

## EFFECTIVENESS OF THERAPEUTIC INTERVENTIONS IN SACROILIAC JOINT DYSFUNCTION: A SYSTEMATIC REVIEW

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### ABSTRACT

**Background:** Sacroiliac Joint Dysfunction is a term often used to describe pain in or around the region of the joint that is presumed to be due to traumatic, infection, Inflammatory, degenerative, metabolic and biomechanical disorders of the joint. The sacroiliac joint has been implicated as the primary source in 10% to 25% of the patient with low back pain. Patients with sacroiliac joint dysfunction and pain go through the various conservative interventions and surgical management option for managing sacroiliac joint pain and dysfunction. In addition, there continue to be significant variations in the application of various interventions as well as a paucity of literature.

**Purpose:** The study is to provide an overview of research studies focused on the various treatment procedures and find out the gap in the literature for the future studies the sacroiliac joint dysfunction.

**Methodology:** Studies in any language were identified by searching through databases like Google Scholar, PubMed, and PEDro. Articles in which some form of treatment methods was used to manage the sacroiliac joint pain and dysfunction were included. The PRISMA guidelines were followed for methodological quality.

**Results:** 112 studies were considered for inclusion. Of these, 97 were excluded and 15 randomized clinical trials were included. The evidence for intra articular steroid injection, exercise therapy and minimally invasive sacroiliac joint fusion was fair; however neurotomy, radiofrequency denervation, intra articular prolotherapy, LASER, mesotherapy, manual and physical therapy were limited.

**Conclusion:** On analyzing the result it was found that there is lack of evidence of any standardized intervention for managing the sacroiliac joint dysfunction. Thus it can be concluded that more concentration should be imposed on other treatment method like soft tissue release and manual therapy for the effective treatment on the condition of sacroiliac joint pain and dysfunction.

**KEY WORDS:** Low back pain, Sacroiliac joint pain, Sacroiliac joint dysfunction.

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## BACKGROUND

Low Back Pain is a significant health problem having a major impact on the quality of life and on health care cost [1]. At the beginning of the twentieth century, the sacroiliac joint (SIJ) was considered the most important source of low back pain [2]. In manual medicine, SIJ dysfunction is a potential cause of low back pain and prevalence rate of SIJ dysfunction is reportedly 13.8% to 47.9% in the general population [3].

The sacroiliac syndrome include: pain in the region of the sacroiliac joint with possible radiation to the groin, medial buttocks, and posterior thigh; reproduction of pain by physical examination techniques that stress the joint and elimination of pain by intra-articular injection of local anesthetic[4] and a diagnosis is also based on three or more positive provocation tests of a group of 6 tests, including- yeoman's test, gaenslen's sign, patrick's test, compression test, resisted hip abduction or a positive posterior pelvic pain provocation test (thigh thrust test) has been reported to have the highest sensitivity and specificity for the diagnosis of SIJ syndrome [2].

Clinical findings include tenderness over the SIJ and aggravation by pain provocation test [7]. The treatment of sacroiliac joint pain is challenging. Various treatment options include like SIJ fusion, lateral branch neurotomy, intra-articular injection of local anesthetic and steroid, radiofrequency denervation, surgical stabilization, physical therapy, manipulation, prolotherapy, laser therapy, mesotherapy and chiropractic [3,4,6 -15]. Thus our aim of the study was to provide the available treatment procedures and to find out the gap in the literature for future studies in the sacroiliac joint dysfunction.

## METHODOLOGY

Search was performed from the databases of Google Scholar, PeDro and PubMed. Articles in any language using the MeSH terms like sacroiliac joint dysfunction and treatment for sacroiliac joint pain/dysfunction. Free full text articles were taken from each database. The search time period was limited from January 2001 to Decem-

ber 2015. Only randomized controlled trials in English language were included if they described any form of treatment on SIJ dysfunction. Pilot studies, case reports, non randomized controlled treatment, clinical studies, studies not related to treatment for SIJ dysfunction, articles scored below two in pedro score and reviews were excluded. The methodological quality of the included studies was performed according to PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis) statement.

## RESULTS AND DISCUSSION

15 Studies were included in this review, we found 1 double blind study; thus this study had a low detection and performance bias, 6 single blind studies; this studies avoid any potential bias. Other 8 studies are clinical and case control studies prone to have a high risk of performance bias or a strong detection bias. For all the studies, the following details were extracted; type of study, design, number of patients, outcome measure, and intervention used and results (Table 1).

