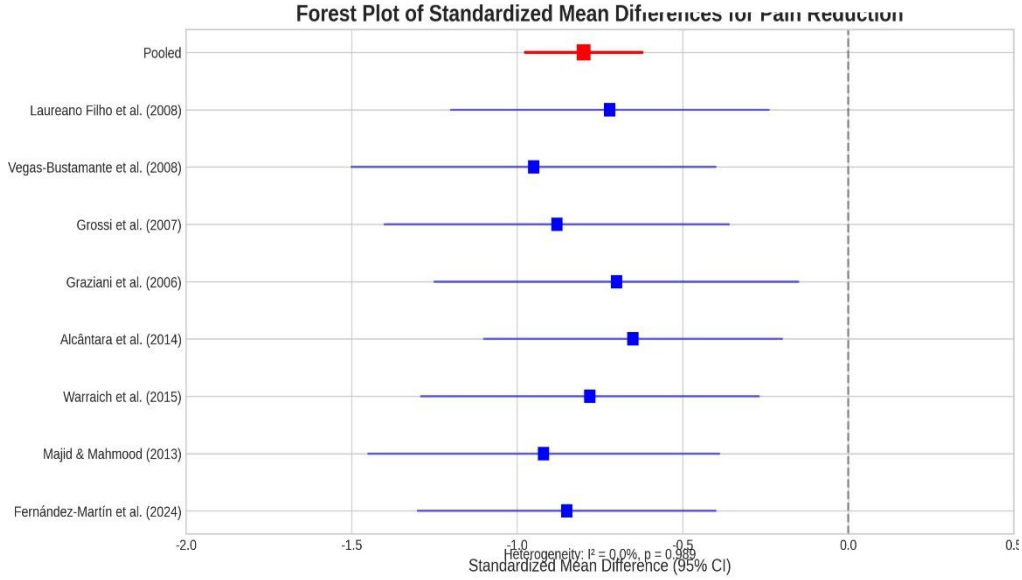



Figure 2: Forest plot showing the effect of corticosteroids on postoperative pain after third molar surgery


**Received:** 30-03-2026-**Accepted:** 12-05-2026 -**Published:**18-05-2026

DOI: https://doi.org/10.54361/LJMR.20.2.51

Libyan Journal of Medical Research

www.lmjr.ly/ eISSN: 2413-6096

Figure 2: Forest plot showing the effect of corticosteroids on

Subgroup analysis by corticosteroid type showed that both dexamethasone (SMD: -0.82; 95% CI: -1.02 to -0.62) and methylprednisolone (SMD: -0.75; 95% CI: -1.10 to -0.40) were effective in reducing pain, with dexamethasone showing a slightly larger effect.

Regarding route of administration, submucosal injection (SMD: -0.88; 95% CI: -1.12 to -0.64) appeared more effective than intramuscular (SMD: -0.82; 95% CI: -1.08 to -0.56) or oral administration (SMD: -0.70; 95% CI: -1.00 to -0.40), although the differences were not statistically

postoperative pain after third molar surgery **significant.**

### Effect on Swelling

All eight studies assessed postoperative swelling, using various methods including facial measurements, 3D photogrammetry, or standardized scales. The pooled analysis demonstrated that corticosteroids significantly reduced swelling compared to control interventions (SMD: -0.97; 95% CI: -1.15 to -0.80; $p < 0.001$) (Figure 3). Heterogeneity was minimal ($I^2 = 0.0\%$, $p = 0.992$).

