

Evaluation of Intra-articular Corticosteroid Injections in Patients with Sacroiliac Pain

Abstract

Background: Sacroiliac pain is one of the causes of low back pain, representing with discomfort and tenderness in the sacroiliac joint. Interventional procedures might be beneficial in cases unresponsive to medical treatments. Here, we aimed to investigate the effects of intra-articular corticosteroid injections in patients with sacroiliac pain. **Materials and Methods:** This is a clinical trial performed in 2017–2018 in Kashani Hospital, Isfahan, on patients with low back pain and formerly diagnosed with sacroiliac pain. Patients were recruited based on inclusion and exclusion criteria. Corticosteroid injections were performed for patients. Patients were visited within 2 weeks, 4 weeks, and 6 months after interventions, and pain and disabilities of patients were assessed using the numerical rating scale (NRS) and Oswestry Disability Questionnaire. **Results:** A total number of 27 patients entered our clinical trial. We showed that the mean NRS score among patients before interventions was 8.01 ± 0.96 . Assessments of disability score also indicated that the mean disability scores was 41.48 ± 7.48 . Our data also indicated that there was a significant reducing trend in both NRS and disability score after interventions ($P < 0.001$ for both items). **Conclusion:** Intra-articular steroid injection is associated with significantly reduced pain and disability in patients with sacroiliac pain. Previous studies evaluated variable methods and reported that this method has high values and significant advantages compared with other techniques which were in line with our results.

Keywords: *Corticosteroids, pain, Sacroiliac Joint*

Introduction

Low back pain is one of the most common issues among adults.^[1] Different etiologies are known to cause low back pain. Disk herniation, trauma, neoplasms, and musculoskeletal issues are some of the common etiologies. Pain in the sacroiliac joint has been shown to cause almost 10%–27% of chronic low back pain with unknown origin.^[2,3] Pain in the sacroiliac joint is also more common among patients with gout, rheumatoid arthritis, ankylosan spondylitis, psoriasis, trauma, and neoplasms and patients with previous spine deformities.^[4-6] This issue is also common among pregnant women which is caused by relaxin hormone production.^[7] Deformities in lower extremities such as limb-length discrepancy or previous surgeries or even acute pain in one of the lower extremities cause an imbalance in weight-bearing in patients and therefore pain in the sacroiliac joint.^[8,9]

Clinical presentations of pain in the sacroiliac joint are mostly as discomfort

and tenderness in the sacroiliac joint with possible pain radiation to the back of thigh, buttocks, lumbar areas, and also groins.^[10] This pain might also imitate sciatica pain.^[11] Tenderness in the ipsilateral sacral sulcus, Faber test, Gaenslen's test, thigh thrust, gapping, and sacral trust are some other clinical tests that help physicians to localize or diagnose the etiology of sacroiliac pain.^[12] In a study by Hsu and others, they indicated that positive results for three or more of the mentioned tests have 82%–94% sensitivity and 57%–79% specificity for the diagnosis of sacroiliac pain.^[13]

Different therapeutic methods have been used to relieve sacroiliac pain. Ice compression, physiotherapy, and nonsteroidal anti-inflammatory drugs (NSAIDs) are the most common treatments for sacroiliac pain.^[14] Intra-articular corticosteroid injection is also another treatment method for sacroiliac pain, especially in patients unresponsive to noninvasive treatments.^[15] It is also important to mention that this method is performed under special conditions.

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Different studies have investigated and evaluated the intra-articular corticosteroid injection methods and most of these studies declared positive effects.^[8,16] There are also some paradoxical reports for the effectiveness of this method. The effectiveness of intra-articular corticosteroid injection has been indicated in some previous studies, while on the other hand, previous systematic reviews showed that this therapeutic method has low or medium beneficial effects. In a cohort study by Althoff *et al.*, they indicated that computed tomography (CT)-guided corticosteroid injection for sacroiliac pain significantly relieves the pain in patients for at least 6 months.^[17] On the other hand, Hansen and others evaluated 11 clinical trials and showed that there is still a lack of sufficient evidence about both short-term and long-term effectiveness of intra-articular corticosteroid injection for patients with sacroiliac pain.^[18]

These data could emphasize the possible effectiveness of intra-articular corticosteroid injection as a therapeutic method for sacroiliac pain. There is still doubt about possible therapeutic effects of this method and as a result, here in the present study, we aimed to investigate the beneficial effects and effectiveness of this method among patients referring to Kashani Hospital in Isfahan.

Materials and Methods

This is a single-arm clinical trial that was performed in 2017–2018 in Kashani Hospital, Isfahan. The current study was performed on patients with low back pain referred to Kashani Hospital with a diagnosis of sacroiliac pain from April 2017 to May 2018. The study protocol was approved by the Ethical Committee of Isfahan University of Medical Sciences (Ethics code: IR. MUI. MED. REC.1397.114) and was also registered in the Iranian Registry of Clinical Trials with the code of IRCT20200217046523N4.

