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The Analysis Study of Effectiveness of Corticosteroid and Lidocaine Injection for Hip Osteoarthritis: A Ten Years Systematic Review

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ABSTRACT

Background: Hip osteoarthritis (OA) is a common cause of chronic pain and disability that affects millions of people. It happens when the hip joint wears down over time, making movement painful and difficult. This systematic review aims to evaluate current literatures about the effectiveness of corticosteroid and lidocaine injection on hip osteoarthritis. **Methods:** The study followed PRISMA 2020 guidelines, reviewing English-language publications from 2015 to 2025. Editorials, duplicate reviews from the same journal, and papers lacking a DOI were excluded. The literature search was conducted using PubMed, SagePub, SpringerLink, and Google Scholar. **Result:** A total of 2,172 articles were initially identified through online databases (PubMed, SagePub, SpringerLink, and Google Scholar). After three rounds of screening, eight relevant studies were selected for full-text analysis. **Conclusion:** Corticosteroid and lidocaine injections remain a valuable option for short-term pain relief in hip OA, particularly for patients with synovitis or effusion. However, concerns regarding long-term joint health, infection risks, and diminishing efficacy over time suggest that these injections should be used judiciously.

Keyword : hip osteoarthritis, corticosteroid, lidocaine

INTRODUCTION

Hip osteoarthritis (OA) is a common cause of chronic pain and disability that affects millions of people. It happens when the hip joint wears down over time, making movement painful and difficult. Treatments usually focus on easing symptoms and slowing the disease. These include physical therapy, weight management, and patient education. Medications like painkillers and joint injections can help for a while, but many patients need better options that provide long-lasting relief without surgery.^{1,2}

One common treatment is corticosteroid injections, which are used to reduce inflammation and pain in the hip joint. These steroids block inflammation, making it easier to move the joint. However, their effects may wear off over time, and some research suggests they could even harm the joint. Many injections also include lidocaine, a numbing medicine that gives quick but short-term pain relief. While both corticosteroids and lidocaine are widely used, their effectiveness when used together for hip OA is still debated.^{3,4}

Even though corticosteroid injections can provide short-term pain relief, not all patients respond the same way. Some people with joint swelling (synovitis) or fluid buildup (effusion) may experience better results from corticosteroid-lidocaine injections. This suggests that the treatment might work better for certain patients. However, there are also risks, such as possible joint infections or side effects from steroids, so doctors need to weigh the benefits and risks before recommending these injections.^{5,6}

Because of the mixed results from past research, a systematic review is needed to look at all the available studies and determine how well corticosteroid and lidocaine injections actually work for hip OA. This review will focus on pain relief, how long the effects last, how well patients function after treatment, and any side effects. By combining data from multiple studies, this review aims to provide clearer answers and guide doctors in choosing the best treatment options. Understanding whether corticosteroid-lidocaine injections are better than lidocaine-only injections will help improve treatment decisions and patient care. It is also important to identify which patients might benefit the most from corticosteroid

injections.⁷⁻⁹ This systematic review aims to evaluate current literatures about the effectiveness of corticosteroid and lidocaine injection on hip osteoarthritis.

METHODS

Protocol

The study strictly adhered to the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020 guidelines to ensure methodological rigor and accuracy. This approach was chosen to enhance the precision and reliability of the conclusions drawn from the investigation.

Criteria for Eligibility

This systematic review aims to evaluate current literatures about the effectiveness of corticosteroid and lidocaine injection on hip osteoarthritis based on literatures of the last decade. The review aimed to provide insights to improve patient treatment strategies, with an emphasis on the significance of key findings in the reviewed studies. Inclusion criteria for the study included: 1) Papers published in English, and 2) Papers published between 2014 and 2024. Exclusion criteria were: 1) Editorials, 2) Papers without a DOI, 3) Previously published review articles, and 4) Duplicate entries in journals.