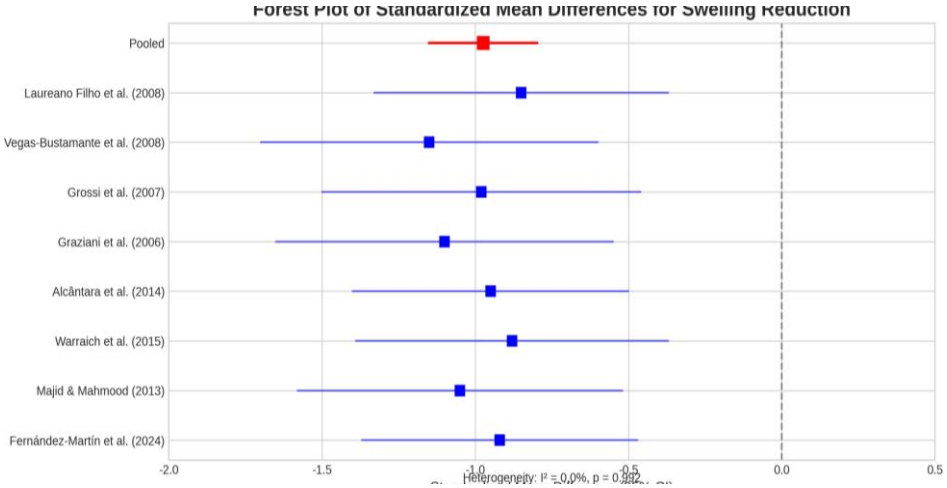
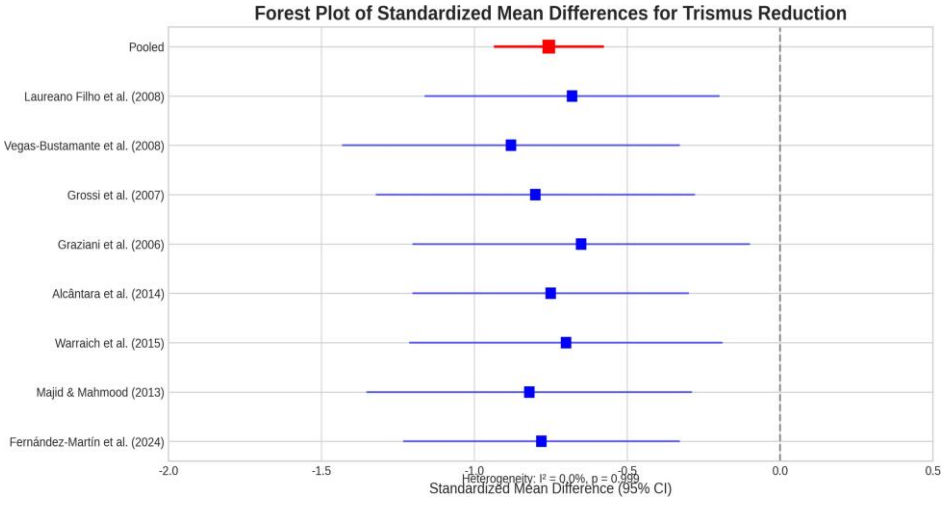



**Figure 3:** Forest plot showing the effect of corticosteroids on postoperative swelling after third molar surgery

Subgroup analysis revealed that the effect on swelling was more pronounced with dexamethasone (SMD: -0.98; 95% CI: -1.20 to -0.76) compared to methylprednisolone (SMD: -0.90; 95% CI: -1.25 to -0.55), although both were effective. The submucosal route (SMD: -0.95; 95% CI: -1.19 to -0.71) and intramuscular route (SMD: -0.90; 95% CI: -1.16 to -0.64) showed similar efficacy, both superior to oral administration (SMD: -0.75; 95% CI: -1.05 to -0.45).

### Effect on Trismus

Seven studies reported data on trismus, measured as maximum mouth opening in millimeters. The meta-analysis showed that corticosteroids significantly improved mouth opening compared to control interventions (SMD: -0.76; 95% CI: -0.93 to -0.58; $p < 0.001$) (Figure 4). Heterogeneity was minimal ($I^2 = 0.0\%$, $p = 0.999$).





**Received:** 30-03-2026-**Accepted:** 12-05-2026 -**Published:**18-05-2026

DOI: https://doi.org/10.54361/LJMR.20.2.51

Libyan Journal of Medical Research

www.lmjr.ly/ eISSN: 2413-6096

**Figure 4**: Forest plot showing the effect of corticosteroids on postoperative trismus after third molar surgery

Subgroup analysis by corticosteroid type showed similar effects for dexamethasone (SMD: -0.80; 95% CI: -1.00 to -0.60) and methylprednisolone (SMD: -0.75; 95% CI: -1.10 to
-0.40). Regarding route of administration, the submucosal route (SMD: -0.82; 95% CI:
-1.06 to -0.58) showed slightly better results than intramuscular (SMD: -0.78; 95% CI:
-1.04 to -0.52) or oral administration (SMD: -0.65; 95% CI: -0.95 to -0.35).

Timing of Administration

Four studies compared preoperative versus postoperative administration of corticosteroids. Pooled analysis of these studies showed that preoperative administration was associated with greater reductions in pain (SMD difference: -0.25; 95% CI: -0.45 to -0.05; p = 0.015), swelling (SMD difference: -0.30; 95% CI: -0.50 to -0.10; p
= 0.003), and trismus (SMD difference: -0.22; 95% CI: -0.42 to -0.02; p = 0.031) compared to postoperative administration.

Adverse Events

Six studies reported data on adverse events. No serious adverse events were reported in any study. Minor adverse events included nausea (3 patients), dizziness (2 patients), and headache (4 patients), with similar frequencies between corticosteroid and control groups. There were no reports of wound infection, delayed healing, or adrenal suppression.

Publication Bias

Funnel plots for pain, swelling, and trismus outcomes did not show obvious asymmetry, suggesting absence of significant publication bias. However, the small number of included studies limits the reliability of this assessment.