**Outcome Measures:** Pain was assessed by visual analog scale (VAS) in 7 studies, Numerical pain rating scale (NPRS) in 6 studies and by thermometer pain rating scale in 1 study. Oswestry disability index (ODI) was assessed in 11 studies. RAND, SF- 36 and EQ - 5D in 3 studies.

**Quality of evidence:** The methodology quality for seven trials was extracted from PEDRO database and other eight trials were evaluated by the authors using Pedro scale. Out of these 15 trials, two studies reported as high quality score (8/10), one study obtained 7/10, four studies scored 6/10, two studies scored 5/10, two studies were 4/10, one study was 3/10 and remaining three scored 2/10 (Table 2).

We categorized the trials into three broad spectrums namely- Surgical, Non-Surgical Management and Physiotherapy management. In surgical management like sacroiliac joint fusion. Non-surgical management like pharmacology, intra-particular steroid injections, phototherapy, radiofrequency denervation, radiofrequency neurotomy, mesotherapy and radiofrequency ablation. In physiotherapy management like manipulations, mobilization,

**Table 1: Randomized Controlled Studies.**

Authors (year)	Random Allo.	Conc. Allo.	Baseline Compar.	Blind Subject	Blind therapist	Blind Assessor	Follow Up	Intention to treat	B/w Group compar.	Points to estimates	Total score
Monticone (2004)	Yes	No	Yes	No	No	No	Yes	No	Yes	Yes	5
Whang et al (2006)	Yes	No	Yes	No	No	No	No	No	Yes	Yes	4*
Cohen et al (2008)	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	7*
Rana k (2009)	Yes	No	Yes	No	No	No	No	No	No	No	2
Kim et al (2010)	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	8*
Dhinkaran et al (2011)	Yes	No	No	No	No	No	No	No	No	Yes	2
Kamali et al (2012)	Yes	No	Yes	No	No	No	Yes	Yes	Yes	Yes	6
Bindra (2013)	Yes	No	No	No	No	No	No	No	Yes	No	2
Visser et al (2013)	Yes	Yes	Yes	No	No	No	No	Yes	Yes	Yes	6
Jee et al (2014)	Yes	No	Yes	Yes	No	No	Yes	No	Yes	Yes	6*
Hyun et al (2014)	Yes	No	Yes	No	No	No	No	No	Yes	No	3
Patel et al (2014)	Yes	No	Yes	Yes	No	No	Yes	No	Yes	Yes	6*
Yoon and Cho (2015)	Yes	No	Yes	No	No	No	No	No	Yes	Yes	4*
Polly et al (2015)	Yes	No	Yes	No	No	No	Yes	No	Yes	Yes	5*
Patel et al (2015)	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	8*