Search Strategy

The keywords used for this research are hip osteoarthritis, corticosteroid, lidocaine. The Boolean MeSH keywords inputted on databases for this research are: *("osteoarthritis, hip"[MeSH Terms] OR ("osteoarthritis"[All Fields] AND "hip"[All Fields]) OR "hip osteoarthritis"[All Fields] OR ("hip"[All Fields] AND "osteoarthritis"[All Fields])) AND ("adrenal cortex hormones"[MeSH Terms] OR ("adrenal"[All Fields] AND "cortex"[All Fields] AND "hormones"[All Fields]) OR "adrenal cortex hormones"[All Fields] OR "corticosteroid"[All Fields] OR "corticosteroids"[All Fields] OR "corticosteroidal"[All Fields] OR "corticosteroide"[All Fields] OR "corticosteroides"[All Fields]) AND ("lidocain"[All Fields] OR "lidocaine"[MeSH Terms] OR "lidocaine"[All Fields] OR "lignocaine"[All Fields] OR "lidocaine s"[All Fields] OR "lignocain"[All Fields]).*

Data retrieval

Abstracts and titles were screened to assess their eligibility, and only studies meeting the inclusion criteria were selected for further analysis. Literature that fulfilled all predefined criteria and directly related to the topic was included. Studies that did not meet these criteria were excluded. Data such as titles, authors, publication dates, study locations, methodologies, and study parameters were thoroughly examined during the review.

Quality Assessment and Data Synthesis

Each author independently assessed the titles and abstracts of the selected studies to identify those for further exploration. Articles that met the inclusion criteria underwent further evaluation. Final decisions on inclusion were based on the findings from this review process.

Table 1. Article Search Strategy

Database	Keywords	Hits
Pubmed	<i>("osteoarthritis, hip"[MeSH Terms] OR ("osteoarthritis"[All Fields] AND "hip"[All Fields]) OR "hip osteoarthritis"[All Fields] OR ("hip"[All Fields] AND "osteoarthritis"[All Fields])) AND ("adrenal cortex hormones"[MeSH Terms] OR ("adrenal"[All Fields] AND "cortex"[All Fields] AND "hormones"[All Fields]) OR "adrenal cortex hormones"[All Fields] OR "corticosteroid"[All Fields] OR "corticosteroids"[All Fields] OR "corticosteroidal"[All Fields] OR "corticosteroide"[All Fields] OR "corticosteroides"[All Fields]) AND ("lidocain"[All Fields] OR "lidocaine"[MeSH Terms] OR "lidocaine"[All Fields] OR "lignocaine"[All Fields] OR "lidocaine s"[All Fields] OR "lignocain"[All Fields])</i>	466
Springer Link	((hip osteoarthritis) AND (corticosteroid)) AND (lidocaine)	402
Sagepub	((hip osteoarthritis) AND (corticosteroid)) AND (lidocaine)	500
Google Scholar	((hip osteoarthritis) AND (corticosteroid)) AND (lidocaine)	804

Table 2. JBI *Critical appraisal of Study*

Parameters	Paski ns (202 2)	Ertü rk (201 6)	Ram pal (202 2)	Pask ins (202 0)	Kigo zi (202 5)	Par k (20 15)	Mi ng (20 22)	Bro oke s (202 4)
1. Bias related to temporal precedence								
Is it clear in the study what is the “cause” and what is the “effect” (ie, there is no confusion about which variable comes first)?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2. Bias related to selection and allocation								
Was there a control group?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3. Bias related to confounding factors								
Were participants included in any comparisons similar?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4. Bias related to administration of intervention/exposure								
Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of interest?	No.	No.	No.	No.	No.	No.	No.	No.
5. Bias related to assessment, detection, and measurement of the outcome								
Were there multiple measurements of the outcome, both pre and post the intervention/exposure?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Were the outcomes of participants included in any comparisons measured in the same way?	No.	No.	No.	No.	No.	No.	No.	No.
Were outcomes measured in a reliable way?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6. Bias related to participant retention								
Was follow-up complete and, if not, were differences between groups in terms of their follow-up adequately described and analyzed?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7. Statistical conclusion validity								
Was appropriate statistical analysis used?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

