

ORIGINAL ARTICLE

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Assessing the outcomes of Prp and corticosteroid injections for sacroiliac joint pain

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Abstract

Sacroiliac joint pain is a symptom that can affect the life activities of patients in daily life. Invasive methods also occupy an important place in the treatment of this symptom. Our study evaluated the follow-up results of patients injected with Platelet-rich plasma and steroids due to sacroiliac joint pain. Patient files between the years 2018-2022 were evaluated retrospectively. Patients who underwent ultrasound-guided sacroiliac joint injection of platelet-rich plasma and steroids were divided into 2 groups. VAS and The Modified Oswestry Disability Questionnaire scores were evaluated at 1, 3, and 6 months. Eighty-seven patients were included in the study. It was understood that patients in both groups benefited after injection ($p<0.001$). In the 1st month follow-up, it was concluded that the VAS and the Modified Oswestry Disability Questionnaire scores of the patient group who received steroids were significantly better ($p<0.001$). In the 3rd month, the VAS ($p=0.695$) and the Modified Oswestry Disability Questionnaire ($p=0.215$) scores of both groups were similar in both groups. In the 6th month, the platelet-rich plasma group's results were significantly better ($p<0.001$). Platelet-rich plasma and steroid injections are safe treatment methods for sacroiliac joint pain. Steroid injections in the short term and platelet-rich plasma injections in the long term are more effective.

Keywords: Platelet-rich plasma, Sacroiliac Joint, Corticosteroid, ultrasound guidance, injection, pain

Introduction

Sacroiliac joint pain usually presents as pain or discomfort in the lumbar region and over the hips. This pain may increase with activities such as moving, sitting or standing for a long time and decrease with rest. The severity of sacroiliac joint pain can vary from person to person and sometimes occur for no apparent reason.

There are many possible causes of this pain. Sacroiliac joint pain can be associated with various factors such as trauma, overload, inflammatory diseases, infections, hormonal changes or anatomical disorders [1].

The diagnosis can be made by clinical examination, evaluating

the patient's symptoms and radiological imaging methods. Reducing pain with local anesthetics applied to the joint area helps us diagnose [2]. Treatment usually begins with conservative methods and may include rest, pain relievers, physical therapy and exercise programs. More invasive treatments, such as injections, may be required in some cases.

Few publications in the literature compare the results of platelet-rich plasma (PRP) and corticosteroid injection in sacroiliac joint pain. Our study aimed to compare the clinical results of patients who underwent ultrasound-guided PRP and corticosteroids.

Material and Methods

The study was carried out with the permission of the Noninvasive

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Clinical Ethics Committee (Decision No:11-23,11.01.2022). Because the study was designed retrospectively, no written informed consent form was obtained from patients. In our retrospective study, patient files from a single center were examined. Patient files between 2018-2022 were scanned. Patients with complaints of unilateral sacroiliac joint pain for 3 months (VAS score >3), those with 3 or more positive provocation tests (sacral thrust, iliac distraction, iliac compression, thigh thrust, Patrick's test, and Gaenslen's test), patients who received PRP or corticosteroid injection and had a follow-up period of at least 6 months after the injection were included [3]. Patients under the age of 18, over the age of 65, with a history of spinal or pelvic surgery, with a history of radiculopathy, with a history of cancer, with spinal pathologies (such as scoliosis, vertebral fracture, spinal stenosis, spondylolisthesis), pregnant, active infection, diabetes, and patients with missing/suspicious information in their patient files were excluded from the study. The patients were divided into 2 groups: PRP (group P) and corticosteroid (group C). The group designated as Group C was given 1 ml of methylprednisolone (40 mg/ml) and 1 ml of prilocaine hydrochloride (20 mg/mL). The group designated as Group P was given 2 ml of PRP.

PRP preparation

The preparation and administration of platelet-rich plasma were performed in the same conditions in all patients, according to the method described by Anitua et al. [4,5]. A total of 30 ccs of peripheral blood was taken from the antecubital region; samples were taken into tubes containing 3.2% sodium citrate and an EDTA tube to measure the peripheral platelet count. The samples were centrifuged at 1500 rpm for 8 minutes at room temperature. 1 ml of the obtained PRP was sent to the laboratory for platelet count. Activated PRP (50 µl of Cl2 Ca per 1 ml of PRP) was applied under sterile conditions.