Our inclusion criteria were signing the informed consent, age between 21 and 70 years, low back pain for at least 6 months before patient's referral, no significant response to physiotherapy and other noninvasive-medical treatments, relief of the pain for at least 50% within 30 min after diagnostic intra-articular block using 0.5 ml of lidocaine 2%, and positive results for at least one of the following tests: tenderness in the sacroiliac ligament, positive Gaenslen test, positive Patric test. Our exclusion criteria were any special condition in which intra-articular infections are contraindicated, vertebral disk herniation, radiculopathy, neuropathy, myopathy, endometriosis, diagnosed psychological diseases, being under treatments with anticoagulants, addiction, any benign to malignant tumors, and relief of the pain for <50% within 30 min after diagnostic intra-articular block using 0.5 ml of lidocaine 2%.

Patients were recruited based on inclusion and exclusion criteria. Demographic data including age, weight, height, and body mass index (BMI) of patients were collected

and clinical examinations were performed. Corticosteroid injections were performed as following: injection site was first sterilized and covered. The position of the patients was prone in this procedure. Four ml of lidocaine 1% was injected in the injection site using a number 22 needle. C-arm was positioned within 40°–50° and intra-articular injections were performed using a number 26 needle under fluoroscopy guidance. Before injections, 1 ml of iohexol was injected to confirm that the needle in intra-articular space. 0.5 ml lidocaine 2% was first injected in intra-articular space to assess patient's pain relief using the numerical rating scale (NRS) and patients with <50% pain relief were excluded. In patients with confirmed sacroiliac pain, 10 mg triamcinolone was then injected into the articular space. The needle was then removed and pressure bandage was administered for all patients.

The patient's pain was assessed during the study using NRS^[19] and the patient's disabilities due to sacroiliac pain were assessed by the Oswestry Disability Questionnaire.^[20] NRS evaluates the patient's pain by scoring from 0 (no pain) to 10 (most severe pain). Oswestry Disability Questionnaire consists of 10 parts each having 5 scores. These parts evaluate different scopes in patient's daily activities including lifting heavy objects, personal activities, walking, sitting, intercourse, standing up, social activities, sleeping, and traveling. Scores before and after the treatments were evaluated and compared. Improvements in scores for more than 10% were assessed as acceptable responses and improvements <10% were assessed as a partial response.^[21]

Patients were visited within 2 weeks, 4 weeks, and 6 months after interventions, and pain and disabilities of patients were assessed. Data were collected and analyzed using Statistical Package for Social Sciences (SPSS) for Windows (version 18.0; SPSS Inc., Chicago, IL, USA).

Results

In this study, 31 patients entered based on inclusion criteria. Four patients were excluded due to addiction (one patient), anticoagulant consumption (one patient), and irregular follow-up (two patients). A total number of 27 patients entered our clinical trial. Our study population consisted of 18 males (66.7%) and 9 females (33.3%). The mean age of patients was 55.77 ± 8.88 years (from 41 to 77 years). Our measurements indicated that the mean BMI in patients was 29.37 ± 4.02 kg/m².

We showed that the mean NRS score among patients before interventions was 8.01 ± 0.96 . Assessments of disability score also indicated that the mean disability score was 41.48 ± 7.48 . Based on the repeated measure ANOVA test, there was a significant reducing trend in NRS after interventions. We also indicated that the disability scores in patients reduced significantly within our visits. These data are indicated in Table 1. Figure 1 shows changes in NRS and disability scores during our study. We should also note

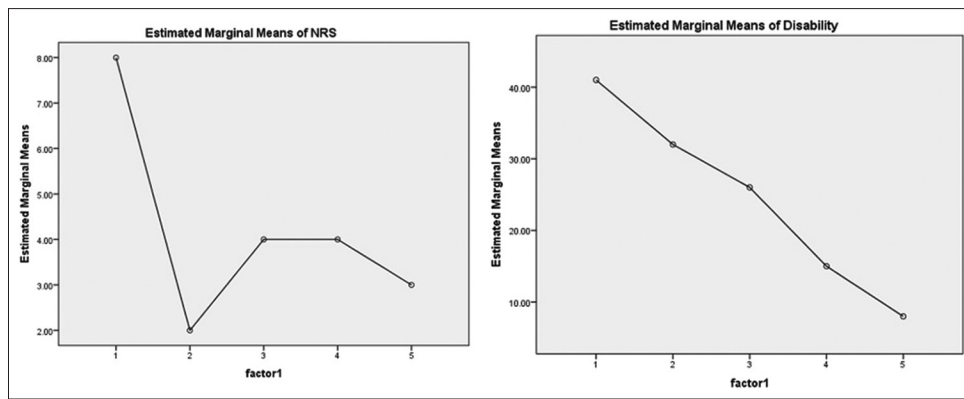


Figure 1: Changes in numerical rating scale and disability score during our study

