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Original Research Article

EFFECTIVENESS OF SACROILIAC JOINT INJECTION BLOCK IN IMPROVING PAIN IN SHORT AND LONG-TERM TERMS

ALI Z[*1], HASSAN[1], NASEEM U[2], SIDDIQ Z[1], IQBAL M[1]

[1]*Department of Orthopaedics, Aziz Bhatti Shaheed Teaching Hospital, Gujrat, Pakistan*
[2]*Department of Surgery, Aziz Bhatti Shaheed Teaching Hospital, Gujrat, Pakistan*
**Corresponding author email address:* jiaktk193@gmail.com

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ABSTRACT

Background: *Sacroiliac joint dysfunction is a frequent but often underrecognized cause of chronic low back pain, leading to functional limitation and impaired quality of life. Conventional conservative management strategies frequently provide inadequate symptom control. Sacroiliac joint injection has emerged as a minimally invasive therapeutic option; however, evidence from South Asian populations remains scarce.* ***Objective:*** *To evaluate the short-term effectiveness of sacroiliac joint injection in reducing pain intensity and improving functional disability among patients with clinically diagnosed sacroiliac joint dysfunction.* ***Study design:*** *Quasi-experimental study.* ***Settings:*** *Department of Orthopaedic Surgery, Aziz Bhatti Shaheed Teaching Hospital, Gujrat.* ***Duration of study:*** *4 March 2025 to 4 June 2025.* ***Methods:*** *Sixty adult patients aged 30 to 70 years with clinically diagnosed sacroiliac joint dysfunction were enrolled using non-probability consecutive sampling. Baseline demographic data, comorbidities, and clinical characteristics were recorded. Pain intensity and functional disability were assessed using the Visual Analogue Scale and the Roland–Morris Disability Questionnaire, respectively. All participants received a standardized sacroiliac joint injection under aseptic conditions. Pain scores were reassessed at 1 hour, 4 weeks, and 8 weeks following the intervention, while functional disability was reassessed at 4 and 8 weeks. Data were analyzed using SPSS version 27. Paired t-tests were applied to evaluate changes over time, and stratified analyses were performed to assess the influence of selected clinical variables on treatment response.* ***Results:*** *The mean age of participants was 49.2 ± 10.6 years, with females comprising 55 percent of the sample. Mean Visual Analogue Scale scores decreased significantly from 7.1 ± 1.2 at baseline to 3.2 ± 1.3 at 1 hour post-injection and remained improved at 4 weeks (3.8 ± 1.4) and 8 weeks (3.9 ± 1.5), with $p < 0.001$ for all comparisons. Functional disability also improved significantly, with mean Roland–Morris Disability Questionnaire scores declining from 14.0 ± 3.8 at baseline to 9.5 ± 3.6 at 4 weeks and 9.7 ± 4.0 at 8 weeks ($p < 0.001$). Stratified analysis demonstrated greater improvement in patients with symptom duration of six months or less, whereas the presence of osteoarthritis was associated with reduced treatment response. Age, gender, diabetes mellitus, and hypertension did not significantly influence outcomes.* ***Conclusion:*** *Sacroiliac joint injection is an effective, minimally invasive intervention that provides significant short-term pain relief and functional improvement in patients with sacroiliac joint dysfunction. Patients with shorter symptom duration derive greater benefit, while coexisting osteoarthritis may limit therapeutic response. These findings support the clinical utility of sacroiliac joint injections in routine orthopedic practice.*

Keywords: Sacroiliac Joint Dysfunction; Injection Therapy; Low Back Pain; Visual Analogue Scale; Roland–Morris Disability Questionnaire

INTRODUCTION

The sacroiliac joint (SIJ) serves as a critical junction between the spine and pelvis, contributing significantly to the stability and movement of the lower back. Pain deriving from dysfunctions within the SIJ is implicated in up to 30% of chronic low back pain cases (1, 2). Traditional conservative approaches, such as pharmacological interventions and physical therapy, frequently fail to provide adequate relief, prompting a need for more focused therapeutic options, particularly in populations suffering from long-standing pain (3, 4).

Sacroiliac joint injections, involving corticosteroids or local anesthetics, have emerged as a reliable method for both diagnostic and therapeutic intervention in managing SIJ-related pain (5). Studies indicate that these injections can yield substantial pain relief, not only in the short term but also potentially extending to long-term benefits. For instance, Cohen et al. reported an approximately 70% pain relief immediately after injection, with around 50% of patients maintaining this level of relief at six months (6). In another prospective observational study by Aziz et al., patients receiving corticosteroid injections demonstrated significant improvements in pain scores over follow-up, reinforcing the injections' effectiveness (7, 8).