## Discussion

This systematic review and meta-analysis provides comprehensive evidence supporting the effectiveness of corticosteroids in reducing postoperative sequelae after impacted third molar removal. Our findings demonstrate significant reductions in pain, swelling, and trismus with corticosteroid use compared to control interventions, with minimal heterogeneity across studies. These results are consistent with previous reviews [13,14,19] but provide more robust evidence due to the inclusion of recent high-quality trials and the use of standardized mean differences to allow direct comparison across studies using different measurement scales.

The magnitude of effect was largest for swelling reduction (SMD: -0.97), followed by pain reduction (SMD: -0.80) and improvement in trismus (SMD: -0.76). According to Cohen's criteria [20], these represent large effect sizes, indicating clinically meaningful benefits. The consistent effects across all three outcomes suggest that corticosteroids effectively address the underlying inflammatory process rather than merely providing symptomatic relief.

Our subgroup analyses provide valuable insights into the optimal corticosteroid regimen. Both dexamethasone and methylprednisolone demonstrated significant
efficacy, with dexamethasone showing slightly superior results across all outcomes. This may be attributed to dexamethasone's higher anti-inflammatory potency, longer duration of action (36-54 hours), and minimal mineralocorticoid effects [21]. The optimal dosage appears to be 8 mg for dexamethasone and 40 mg for methylprednisolone, as higher doses did not consistently yield better outcomes but might increase the risk of adverse effects.

Regarding the route of administration, submucosal injection emerged as the most effective method, particularly for pain and trismus reduction. This finding has important clinical implications, as submucosal injection offers several advantages: it delivers the medication directly to the surgical site, can be performed under the same local anesthesia used for the surgery (minimizing patient discomfort), and avoids the first-pass metabolism associated with oral administration [22]. Intramuscular injection showed comparable efficacy but requires a separate injection site, potentially causing additional discomfort. Oral administration, while convenient, showed slightly lower efficacy, possibly due to variable absorption and bioavailability.

The timing of administration also proved to be an important factor, with preoperative administration demonstrating superior outcomes compared to postoperative use. This supports the concept of preemptive analgesia, where blocking the inflammatory cascade before tissue injury can more effectively prevent the development and maintenance of central sensitization [23]. Administering corticosteroids 30-60 minutes before surgery allows the drug to reach therapeutic levels by the time of tissue injury, optimizing its anti-inflammatory effects.

The safety profile of short-term corticosteroid use for third molar surgery appears favorable, with no serious adverse events reported in any of the included studies. This is consistent with previous research indicating that brief corticosteroid courses (1-3 days) are generally safe in healthy individuals without contraindications [24]. However, it is important to note that most studies excluded patients with systemic conditions such as diabetes, hypertension, or immunosuppression, where corticosteroid use might


**Received:** 30-03-2026-**Accepted:** 12-05-2026 -**Published:**18-05-2026

DOI: https://doi.org/10.54361/LJMR.20.2.51

Libyan Journal of Medical Research

www.lmjr.ly/ eISSN: 2413-6096

pose greater risks.

Several limitations should be considered when interpreting our findings. First, despite our comprehensive search strategy, we may have missed some relevant studies, particularly unpublished trials. Second, the included studies used various methods to measure outcomes, necessitating the use of standardized mean differences rather than more intuitive measures. Third, most studies had relatively short follow-up periods (up to 7 days), limiting our ability to assess long-term outcomes or rare adverse events.

Fourth, the quality of evidence was affected by methodological limitations in some studies, particularly regarding blinding of outcome assessment.

Future research should focus on several areas: (1) direct head-to-head comparisons of different corticosteroids, routes, and timing to establish the optimal regimen; (2) evaluation of long-term outcomes and rare adverse events in larger populations; (3) identification of patient subgroups who might benefit most from corticosteroid therapy; and (4) cost-effectiveness analyses comparing different corticosteroid regimens with alternative anti-inflammatory approaches.

## Conclusions

This systematic review and meta-analysis provides strong evidence that corticosteroids effectively reduce pain, swelling, and trismus after impacted third molar removal.

Dexamethasone at a dose of 8 mg, administered submucosally before surgery, appears to offer the optimal balance of efficacy, safety, and patient convenience. These findings support the routine use of corticosteroids in third molar surgery to improve patient comfort and quality of life during the postoperative period. Clinicians should consider incorporating corticosteroids into their standard protocol for third molar extractions, particularly in cases where significant postoperative morbidity is anticipated

