COMPARISON OF ANALGESIC EFFICACY OF INTRA-ARTICULAR & PERI-ARTICULAR SACRO-ILIAC JOINT INJECTION IN PATIENTS WITH SACRO-ILIAC JOINT PAIN SYNDROME

Mudassar Iqbal, Amjad Iqbal, Liaquat Ali, Majid Waseem

Combined Military Hospital/National University of Medical Sciences (NUMS) Rawalpindi Pakistan

ABSTRACT

Objective: To compare the analgesic efficacy of intra-articular vs peri-articular sacroiliac joint (SIJ) injection in patients with sacroiliac joint pain syndrome.

Study Design: Prospective, randomized control trial.

Place and Duration of study: The study was conducted at the department of Pain Medicine, Combined Military Hospital (CMH) Rawalpindi, from Jul 2015 to Jun 2016.

Material and Methods: Forty eight patients of sacroiliac joint (SIJ) pain syndrome were randomly assigned into two equal groups. Group A (n=24) received intra articular SIJ injection of local anesthetic with steroid (Triamcinol one 40mg) under fluoroscopic guidance (drug volume 2.5) and group B (n=24) received Periarticular SIJ injection of local anesthetic with steroid (Triamcinolone 40mg) using land mark technique (drug volume 10ml). Pain score was assessed at 0 (Preprocedural baseline), 4, 8, and 12 week intervals after intervention by using numerical rating scale (NRS).

Results: Mean NRS pain score of group A was 7.5 ± 0.99 and 3.1 ± 1.6 at 0 and 12 week respectively. Mean NRS pain score of group B was 7 ± 1.10 and 5.55 ± 1.0 at 0 and 12 week respectively. A *p*-value <0.05 at 12 week between group A vs group B. There was a reduction in mean pain score from baseline to 12 week in both the groups but this reduction in mean pain score was statistically significant in group A as compared to group B.

Conclusion: Pain relief score was found to be statistically significant in fluoroscopic guided intra-articular technique as compared to peri-articular landmark technique for sacroiliac joint pain syndrome at 12 weeks post procedure.

Keywords: Analgesic efficacy, Intra-articular, Peri-articular, Sacroiliac joint.

INTRODUCTION

Lower back pain is among the common problems that most of the individuals suffer at some point in their lives having enormous impact on individuals, their families, and economy through out the world. The one year incidence of a first ever episode of back pain has been reported to range from 6.3% to 15.4%[1]. The global 1-month period prevalence of lower back pain is estimated to be 23.2% (± 2.9%)[2]. Sacro-iliac joint (SIJ) dysfunction constitutes 15-30% among different causes of low back pain[3]. Sacroiliac joint mediated pain is an illustrious entity which may cause discomfort within the lower back, buttock, groin and lower extremity[4]. It is sometimes difficult to establish that whether the symptoms arise from intra or extra-articular structures of sacroiliac joint. A retrospective analysis on confirmed cases of SI joint dysfunction disclosed that 44% of the cases were associated with a traumatic event, 21% were associated to accumulative trauma like repetitive lifting or altered gait mechanics, and 35% were idiopathic[5]. To diagnosed SI joint associated pain can be challenging for several reasons. Even we cannot make sure or confirmed SI joint pain on medical history and physical examination alone. Moreover, the patient's presenting symptoms can mimic different sources of low back pain. Special physical tests that assert stress to the SI joint are poorly validated, though a composite of multiple SI joint tests may improve sensitivity

Correspondence: Dr Mudassar Iqbal, OT and Pain Center, Combined Military Hospital Rawalpindi Pakistan
Email:mudassariqbalbhutta@gmail.com
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and specificity[6]. For example, in one report, a reported sensitivity of 93% and specificity of 78% were found, only when three or more of six diagnostic tests (distraction provocation test, Gaenslen's test, thigh thrust provocation test, sacral thrust test and compression provocation test) were positive, while other studies have not supported these findings[6,7]. Diagnostic imaging studies of the SI joint can confirm fracture (traumatic, stress), tumor, infection, osteoarthritis and suggest an inflammatory arthropathy but are often normal in symptomatic patients[8]. Lumbar spine and pelvic imaging is additionally typically useful in ruling out other potential etiologies of patient's symptoms. The gold standard to diagnose SI joint pain is an image guided intra articular injection with positive response to local anaesthetics[9]. Different treatment modalities are in practice now a days to treat sacroiliac joint mediated pain. These treatment modalities range from simple analgesics to local anesthetics with steroid injections, radiofrequency ablation of lateral branch of dorsal rami supplying the SIJ, physiotherapy and to some extent prolotherapy[10]. Local anesthetics combined with steroids are proven to be effective in different studies for mild to moderate pain relief. These SIJ interventions are usually performed under fluoroscope, ultrasound, CT scan or MRI guidance, as per resources available to negotiate the SIJ complex anatomy[11]. While in low resource settings, this procedure is usually performed via land mark technique to administer the drug principally to periarticular space of ligaments and few times with a successful intra articular administration.