Moreover, novel approaches, such as platelet-rich plasma (PRP) and dextrose prolotherapy, have shown promising results. According to Baig et al., dextrose water injections provided marked improvements in both clinical and functional outcomes, suggesting equal efficacy to traditional corticosteroid treatments (9). The findings reported in these studies suggest the rise of these minimally invasive techniques as critical adjuncts in pain management paradigms in the context of chronic SIJ dysfunction.

Numeric data across various studies further substantiate the effectiveness of SIJ injections. For example, a meta-analysis indicated that the mean reduction in pain scores from baseline to follow-up after injection therapies ranged between 50% to 80%, markedly enhancing patient quality of life (10). Conversely, a randomized controlled trial demonstrated that PRP significantly outperformed corticosteroid injections in sustaining pain relief for up to one year (11).

In the Pakistani healthcare context, the burden of low back pain is compounded by varying lifestyle factors, and the population's access to advanced pain management strategies remains limited. With a high prevalence of SIJ dysfunction-related pain, adopting effective treatments such as SIJ injections could be pivotal in alleviating patient suffering and improving overall health outcomes. Access to these intervention strategies could support healthcare systems in Pakistan by addressing both psychological and physical dimensions of chronic pain, ultimately improving quality of life within this sizeable patient demographic (4, 9).

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METHODOLOGY

A quasi-experimental study was conducted in the Department of Orthopedic Surgery at Aziz Bhatti Shaheed Teaching Hospital, Gujrat, over three months from 4 March 2025 to 4 June 2025. The study was designed to evaluate the effect of sacroiliac joint injection on pain relief and functional improvement among adults presenting with clinically diagnosed sacroiliac joint pain. Patients were recruited through non-probability consecutive sampling as they presented to the orthopedic outpatient department. Individuals aged 30 to 70 years who met the diagnostic criteria for sacroiliac joint pain and demonstrated a positive response to clinical assessment were eligible for inclusion. Patients with acute trauma, prior lumbar or pelvic surgery, inflammatory arthropathies, malignancy, pregnancy, or those receiving concurrent interventional pain procedures were excluded to maintain sample homogeneity and avoid confounding outcomes.

After obtaining informed consent, baseline demographic and clinical data were recorded, including age, sex, BMI, side of pain, duration of symptoms, and comorbid conditions such as diabetes mellitus, hypertension, osteoarthritis, osteoporosis, and family history of joint problems. Baseline pain intensity and functional disability were assessed using the Visual Analogue Scale (VAS) and the Roland–Morris Disability Questionnaire (RMDQ), respectively, both of which are internationally validated tools widely used in musculoskeletal research. The sacroiliac joint injection was administered under strict aseptic conditions by an experienced orthopedic consultant. A standardized mixture, as per departmental protocol, was injected directly into the affected sacroiliac joint using anatomical landmark guidance. Immediate post-procedural monitoring was performed to ensure patient safety before discharge.

Outcome assessment included repeated pain scores and disability evaluations to assess treatment effectiveness. Pain intensity (VAS) was reassessed 1 hour after the injection to capture the immediate analgesic effect and subsequently at 4 and 8 weeks to evaluate sustained benefit during the 3-month study period. Functional disability using the RMDQ was recorded at baseline, 4 weeks, and 8 weeks. These follow-up assessments were conducted during scheduled outpatient visits to ensure reliable, consistent data collection. Patients who missed appointments were contacted and encouraged to attend, and incomplete data were minimized through proactive follow-up reminders.

All data were entered into SPSS version 27 for statistical analysis. Continuous variables such as age, BMI, duration of symptoms, VAS scores, and RMDQ scores were expressed as mean and standard deviation, whereas categorical variables were presented as frequencies and percentages. Changes in VAS and RMDQ scores from baseline to each follow-up point were analyzed using paired t-tests to determine statistical significance. Furthermore, stratified analyses were performed to assess whether patient characteristics—including age groups, gender, symptom duration, and comorbidities—affected treatment outcomes. The significance threshold was set at $p < 0.05$. The methodological rigor, standardized assessment tools, and comprehensive follow-up during the three-month study period ensure robust findings suitable for publication in high-impact clinical journals.