Injection protocol

All injections were made under sterile conditions under ultrasound guidance. It was made as described by Harmon et al. in the literature by using a Curvilinear transducer [6]. The patients were placed in the prone position while injecting. The

sacrum and ileum were determined by placing the transducer transversely. The sacroiliac joint was observed as a hypoechoic area between these 2 bones. Then, the injection was performed with the help of a 22-gauge needle under ultrasound guidance.

Follow-up protocol

Patients were evaluated before injection, 1 month, 3 months and 6 months after injection. VAS score and The Modified Oswestry Disability Questionnaire (MODQ) score were used during the evaluation.

When calculating the VAS score, patients are asked to score their pain between 0 and 10. 0 means I have no pain, and 10 means I have much pain.

MODQ consists of 10 questions and offers 6 options for each question. Each option represents the degree to which a particular activity or function can be performed. Its scoring is based on the individual's responses. The number of the selected option for each question is summed up, and the total score is calculated out of 100. A higher score indicates a greater effect of low back pain on activities of daily living.

Statistical analysis

Statistical analyses were performed using the Statistical Package of the Social Sciences (IBM SPSS 28.0.1.0; Corp., Armonk, NY, USA). The variables were investigated using visual (histograms, probability plots) and analytical methods (Kolmogorov-Simirnov/Shapiro-Wilk's test) to determine whether or not they are normally distributed. Descriptive analyses were presented using means and standard deviations for normally distributed variables.

The Student's t-test was used to compare the parameters. A p-value of less than 0.05 was considered to show a statistically significant result.

Results

Data from 102 patients were obtained. Considering the exclusion criteria, 87 patients were included in the study. Steroid injection was given to 45 patients and PRP to 42 patients. Demographic data and clinical evaluation results of the patients are given in Table 1.

Table1. Comparison of clinical outcomes and demographic characteristics of patient groups

	Group P (N: 42)	Group C (N: 45)	P value
Mean age±SD	50.7±6.9	52.5±7.2	0.459
Male/female	23/19	24/21	0.894
VAS-baseline	6.6±0.8	6.7±0.9	0.571
VAS-1 month	5.1±0.8	3.4±0.9	<0.001
VAS-3 months	3.7±1	3.8±0.8	0.695
VAS-6 months	2.3±1.4	4.6±1	<0.001
MODQ-baseline	47.3±9.3	48.2±9.1	0.656
MODQ-1 month	34.7±8.3	23.7±7	<0.001
MODQ-3 months	25.7±4.8	27.1±5.5	0.215
MODQ-6 months	11.9±4.9	32.3±8	<0.001

SD: standart deviation, N: number

In the evaluation, no statistically significant difference was found between Group P and Group C regarding age, gender, pre-injection VAS and MODQ scores. In the first-month measurements, VAS and MODQ scores were significantly higher in Group P. In the third month, both groups' VAS and MODQ scores were similar. In the evaluation made in the sixth month, the VAS and MODQ scores were found to be significantly higher in Group C (Table 1). Table 2 shows the Paired Sample T-test results. When the pre-injection VAS and MODQ values were compared with the post-injection values, it was determined that the results improved significantly in both groups 1st, 3rd and 6th months (Table 2).

Table 2. Comparison of functional results before and after injection with paired sample t-test

	P value	
	Group P	Group C
VAS-baseline & VAS-1 month	<0.001	<0.001
VAS-baseline & VAS-3 months	<0.001	<0.001
VAS-baseline & VAS-6 months	<0.001	<0.001
MODQ-baseline & MODQ-1 month	<0.001	<0.001
MODQ-baseline & MODQ-3 months	<0.001	<0.001
MODQ-baseline & MODQ-6 months	<0.001	<0.001

Discussion

Sacroiliac joint pain usually begins localized to the sacroiliac region. The pain then intensifies by spreading to the hip and lumbar region. Treatment is usually done conservatively. Conservative treatment also includes rest, pain relievers, physical therapy and exercise programs. More invasive treatments such as injections may be needed.

Injections are used as an alternative treatment method for sacroiliac joint pain. The evaluation made at the 1st, 3rd and 6th months after the injection showed that the patients benefited from the corticosteroid and PRP injections. As a result of the evaluations made in the 1st, 3rd and 6th months, when both groups were compared, it was determined that the patients who underwent PRP benefited more in the long term. The patients who received corticosteroids showed more benefit in the short term.