The capacity of SI joint has been reported as 0.8-2.5 ml[12]. Hence drug volume exceeding 2.5ml extravasate into periarticular tissues so group-A drug volume was kept within 2.5 ml, whereas periarticular injection bathes the fibrous as well pericapsular space, thus drug volume in GpB was kept at 10ml. As a "gold standard" treatment modality, intra articular sacroiliac joint injection is given under fluoroscopic guidance[12,13]. Lack of dedicated fluoroscope in low resource settings is usually a hindrance to smooth and efficient pain management services. In our center, though dedicated fluoroscope for interventional procedures was available, however at most of the places in Pakistan usually the operation theater fluoroscope is shared for pain procedures. Keeping in view the workload of lower back pain and experience of senior pain consultants towards land mark techniques, this study was planned to assess the effectivity of landmark periarticular technique when compared to fluoroscope guided intra-articular technique for sacroiliac joint pain with the hypothesis that there is no difference of analgesic effectivity between the two techniques.

MATERIAL AND METHODS

After approval of ethical review committee of the Hospital, patient's consent and explaining the risks and benefits to the patients, this prospective randomized control trial was conducted in the department of Pain medicine, Combined Military Hospital Rawalpindi. The duration of the study was one year from July 2015 to June 2016. The sample size was calculated by using WHO sample size calculator. The total sample size of study was 48, since there was no consensus or available data regarding difference between the two techniques, 50% proportion to both the groups were allocated, as 24 in each group.

All the patients with the history of pain in the lower back, buttock, groin and/or lower extremity upto thigh, of more than three months duration with Positive FABER maneuver and tenderness at SIJ, were included in this study.

The patients with history of previous lower back surgery, known allergy to LA/steroids, coagulopathy, infection at site of needle placement or SIJ and patient refusal were excluded from the study. Technique used was non probability consecutive sampling.

Patients were allocated in one of the two groups (group A and group B) by computer generated random number allocation method on daily basis after they were diagnosed with sacroiliac joint pain syndrome. As per study

protocol, all the patients were interviewed, briefed and counseled about the procedure. Before procedure; patient history, clinical examination and investigations were reviewed and vital signs of all the patients were recorded and selected for intervention. The capacity of SI joint has been reported as 0.8-2.5 ml[11]. Hence drug volume exceeding 2.5ml extravaste in to periarticular tissues so group-A drug volume was kept within 2.5 ml, whereas periarticular injection bathes the fibrous as well pericapsular space, thus drug volume in group B was kept at 10ml. Group A received intraarticular SIJ injection of LA and steroids using fluoroscope and group-B received periarticular SIJ injection of LA and steroid using land mark technique. In group-A, the intraarticular injection was performed using fluoroscopy. The patient was placed in the prone position. The fluoroscope was slanted cranially to detect the whole SIJ line and contrast medium (Iohexol) was injected to confirm needle placement in SIJ by the spread of dye. A 90-mm 21 gauge spinal needle was inserted in SIJ for drug administration. Then 2–2.5 ml of a mixture of 1% lidocaine and steroid (Triamcinolone 40mg) was given at one or more sections of the SIJ. In group B the periarticular SIJ injection was performed by using landmark technique. Then 10 ml of a mixture of 1% lidocaine and steroid (Triamcinolone 40mg) was given at the most tender point of SIJ. Pain score was assessed at 0 (preprocedural baseline) and on follow up visits at 4, 8, and 12 week intervals after intervention by using numerical rating scale (NRS). NRS ranges from 0-10 and a score of 0 was taken as no pain, whereas 10 was worst pain imaginable. A score of 0 was taken as no pain, Score 1-3 was considered as minimal pain, 3-6 was considered as moderate pain while 7-10 as severe pain. Computer software statistical package for social sciences (SPSS) version 20.0 was used to manage and analyze the data. Descriptive statistics were used to describe the results i.e. mean and standard deviation (SD) for quantitative variables while frequency and percentages for qualitative variables. Chi square test was used for qualitative variables while an independent sample t-test was used to compare means. A *p*-value <0.05 was considered as significant.