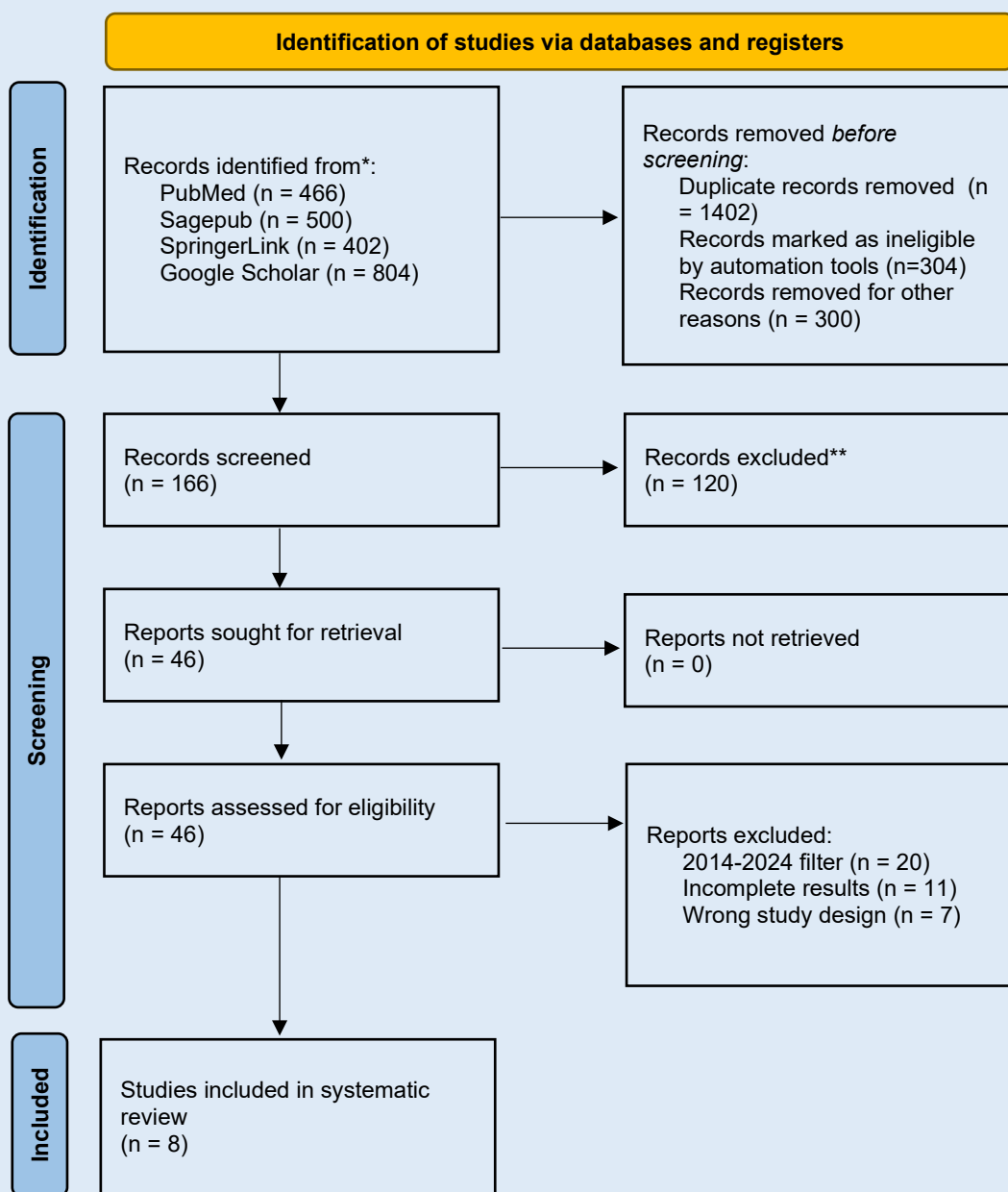


Figure 1. Article search flowchart

RESULT

The initial number of articles retrieved from online databases (PubMed, SagePub, SpringerLink, and Google Scholar) is 2,172 articles. After conducting three levels of screening, eight articles that directly relate to the current systematic review have been chosen for further assessment through full-text reading and analysis. Table 3 presents the selected literature included in this analysis.

Table 3. The literature included in this study

No.	Author	Origin	Method	Sample	Result
1.	Paskins, et al. ¹⁰ (2022)	UK	RCT	199	The study included participants with a mean age of 62.8 years, with 57% being women. The follow-up rate was 93%. Over six months, the combination of BCT and ultrasound-guided triamcinolone-lidocaine injection showed significantly greater pain reduction compared to BCT alone (mean difference -1.43, P<0.001). However, there was no significant difference between the corticosteroid-lidocaine and lidocaine-only groups. Patients with ultrasound-confirmed synovitis or effusion experienced greater benefits from corticosteroid injections. One participant in the corticosteroid group died from bacterial endocarditis, possibly linked to treatment. The study concludes that ultrasound-guided intra-articular triamcinolone injection can be considered as an additional treatment for hip osteoarthritis.
2.	Ertürk, et al. ¹¹ (2016)	Turkey	RCT	70	The study included 70 patients with knee osteoarthritis, divided into two groups: one receiving intraarticular hyaluronic acid alone (n=35) and the other receiving hyaluronic acid combined with a single corticosteroid-lidocaine injection (n=35). Injections were administered to the most painful