PRP has many uses in orthopedic disorders. Lateral epicondylitis, tendinopathies and osteoarthritis are a few of them [7-10]. Although PRP is a frequently used method, there is no consensus in the literature on PRP preparation, application frequency and application dose [11]. When we look at the treatment results of Wu et al. in lumbar facet arthropathy, 0.5 ml PRP was applied to the patients. During the preparation of PRP in these patients, it was centrifuged twice, at 200 and 400 rpm, for 10 minutes each [12]. In the study of Singla et al., patients who underwent sacroiliac joint injections were evaluated. In this study, patients were injected with 3mL PRP+0.5mL CaCl2. While preparing Prp, it was centrifuged once at 720 rpm for 15 minutes [3]. In

another study, 16.5 mL PRP was applied to patients diagnosed with degenerative lumbar spondylosis. In these patients, PRP was prepared by centrifuging once at 1568 rpm for 14 minutes [13]. In addition, corticosteroids are widely used in orthopaedics due to their mechanism of suppressing inflammation. These molecules easily pass through the cell membrane, causing changes at the DNA level [14]. When injected into the joint, it reduces synovial blood flow, suppresses local inflammation, and changes local collagen synthesis [3]. Many different agents such as triamcinolone hexacetonide/acetanide, methylprednisolone acetate, betamethasone acetate/sodium phosphate, and dexamethasone sodium phosphate are used in intra-articular injection [15]. There is no clear and precise information in the literature about which dose to apply and which agent to choose for this group of molecules frequently used in chronic low back pain [15].

When we look at the literature comparing the effectiveness of PRP and steroid in sacroiliac joint pain, In the study of Chen et al. on 26 patients, it was noted that improvement was observed in both groups in which PRP was applied at 1, 3, 6 months and steroid was applied. However, it was stated that more responses were obtained in the steroid group [16]. In another study by Singla et al., it was observed that the patients who were given steroids recovered in the early period, but the complaints gradually recurred in 3 months. Still, there was a gradual improvement up to the 3rd month in the prp group (3). In the study of Wu et al., the efficacy of PRP and local anesthetic + corticosteroid injection in lumbar facet joint syndrome was investigated. It has been concluded that both treatment methods are effective, easy and safe. However, it has been stated that PRP treatment is superior for long-term effectiveness [12]. In our study, similar to the literature, it was concluded that PRP and corticosteroid treatment were effective, but steroid treatment was more effective in the short term. Still, PRP was more effective in the long term.

Performing sacroiliac joint injections with imaging is important for injecting into the right place. In the literature, injections have been made under the guidance of USG or fluoroscopy [17]. These methods have advantages and disadvantages over each other. The fact that the fluoroscopy device is not in the outpatient clinic conditions it is usually in the operating room conditions and may require contrast agent injection can be counted among the disadvantages [18]. On the other hand, the fact that USG is portable and does not contain radiation can be counted among its advantages compared to fluoroscopy. Since the use of USG requires personal experience, it is relatively more difficult to use compared to fluoroscopy for the person who makes the injection. When we look at the literature, it has been shown in the study of Kennedy et al. that the failure rate to enter the sacroiliac joint with fluoroscopy varies between 4-20%. The study conducted by Soneji et al. concluded that the cases in which USG and fluoroscopy were used together with those in which fluoroscopy was used alone had similar efficacy [19]. In our study, the injection was performed under the guidance of USG due to its ease of use.

There are some complications encountered in sacroiliac joint injections. Injection-related pain, pruritis and hyperglycemia are a few of them [3,12]. No complications were found in our study. In addition, patients with positive findings in at least 3 of the provocation tests for sacroiliac joint pain were included in our study. In studies, positive results of 3 or more tests provided 94% sensitivity and 78% specificity [3].

There are some limitations of our study. First, it is a retrospective study, and the follow-up period is limited to 6 months. In addition, there is a need for patient groups that include PRP injections at different doses and intervals and steroid injections with different preparations.

Conclusion

In conclusion, PRP and steroid therapy are effective and safe methods for sacroiliac joint pain. While steroids improve symptoms in short periods, PRP injection is more effective in longer periods.

Conflict of Interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Ethical Approval

The ethics committee of Dicle University approved our study (11-23,11.01.2022).

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