RESULTS

Total 48 patients were included in the study, divided into two groups. Both groups had 24 patients in each group. Mean age in group-A and group-B were 41.20 ± 8.28 and 43.04 ± 9.25 years respectively (*p*=0.46). Weight and gender ratio were also not statistically significant between two groups as shown in table-I. As shown in table-II, there was no difference of pain score at base line 0 week between group A Vs group B reflecting effective randomization. At 4, 8 and 12 week there was stastically significant difference of NRS between group A vs group B. There was a reduction in mean pain score from baseline to 12 weeks in both the groups, group A NRS pain scale was found to be at upper limit of mild intensity at 12 week while group B remained at NRS pain scale of moderate intensity.

Table-I: Patient demographic data.

Patient Parameters	Group A	Group B	*p*-value
Age (Mean ± SD)	41.20 ± 8.28	43.04 ± 9.25	0.46
Weight (Mean ± SD)	60.89 ± 8.40	59.63 ± 9.45	0.62
Gender: Male/Female	14 (58%) : 10 (42%)	15 (62%) : 9 (38%)	0.768

Table-II: Mean numeric rating scale (NRS) pain score.

Week	Group-A (n=24) (NRS)	Group-B (n=24) (NRS)	*p*-value
0	7.5 ± 0.99	7 ± 1.10	0.1
4	4.2 ± 1.2	5.1 ± 1.1	<0.01
8	4.0 ± 0.97	5.25 ± 1.29	<0.001
12	3.1 ± 1.6	5.55 ± 1.0	<0.001

DISCUSSION

SI joint dysfunction constitutes 15-30% among different causes of low back pain[3,12]. In SI joint pain syndrome steroids with local anesthetics are used as a short to midterm pain relief procedure[14]. The principle finding of this study suggests that the use of fluoroscopy improves the outcomes in patients with SI Joint pain syndrome. This finding is consistent with others studies, showing comparable success rates for image guided intra-articular injections[12-14]. The cause of SI joint pain pathology sometimes also lies in periartcular tissues, hence intra-articular or periarticular approaches, both are beneficial. However, data analysis did reveal significant differences in outcomes in both techniques. Different studies found that image guided injections of the SI joint provide prolonged pain relief and ultimately help to increase both mobility and the tolerability of physical therapy. Flouroscopic guided cortico-steroid injections improved sacroiliac pain by approximately 50% to 64%[13-15]. Other studies report good to excellent clinical response in about 50-70% of the patients after SI joint injection guided by CT scan[16]. MRI guided approach has comparable results with CT guided technique[15,16]. CT and flouroscopy are both time consuming interventions that involve the risk of allergy to contrast products and exposure to ionizing radiation for both physicians and patients. In a study of 60 patients Hansen selected patients for blind SI joint injection, only five patients would have received proper joint access that would be necessary for therapeutic SI joint injection, fifteen patients were injected at the most tender point which was within 5cm of the posterior superior iliac spine and none of these injections fell to close approximation to the joint. The remainder of the patients had varied needle placement. This study demonstrates that the placement of needles without fluoroscopy is often inconclusive and drug is administered into periartcular region most of times[9]. Accessing periarticular region for cortcosteroid administration also give satisfactory pain relief though statistically less siginficant than image guided intra articular technique as studied by Sadreddini, with unguided sacroiliac joint approach success rate was 59%[17]. A retrospective review by Borowsky and Fagen conducted in 120 patients found that the combination of intra and peri-articular injection deposition provided superior analgesia than intra-articular injection alone[18]. In our study, there was a significant reduction in NRS pain score from baseline to 12 week in both the groups but intra-articular fluoroscopic guided technique has shown statistically significant better response till 12 week post procedure, so the null hypothesis could not be supported with this study. The author recommends large sample, further multicenter studies to support the evidence.

CONCLUSION

Pain relief score was found to be statistically significant in fluoroscopic guided intra-articular technique as compared to peri-articular landmark technique for sacroiliac joint pain syndrome at 12 week post procedure.