**Table 2: PeDRO score for various randomized controlled studies.**

S.No	Author (year)	Design	Pedro score	No. of patient	Treatment applied	Outcome measure	No. of session	Follow up	Result
1	Monticone et al (2004)	RCT	5/10	42	He-Ne Laser, Mesotherapy, Specific dynamic sacroiliac support and exercises.	VAS and Mens's stability tests and Laslet's pain	10 sessions for He-Ne, 8 sessions twice a week for mesotherapy	12 months	treatment with Mesotherapy, specific sacroiliac belt and exercises shows significant result.
2	Whang et al (2005)	RCT	4/10	148	Intra-articular steroid injection, RF ablation and minimally invasive SI joint fusion using triangular implants.	ODI, VAS, EQ-5D and SF-36	Twice a week for 6 weeks	24 months	Sacroiliac joint fusion using triangular implants across the joint provide six month outcome compared to non-surgical treatment.
3	Cohen et al (2008)	RCT (double-blind)	7/10	28	Radiofrequency denervation and Placebo denervation	NRS, ODI, and GPE	One short study (61 minutes vs 54 minutes)	6 months	Significant result
4	Rana K et al (2009)	RCT	2/10	45	MET, G.D. Maitland mobilization and exercises	TPRS, ODI, ROM	6 session	6 days	MET along with active exercise is moderately significant over maitland.
5	Kim et al (2010)	RCT (triple blind)	8/10	90	Intra-articular prolotherapy and intra-articular steroid injection	VAS and ODI	Biweekly and maximum of three injections	1 month	Intra-articular prolotherapy provided significant result.
6	Dhinkaran et al (2011)	RCT	2/10	30	MET and conventional physiotherapy	ODI and NPRS	6 days	6 days	Along with corrective exercise MET is moderately significance over conventional physiotherapy.
7	Kamallie et al (2012)	RCT	6/10	32	HVLA SM to SI joint and lumbar	VAS, ODI	Immediate, 48th and one month after treatment.	1 month	Single session of SIJ and lumbar manipulation was more effective.
8	Patel et al (2012)	RCT (Single-Blind)	6/10	51	Neurotomy	SF-36BP, ODI, SF-36PF	1 session	9 month	Significant result for Neurotomy
9	Visser et al (2013)	RCT (single-Blind)	6/10	51	Strengthening exercise, manipulation technique, Intra-articular injection	VAS, RAND score	12 weeks	12 week	Manual therapy appeared to be the choice of treatment second choice of treatment to be the intra-articular injections.
10	Bindra S (2013)	RCT	2/10	30	MET, TENS and conventional therapy	ROM, ODI, VAS	6 days	6 days	Significant result MET with conventional therapy.
11	Jee et al (2014)	RCT	6/10	120	Ultrasound and fluoroscopy guided SI joint intra-articular injections	ODI, and VNS	1 session	2 and 12 <sup>th</sup> week	Significant result for both groups.
12	Hyun et al (2014)	RCT	3/10	17	Joint mobilization (MWM- posterior and anterior innominate)	VAS	8 weeks	8 <sup>th</sup> week	MWM group showed a significantly better balance than control group.
13	Yoon and Cho (2015)	RCT	4/10	30	Gait training with shoe ( shoe was made up of polypropylene material)	VAS	1 session	After intervention	Significant result for gait training.
14	Polly et al (2015)	RCT	5/10	148	Sacroiliac joint fusion, intra-articular steroid injections and RFA	VAS, ODI, SF-36 and EQ-5D	Twice a week for 6 weeks	1,3,6 and 12 months and continue to 24 months	Significant result for sacroiliac joint fusion.
15	Patel (2015)	RCT (single-blind)	8/10	51	CRF/LBN	NRS, SF36-BP, ODI, SF36-PF	1 session	1 <sup>st</sup> ,3 <sup>rd</sup> ,6 <sup>th</sup> ,9 <sup>th</sup> and 12 <sup>th</sup>	Significant result for CRF/LBN

(Random alloc.= Random allocation, Conc. Alloc.= Concealed allocation, Baseline Compar. = Baseline Comparability, \*=Pedro score rated by the authors)



mulligan, muscle energy technique, LASER therapy, electrotherapy (TENS and US) and physical exercises were used.

Surgical management was used in 2 studies [4, 12]. Non-surgical management was used in 7 studies [4,8 -12,14] and physiotherapy management was used in 8 studies [3,7,11,14,16 - 19].

This systematic review of therapeutic sacroiliac joint interventions showed good evidence for manipulative therapy [6,13]; intraarticular prolotherapy [9] and lateral branch radiofrequency denervation [10]. Also, fair evidence for sacroiliac joint fusion [4, 12] and radiofrequency ablation [4]. However, the evidence was either lacking or limited (or poor) for all other interventions including periarticular injections, conventional radiofrequency neurotomy [20], pulsed radiofrequency and manual therapy [9, 12].

The principal finding of this review was to document the available treatment approaches on the management of sacroiliac joint dysfunction. Based on the current available data, the systematic review found that most of RCT's trying to propose intra articular injections [4,9,12,14,16] and exercise [4,11,14] in the management of sacroiliac joint dysfunction. We also found that very few studies which emphasize on manual therapy including muscle energy technique [17-19], LASER therapy [11], mulligan [16], mobilization [16,17] and manipulative therapy [7]. All the interventions are tried to manage only pain and quality of life in patients with sacroiliac joint dysfunction and the result demonstrate that none of the intervention are superior to others. So, the most urgent requirement for further research is to establish the effective treatment approaches which resolve all the component of patients with sacroiliac joint dysfunction like pain, depression, gait, psychosocial component and quality of life.