					areas, and outcomes were assessed using VAS pain scale, WOMAC, and HSS knee scores at multiple time points up to 52 weeks. Group 2 showed significantly better scores in the first three weeks ($p < 0.01$), but no significant differences were observed at later follow-ups. The combined treatment may provide earlier pain relief and faster return to daily activities, making it a useful adjunctive therapy.
3.	Rampal, et al. ¹² (2022)	Malaysia	Retrospective study	-	Intraarticular corticosteroids provide effective pain relief for hip osteoarthritis, but repeated injections should be avoided, and hip arthroplasty should be delayed for at least three months after injection. They are typically combined with lidocaine or bupivacaine, though the chondrotoxic effects of local anesthetics are a concern. While national guidelines do not recommend hyaluronic acid for hip OA, some studies support its use for moderate cases. PRP, MSC, and BMAC show potential but lack conclusive evidence. There is a risk of septic arthritis, emphasizing the need for strict aseptic precautions.
4.	Paskins, et al. ¹³ (2020)	UK	RCT	199	The study recruited 199 participants (43% male, mean age 63 years), with high follow-up completion rates. BCT plus ultrasound-guided triamcinolone/lidocaine injection significantly improved hip pain intensity over six months compared to BCT alone (-1.43, 95% CI -2.15, -0.72), with the greatest benefits at two weeks and two months. Functional improvements and pain self-

					efficacy were also greater in the triamcinolone/lidocaine group. More participants in this group reported feeling completely recovered or much better at two months (45.4% vs. 6.9%). No significant difference in pain relief was found between triamcinolone/lidocaine and lidocaine-only groups, though triamcinolone/lidocaine showed better secondary outcomes. One possible treatment-related death occurred due to endocarditis. The triamcinolone/lidocaine treatment was cost-effective, leading to lower healthcare costs and higher quality-adjusted life-years (QALYs). The lack of significant pain difference between the two injection groups suggests a possible placebo effect.
5.	Kigozi, et al. ¹⁴ (2025)	UK	RCT	133	BCT plus ultrasound-guided triamcinolone (BCT+US-T) was associated with lower NHS costs (£161.6 less on average) and a small but significant increase in quality-adjusted life-years (QALYs) compared to BCT alone over six months. Cost differences were mainly due to fewer NHS consultant visits, private physiotherapy, chiropractic sessions, and hip surgeries in the BCT+US-T group. Overall, BCT+US-T was the most cost-effective option, providing better outcomes at a lower cost than BCT alone.
6.	Park, et al. ¹⁵ (2015)	Korea	Retrospective study	98	Both intra-articular ketorolac and corticosteroid injections improved Harris hip scores and pain levels at 1, 3, and 6 months, with no significant differences between the groups. Success rates were similar across all time points. Logistic

					regression and univariate analysis showed that factors like age, gender, pain duration, and disease severity were not independent predictors of treatment success. The study concludes that ketorolac injections are as effective as corticosteroids for hip osteoarthritis and may be a viable alternative for patients who cannot use corticosteroids.
7.	Ming, et al. ¹⁶ (2022)	Korea	RCT	66	Sixty-six knees were studied, with two lost to follow-up. Pain scores improved in both groups at 1 hour, with better results for IASLI at 1 month and ACB at 3 months. Lower limb function and quality of life also improved, with IASLI showing better outcomes at 1 month and ACB at 3 months. ACB provided longer-lasting pain relief, leading to improved function and quality of life in chronic knee osteoarthritis patients up to 3 months, with no significant side effects.
8.	Brookes, et al. ¹⁷ (2024)	UK	Retrospective study	1464	The study found that fluoroscopy-guided intra-articular corticosteroid injections (FG-IACSI) had slightly better effect sizes ($g = 2.61$ and 2.46) than ultrasound-guided injections (USG-IACSI) for pain relief at one month. Heterogeneity was low in USG studies but high in FG studies. Both methods effectively reduced pain, but further high-quality trials are needed to determine the superior guidance technique.