Table 1: Changes in mean numerical rating scale and disability score during different visits among patients

Variable	Before interventions	Immediately after interventions	Within 2 weeks	Within 4 weeks	Within 6 months	P
NRS	8.01±0.96	2.81±1.24	4.85±0.66	4.11±0.75	3.70±0.60	<0.001
Disability score	41.48±7.48	32.88±8.11	26.07±6.51	15.25±2.12	8.96±3.19	<0.001

NRS: Numerical rating scale

that no side effects or complications were reported among our study population within 6-month follow-ups.

Discussion

In the present study, we evaluated the effects of corticosteroid intra-articular injections on 27 patients with sacroiliac pain. We indicated that the pain and disabilities of patients reduced significantly after injections. We should also note that patients had a significant reducing trend for pain and disability scores within 6 months after interventions. Different lines of evidence have assessed variable therapeutic methods for sacroiliac pain. Corticosteroid injections for sacroiliac pain were assessed in a review article by Chou and others in 2015. They evaluated 78 randomized trials and showed that intra-articular and epidural injections of corticosteroid are associated with immediate improvements in pain and might be associated with immediate improvements in function, but further studies are required.^[22]

Another study by Maugars *et al.* showed that intra-articular injections of corticosteroids are beneficial and effective methods for pain relief in patients with sacroiliac pain, especially when unresponsive to other medical agents such as NSAIDs.^[23] These results are also in line with the findings of our study. We indicated that intra-articular steroid injection is an effective and beneficial method for reducing pain and disabilities in patients. Kim and others also declared that intra-articular prolotherapy might be more effective than steroid injections, but this method requires further studies on larger populations.^[24]

Jee *et al.* have compared short-term effects and safety of ultrasound (US)-guided sacroiliac joint injections with fluoroscopy-guided injections in 120 patients

with sacroiliac pain and declared that the use of US in intra-articular injection in sacroiliac pain might be a feasible and functional approach, but the accuracy of fluoroscopy-guided injections is higher and might bring better short-term results.^[25] This study emphasizes the beneficial effects of intra-articular injections for sacroiliac pain which was utilized in our experiments. In another study by Slipman and others which was performed in 2001 on 31 patients, they indicated that using fluoroscopically for therapeutic sacroiliac joint injections is highly effective and is associated with valuable results for patients.^[26] These results indicate efficacies of imaging-guided intra-articular injections, especially CT-guided intra-articular injections, for sacroiliac pain. In the present study, we utilized this method for corticosteroid injections in 27 patients with sacroiliac pain.

In a review article by Kennedy *et al.* in 2015, 45 articles about diagnostic and therapeutic methods of sacroiliac pain were evaluated and they concluded that image-guided intra-articular diagnostic injections of local anesthetics are effective methods of diagnosing sacroiliac pain and might also contribute to the prediction of responses to therapeutic agents in patients.^[27] This is also in line with what we showed. Using lidocaine 2%, we indicated that the patients have sacroiliac pain and we also showed that both pain and disability scores decreased significantly following corticosteroid injections in the sacroiliac joint.

Different therapeutic methods and techniques have been shown for sacroiliac pain. Murakami *et al.* evaluated the effects of periarticular and intra-articular lidocaine injections for sacroiliac joint pain among 50 patients. They indicated that periarticular lidocaine injections are more effective compared with intra-articular injections for pain relief in patients.^[28] This method could be a novel and

effective technique in sacroiliac pain treatments, but the most important difference between our study and the study by Murakami and others is that we used intra-articular lidocaine injections for definite diagnosis of sacroiliac pain and, on the other hand, we injected corticosteroids for treatments of sacroiliac pain and reported a statistically significant decrease in pain and disabilities in patients.

Minimally invasive sacroiliac arthrodesis was performed by Wise and Dall on 13 patients with sacroiliac pain. They showed that this technique is also safe and is associated with high fusion rates and improvements of symptoms among patients.^[29] As previous studies showed, an intra-articular steroid injection is associated with effective pain relief in patients with sacroiliac pain and brings significant beneficial results which were also in line with the present study. The limitations of the current study were restricted number of patients and also not measuring patient's function and quality of life. We suggest that more studies should be performed in this regard.

Conclusion

Taken together, we showed that the intra-articular steroid injection is associated with significantly reduced pain and disability in patients with sacroiliac pain. Previous studies evaluated variable methods and reported that this method has high values and significant advantages compared with other techniques which were in line with our results.

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Conflicts of interest

There are no conflicts of interest.

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