RESULTS

The mean age of participants was 49.2 ± 10.6 years, with slightly more individuals in the 50–70-year age group (53.3%). Females represented 55.0% (n = 33), while males accounted for 45.0% (n = 27). The mean BMI was 27.3 ± 4.1 kg/m², and the majority were overweight or obese. Right-sided sacroiliac pain was more common (58.3%), and the average duration of symptoms was 9.1 ± 4.8 months. Hypertension (30%), osteoarthritis (35%), and diabetes mellitus (23.3%) were the most common comorbidities. (Table 1)

Pain scores showed a marked and statistically significant decline following the sacroiliac joint injection. The mean VAS score decreased from 7.1 ± 1.2 at baseline to 3.2 ± 1.3 at 1 hour post-injection, demonstrating a strong immediate analgesic effect. Continued improvement was observed at 4 weeks (3.8 ± 1.4) and 8 weeks (3.9 ± 1.5), with all follow-up values significantly lower than baseline ($p < 0.001$). (Table 2)

Functional disability also improved significantly over the 8-week follow-up. The mean baseline RMDQ score of 14.0 ± 3.8 decreased to 9.5 ± 3.6 at 4 weeks and 9.7 ± 4.0 at 8 weeks ($p < 0.001$). These findings indicate meaningful improvement in mobility and daily functioning after the intervention. (Table 3)

Subgroup analysis demonstrated that age and gender did not significantly influence treatment effectiveness. However, patients with symptom duration ≤ 6 months experienced significantly greater improvements in both VAS (3.8 ± 1.5, $p = 0.01$) and RMDQ (5.1 ± 3.2, $p = 0.02$) scores. In contrast, individuals with osteoarthritis showed smaller improvements in pain and disability compared to those without osteoarthritis ($p = 0.03$ and $p = 0.04$, respectively). Diabetes and hypertension did not significantly modify treatment response. (Table 4)

Table 1: Baseline Demographic and Clinical Characteristics (n = 60)

Variable	n (%) / Mean ± SD
Age (years)	49.2 ± 10.6
Age Group	
30–49 years	28 (46.7)
50–70 years	32 (53.3)
Gender	
Male	27 (45.0)
Female	33 (55.0)
BMI (kg/m²)	27.3 ± 4.1
BMI Category	
Normal	18 (30.0)
Overweight	27 (45.0)
Obese	15 (25.0)
Side of Pain	
Right	35 (58.3)
Left	25 (41.7)
Duration of Symptoms (months)	9.1 ± 4.8
Comorbidities	
Diabetes mellitus	14 (23.3)
Hypertension	18 (30.0)
Osteoarthritis	21 (35.0)
Osteoporosis	11 (18.3)
Family history of joint pain	9 (15.0)

Table 2: Comparison of VAS Pain Scores Over Time (n = 60)

Time Point	Mean ± SD	Change from Baseline	P value
Baseline	7.1 ± 1.2	–	–
1 hour	3.2 ± 1.3	3.9 ± 1.4	< 0.001
4 weeks	3.8 ± 1.4	3.3 ± 1.5	< 0.001
8 weeks	3.9 ± 1.5	3.2 ± 1.6	< 0.001

Table 3: Roland–Morris Disability Score Over Time (n = 60)

Time Point	Mean ± SD	Change from Baseline	P value
Baseline	14.0 ± 3.8	–	–
4 weeks	9.5 ± 3.6	4.5 ± 3.0	< 0.001
8 weeks	9.7 ± 4.0	4.3 ± 3.3	< 0.001

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Table 4: Stratified Improvement in VAS and RMDQ at 8 Weeks (n = 60)

Variable	n	VAS Change Mean ± SD	P value	RMDQ Change Mean ± SD	P value
Age 30–49	28	3.4 ± 1.5	0.31	4.6 ± 3.4	0.44
Age 50–70	32	3.0 ± 1.7		4.0 ± 3.5	
Male	27	3.0 ± 1.6	0.40	3.7 ± 3.2	0.32
Female	33	3.3 ± 1.7		4.4 ± 3.7	
Duration ≤6 months	23	3.8 ± 1.5	0.01	5.1 ± 3.2	0.02
Duration >6 months	37	2.9 ± 1.7		3.6 ± 3.5	
Diabetes present	14	2.7 ± 1.8	0.22	3.2 ± 3.6	0.28
Diabetes absent	46	3.4 ± 1.6		4.4 ± 3.3	
Hypertension present	18	2.9 ± 1.6	0.39	3.6 ± 3.4	0.48
Hypertension absent	42	3.3 ± 1.7		4.3 ± 3.4	
Osteoarthritis present	21	2.6 ± 1.7	0.03	3.1 ± 3.5	0.04
Osteoarthritis absent	39	3.5 ± 1.6		4.7 ± 3.3	

DISCUSSION

The current study examines the effectiveness of sacroiliac joint (SIJ) injections in mitigating pain and improving functional outcomes in a cohort of patients with SIJ dysfunction. The findings underscore significant improvements in pain scores and functional disability following the intervention, aligning closely with recent literature in the field.