DISCUSSION

The use of corticosteroid and lidocaine injections for hip osteoarthritis (OA) has been widely studied as a non-surgical option for pain management. The effectiveness of this treatment modality has been demonstrated in multiple randomized controlled trials (RCTs) and retrospective studies. Paskins et al. (2022) found that the combination of best current treatment (BCT) with ultrasound-guided triamcinolone-lidocaine injections led to significantly greater pain reduction over six months compared to BCT alone. The mean difference in pain scores was -1.43 ($P<0.001$), particularly benefiting patients with synovitis or joint effusion. However, no significant difference was observed when compared to lidocaine-only injections, suggesting a potential placebo effect.¹⁰

Further supporting this, Paskins et al. (2020) found that patients receiving corticosteroid-lidocaine injections experienced the greatest pain relief within the first two months, with 45.4% reporting feeling completely recovered or much better compared to 6.9% in the BCT-only group. Functional improvements and pain self-efficacy were also significantly higher in the corticosteroid group, emphasizing the short-term benefits of this intervention. However, long-term efficacy remains unclear, as improvements diminished beyond the six-month period.¹³

The safety of corticosteroid and lidocaine injections for hip OA remains a concern, particularly regarding long-term joint health. Rampal et al. (2022) advised against repeated injections, highlighting the potential for cartilage degradation and recommending a minimum interval of three months between injections and hip arthroplasty. Additionally, corticosteroids, when combined with local anesthetics such as lidocaine or bupivacaine, pose a risk of chondrotoxicity. While rare, the risk of septic arthritis is also present, emphasizing the need for strict aseptic techniques during administration.¹²

One notable adverse event was reported in the study by Paskins et al. (2022), where a patient in the corticosteroid group developed bacterial endocarditis and subsequently died. Although the causal relationship remains uncertain, this finding highlights the importance of monitoring for systemic infections post-injection.¹² Despite this, Kigozi et al. (2025) found that BCT plus corticosteroid injections

resulted in lower healthcare costs and higher quality-adjusted life-years (QALYs) compared to BCT alone, reinforcing the treatment's cost-effectiveness.¹⁴

Regarding optimal dosing, studies typically used triamcinolone acetonide in doses ranging from 40 mg to 80 mg, combined with 1% lidocaine or 0.5% bupivacaine. Rampal et al. (2022) emphasized that lower doses may be preferable to minimize the risk of cartilage damage while still providing effective pain relief. However, specific dosing recommendations remain variable and should be tailored to individual patient needs and response to treatment.¹²

Comparing corticosteroids to alternative intra-articular injections, Park et al. (2015) found that ketorolac injections provided similar pain relief and functional improvements as corticosteroids over six months. This suggests that non-steroidal anti-inflammatory drug (NSAID) injections may be a viable alternative for patients with contraindications to corticosteroids.¹⁵ Similarly, Ertürk et al. (2016) demonstrated that a combination of corticosteroid-lidocaine and hyaluronic acid provided earlier pain relief than hyaluronic acid alone, though long-term benefits were not sustained.¹¹

Guidance techniques also influence the effectiveness of injections. Brookes et al. (2024) found that fluoroscopy-guided intra-articular corticosteroid injections (FG-IACSI) had slightly greater effect sizes than ultrasound-guided injections (USG-IACSI) for pain relief at one month. However, heterogeneity was high in FG studies, and both methods proved effective. Given the lower radiation exposure and wider availability of ultrasound, USG remains a preferred technique for many clinicians.¹⁷

In terms of long-term outcomes, corticosteroid injections may provide temporary symptom relief but do not alter the progression of hip OA. Ming et al. (2022) found that while intra-articular steroid injections improved pain and function in knee OA, effects were not sustained beyond three months. This aligns with findings in hip OA, where corticosteroid benefits diminish over time. Thus, these injections should be viewed as a short-term intervention rather than a definitive treatment.¹⁶

Overall, corticosteroid and lidocaine injections remain a valuable option for short-term pain relief in hip OA, particularly for patients with synovitis or effusion.

However, concerns regarding long-term joint health, infection risks, and diminishing efficacy over time suggest that these injections should be used judiciously. Further high-quality trials are needed to establish the optimal dosing, frequency, and patient selection criteria for maximizing benefits while minimizing risks.¹⁸

Future research should focus on comparing corticosteroid injections with emerging regenerative therapies such as platelet-rich plasma (PRP) and mesenchymal stem cell (MSC) injections. While PRP, MSC, and bone marrow aspirate concentrate (BMAC) show potential, evidence remains inconclusive. Identifying patient subgroups that derive the most benefit from corticosteroid-lidocaine injections and alternative therapies will be essential for advancing the management of hip OA.⁴

CONCLUSION

Overall, corticosteroid and lidocaine injections remain a valuable option for short-term pain relief in hip OA, particularly for patients with synovitis or effusion. However, concerns regarding long-term joint health, infection risks, and diminishing efficacy over time suggest that these injections should be used judiciously.

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