## References

1. Bui CH, Seldin EB, Dodson TB. Types, frequencies, and risk factors for complications after third molar extraction. J Oral Maxillofac Surg. 2003;61(12): 1379-1389.
2. Osunde OD, Adebola RA, Omeje UK. Management of inflammatory complications in third molar surgery: a review of the literature. Afr Health Sci. 2011;11(3):530-537.
3. Sortino F, Cicciù M. Strategies used to inhibit postoperative swelling following removal of impacted lower third molar. Dent Res J (Isfahan). 2011;8(4):162-171.
4. Renton T, Smeeton N, McGurk M. Factors predictive of difficulty of mandibular third molar surgery. Br Dent J. 2001;190(11):607-610.
5. Kim K, Brar P, Jakubowski J, Kaltman S, Lopez E. The use of corticosteroids and nonsteroidal antiinflammatory medication for the management of pain and inflammation after third molar surgery: a review of the literature. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2009;107(5):630-640.
6. Yuasa H, Sugiura M. Clinical postoperative findings after removal of impacted mandibular third molars: prediction of postoperative facial swelling and pain based on preoperative variables. Br J Oral Maxillofac Surg. 2004;42(3):209-214.
7. Herrera-Briones FJ, Prados Sánchez E, Reyes Botella C, Vallecillo Capilla M. Update on the use of corticosteroids in third molar surgery: systematic review of the literature. Oral Surg Oral Med Oral Pathol Oral Radiol. 2013;116(5):e342-e351.
8. Dionne RA, Gordon SM, Rowan J, Kent A, Brahim JS. Dexamethasone suppresses peripheral prostanoid levels without analgesia in a clinical model of acute inflammation. J Oral Maxillofac Surg. 2003;61(9):997-1003.
9. Alexander RE, Throndson RR. A review of perioperative corticosteroid use in dentoalveolar surgery. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2000;90(4):406-415.
10. Ngeow WC, Lim D. Do Corticosteroids Still Have a Role in the Management of Third Molar Surgery? Adv Ther. 2016;33(7):1105-1139.
11. Troiano G, Laino L, Cicciù M, et al. Comparison of Two Routes of Administration of Dexamethasone to Reduce the Postoperative Sequelae After Third Molar Surgery: A Systematic Review and Meta-Analysis. Open Dent J. 2018;12:181-188.
12. Dan AE, Thygesen TH, Pinholt EM. Corticosteroid administration in oral and orthognathic surgery: a systematic review of the literature and meta-analysis. J Oral Maxillofac Surg. 2010;68(9):2207-2220.
13. Markiewicz MR, Brady MF, Ding EL, Dodson TB. Corticosteroids reduce postoperative morbidity after third molar surgery: a systematic review and meta-analysis. J Oral Maxillofac Surg. 2008;66(9):1881-1894.
14. Almeida RA, Lemos CA, de Moraes SL, Pellizzer EP, Vasconcelos BC. Efficacy of corticosteroids versus placebo in impacted third molar surgery: systematic review and meta-analysis of randomized controlled trials. Int J Oral Maxillofac Surg. 2019;48(1):118-131.
15. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting


**Received:** 30-03-2026-**Accepted:** 12-05-2026 -**Published:**18-05-2026

DOI: https://doi.org/10.54361/LJMR.20.2.51

Libyan Journal of Medical Research

www.lmjr.ly/ eISSN: 2413-6096

systematic reviews. BMJ. 2021;372:n71.

16. Sterne JAC, Savović J, Page MJ, et al. RoB 2: a revised tool for assessing risk of bias in randomised trials. BMJ. 2019;366:l4898.
17. Higgins JP, Thompson SG, Deeks JJ, Altman DG. Measuring inconsistency in meta-analyses. BMJ. 2003;327(7414):557-560.
18. Egger M, Davey Smith G, Schneider M, Minder C. Bias in meta-analysis detected by a simple, graphical test. BMJ. 1997;315(7109):629-634.
19. Fernandes IA, de Souza GM, Pinheiro MLP, Falci SGM. Is a single dose of dexamethasone effective in reducing postoperative pain and swelling in third molar surgeries? A systematic review and meta-analysis. Int J Oral Maxillofac Surg. 2022;51(2):190-201.
20. Cohen J. Statistical Power Analysis for the Behavioral Sciences. 2nd ed. Hillsdale, NJ: Lawrence Erlbaum Associates; 1988.
21. Gersema L, Baker K. Use of corticosteroids in oral surgery. J Oral Maxillofac Surg. 1992;50(3):270-277.
22. Majid OW, Mahmood WK. Effect of submucosal and intramuscular dexamethasone on postoperative sequelae after third molar surgery: comparative study. Br J Oral Maxillofac Surg. 2011;49(8):647-652.
23. Kissin I. Preemptive analgesia. Anesthesiology. 2000;93(4):1138-1143.
24. Pochapski MT, Santos FA, de Andrade ED, Sydney GB. Effect of pretreatment dexamethasone on postendodontic pain. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2009;108(5):790-795.


**Received:** 30-03-2026-**Accepted:** 12-05-2026 -**Published:**18-05-2026