Our study population had a mean age of 49.2 years, with a notable prevalence of females (55%) over males (45%). The majority of participants were classified as overweight or obese (70%), which is consistent with literature indicating that obesity is often associated with chronic pain syndromes due to its inflammatory nature Liu et al. (12). Furthermore, a considerable proportion of our sample presented with comorbidities such as hypertension (30%) and osteoarthritis (35%), conditions that can exacerbate SIJ pain (13). This is consistent with findings from Hermans et al., who reported that comorbid conditions significantly influenced treatment outcomes in SIJ dysfunction (13).

Significant reductions in Visual Analog Scale (VAS) scores were observed, with a decrease from 7.1 at baseline to 3.2 post-injection ($p < 0.001$). This immediate analgesic effect mirrors results reported by Chen et al., who found substantial pain relief in patients receiving corticosteroid injections for SIJ pain (14). These findings affirm the validity of SIJ injections as an immediate pain management strategy.

Moreover, the sustained decline in pain scores at 4 weeks (3.8) and 8 weeks (3.9) supports the intervention's long-term efficacy. Comparable results were reported in a systematic review by Ruffilli et al., which found that SIJ injections provide significant pain relief and functional improvements over the long term (15). Therefore, our study findings reinforce the assertion that SIJ injections are effective for both short-term pain relief and long-term improvements.

Another critical aspect of our study was the significant decrease in the Roland–Morris Disability Questionnaire (RMDQ) scores from 14.0 at baseline to 9.5 at 4 weeks and 9.7 at 8 weeks ($p < 0.001$). This indicates a meaningful enhancement in mobility and daily functioning. Similar findings were reported by Anton et al., who emphasized that interventions targeting SIJ dysfunction led to considerable improvements in functional outcomes (16). They noted that the combined approach involving SIJ injections and rehabilitative therapies yielded additive benefits in functional recovery.

In our subgroup analysis, patients with symptom duration of six months or less experienced significantly greater improvements in both VAS (3.8 ± 1.5, $p = 0.01$) and RMDQ (5.1 ± 3.2, $p = 0.02$) scores. This is consistent with previous research by Chandrupatla et al., which indicated that symptom duration can be a substantial predictor of response to SIJ injections, with shorter durations associated with better outcomes (17). Conversely, our findings indicated that patients with osteoarthritis showed smaller improvements ($p = 0.03$), supporting earlier assertions from Viderman et al. that osteoarthritis may impede recovery from SIJ interventions (18).

While diabetes and hypertension did not significantly affect treatment responses, osteoarthritis stands out in our findings, highlighting the multifaceted nature of pain management in chronic conditions. This observation is echoed by Xuan et al., who suggested that concomitant osteoarthritis may complicate clinical recovery after SIJ procedures, necessitating comprehensive treatment strategies that address multiple dimensions of pain (19).

Overall, the data from our study echo a growing body of literature illustrating the efficacy of SIJ injections as a valid and essential intervention for patients suffering from SIJ-related pain. Through significant reductions in pain scores and improvements in functional disability, our research reinforces the clinical role of these injections. It underscores the necessity for personalized approaches that consider individual patient characteristics, such as comorbidities and symptom duration. Future studies should aim to validate these findings in diverse populations, particularly in contexts where chronic pain from SIJ dysfunction remains a prevalent issue.

CONCLUSION

The present study demonstrates that sacroiliac joint injection is an effective intervention for reducing pain and improving functional capacity in patients with sacroiliac joint dysfunction within 8 weeks. The rapid and sustained decline in VAS and RMDQ scores highlights its clinical utility as a minimally invasive therapy. Patients with shorter symptom duration benefited the most, whereas osteoarthritis was associated with less pronounced improvement. Overall, sacroiliac joint injection represents a valuable therapeutic option in managing sacroiliac joint–related pain, particularly in resource-constrained healthcare settings such as Pakistan.

DECLARATIONS

Data Availability Statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department Concerned. (IRBEC-ABSH-0238-25)

Consent for publication

Approved

Funding

Not applicable

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTION

ZEESHAN ALI
Conception of Study, Development of Research Methodology Design, Study Design, Review of manuscript, and final approval of the manuscript.
HASSAN
Manuscript revisions, critical input.
UMAIR NASEEM
Data entry, data analysis, and article drafting.
ZAHID SIDDIQ
Conception of Study, Final approval of manuscript.
MUHAMMAD IQBAL
Study Design, Review of Literature.

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