LIMITATION OF THE STUDY

The difference between the two groups being close enough would warrant further study with view to achieve improvement in technique of periarticular injection besides enhancing its expertise among pain care practitioners to address any confounders.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

REFERENCES

1. Hoy D, Brooks P, Blyth F, Buchbinder R. The epidemiology of low back pain. Best Pract Res Clin Rheumatol 2010; 24(6): 769-81.
2. Wynne-Jones G, Cowen J, Jordan JL, Uthman O, Main CJ, Glozier N, et al. Absence from work and return to work in people with back pain: A systematic review and meta-analysis. Occup Environ Med 2014 ; 71(6): 448-56.
3. Cohen SP, Chen Y, Neufeld NJ. Sacroiliac joint pain: A comprehensive review of epidemiology, diagnosis and treatment. Expert Rev Neurother 2013 ; 13(1): 99-116.
4. Visser LH, Woudenberg NP, de Bont J, van Eijs F, Verwer K, Jenniskens H, et al. Treatment of the sacroiliac joint in patients with leg pain: a randomized-controlled trial. Eur Spine J 2013; 22(10): 2310-17.

5. Greis A, Berk J, Gellhorn AC. Non-interventional treatment options for sacroiliac joint mediated pain: A review. OA Musculoskeletal Medicine 2013; 1(1): 10.
6. Laslett M. Evidence-based diagnosis and treatment of the painful sacroiliac joint. J Man Manip Ther 2008; 16(3): 142-52.
7. Stuber K. Specificity, sensitivity, and predictive values of clinical tests of the sacroiliac joint: A systematic review of the literature. J Can Chiropr Assoc 2007; 51(1): 30–41.
8. Wheeler SG, Wipf JE, Staiger TO, Deyo RA, Jarvik JG, Atlas Sj, et al. Evaluation of low back pain in adults. UpTo Date 2016.
9. Hansen HC, McKenzie AM, Cohen SP, Swicegood JR, Colson JD, Manchikanti L. Sacroiliac Joint Interventions: A Systematic Review. Pain Physician 2007; 10(1):165-84.
10. Cox RC, Fortin JD. The anatomy of the lateral branches of the sacral dorsal rami: Implications for radio frequency ablation. Pain Physician 2014; 17(5): 459-64.
11. Artner J, Cakir B, Reichel H, Lattig F. Radiation dose reduction in CT-guided sacroiliac joint injections to levels of pulsed fluoroscopy: A comparative study with technical considerations. J Pain Res 2012; 5: 265–9.
12. Kennedy DJ, Engel A, Kreiner DS Nampiaparampil D, Duszynski B, MacVicar J. Fluoroscopically Guided Diagnostic and Therapeutic Intra-Articular Sacroiliac Joint Injections: A Systematic Review. Pain Med 2015; 16(8): 1500-18
13. Masala S, Fiori R, Bartolucci DA, Mammucari M, Angelopoulos G, Massari F, et al. Diagnostic and Therapeutic Joint Injections. Semin Intervent Radiol 2010; 27(2): 160-71.
14. Scholten PM, Patel SI, Christos PJ, Singh JR. Short-term efficacy of sacroiliac joint corticosteroid injection based on arthrographic contrast patterns. PM&R 2015 30; 7(4): 385-91 .
15. Ansari MA, Subedi K, Panta OB, Suwal S. MRI Pattern of Lumbosacral Degeneration in Tribhuvan University Teaching Hospital, Nepal. J Inst Med 2015; 37(2): 51-55.
16. Sahin O, Harman A, Akgun RC, Tuncay IC. An intraarticular sacroiliac steroid injection under the guidance of computed tomography for relieving sacroiliac joint pain: A clinical outcome study with two years of follow-up. Arch Rheum 2012; 27(3): 165-73.
17. Sadreddini S, Noshad H, Molaeefard M, Ardalan MR, Ghojazadeh M, Shakouri SK. Unguided sacroiliac injection: Effect on refractory buttock pain in patients with spondyloarthropathies. Presse Med 2009; 38(5): 710-6.
18. Borowsky CD, Fagen G. Sources of sacroiliac region pain: insights gained from a study comparing standard intra-articular injection with a technique combining intra- and peri-articular injection. Arch Phys Med Rehabil 2008; 89(11): 2048-56.