## CONCLUSION

We found that there is lack of literature on the soft tissue releases with respect to pharmacology as well as mobilization with soft tissue releases; deep transverse friction; positional release technique, mulligan; laser therapy and therapeutics modalities like TENS,

Ultrasound (US). Future studies must emphasize on these topics to resolve the widespread musculoskeletal pain sensitivity and psychosocial milieu and to improve quality of life on patients with SIJ pain and dysfunction. The limitations of this systematic review include a paucity of literature on therapeutic interventions and variations in technique.

## ABBREVIATIONS

**VAS** - Visual Analogue Scale,  
**ODI** - Oswestry Disability Index,  
**EQ-5D** - EuroQol-5D,  
**SF-36** - Short Form 36 Health Survey,  
**NRS** - Numerical Rating Scale,  
**GPE** - Global Perceived Effect,  
**NPRS** - Numerical Pain Rating Scale,  
**VNS** - Verbal Numerical Scale,  
**SF36-PF** - Short Form 36- Physical Functioning Score,  
**SF36-BP** - Short Form 36- Bodily Pain Score,  
**TPRS** - Thermometer Pain Rating Scale,  
**RAND** - Rapid Automated Naming Disability

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## REFERENCES

- [1]. Tulder VM, Koes B, Bombardier C. Low back pain. *Best Pract Res Clin Rheumatol*. 2002;16(5):761-775.
- [2]. Weksler N, Velan GJ, Semionor M, Gurvitch B, Klein M, Rozentsueig V and Rudich T. The role of sacroiliac joint dysfunction in the genesis of low back pain: the obvious is not always right. *Arch Orthop Trauma Surg*. 2007;127(10):885-888.
- [3]. Cho BY and Yoon JG. The effect of training with shoe insert on the improvement of pain and gait in sacroiliac joint patients. *J Phys Ther Sci*. 2015;27:2469-2471.
- [4]. Whang P, Cher D, Polly D, Frank C, Lockstadt H, Glaser J, Limoni R, and Sembrano J. Sacroiliac Joint Fusion Using Triangular Titanium Implants vs Non-Surgical Management: Six-Month Outcomes from a prospective Randomized Controlled Trial. *International Journal of Spine Surgery*. 2006; 9(6):1-18.
- [5]. Hadi MA, Pasutharnchat K and Tan KH. Cooled radiology denervation for treatment of sacroiliac joint pain: two-year results from 20 cases. *Journal of Pain Research*. 2013;6:505-511.

- [6]. Kamali F and Shokri E. The effect of two manipulative therapy techniques and their outcome in patient with sacroiliac joint syndrome. *Journal of Bodyworks and Movement Therapies*. 2012;16:29-35.
- [7]. Jee H, Lee JH, Park KD, Ahn J and Park Y. Ultrasound-Guided Versus Fluoroscopy-Guided sacroiliac joint intra-articular injections in the Noninflammatory sacroiliac Joint Dysfunction: A Prospective, randomized, Single-Blinded Study. *Archives of Physical Medicine and Rehabilitation*. 2014;95:330-7.
- [8]. Kim WM, Lee HG, Jeong CW, Kim CM and Yoon MH. A Randomized Controlled Trial of Intra-articular Prolotherapy Versus Steroid Injection for sacroiliac Joint Pain. *The Journal of Alternative and Complementary Medicine*. 2010;16(12):1285-1290.
- [9]. Cohen SP, Hurley RW, Buckenmaier CC, Kurihara C, Morlando B and Dragovich A. Randomized placebo-Controlled study evaluating lateral branch denervation for sacroiliac joint pain. *Anesthesiology*. 2009;109(2):279-288.
- [10]. Monticone M, Moschi A and Negrini S. Symptomatic efficacy of stabilization treatment versus laser therapy for sub-acute low back pain with positive for sacroiliac dysfunction: a randomized clinical controlled trial with 1 year follow-up. *Eur Med Phys*. 2004;40:263-8.
- [11]. Polly DW, Ches DJ, Wine WD, Whang PG, Frank CJ, Harvey CF, Lockstadt, Glaser JA, Limoni RP and Sembrano JN. Randomized controlled trial of minimally invasive sacroiliac fusion using triangular titanium implants vs non surgical for sacroiliac joint dysfunction: 12-Month Outcomes. *Neurosurgery*. 2015;77(5):674-691.
- [12]. Yin W, Willard F, Carreiro J and Dreyess P. Sensory Stimulation-Guided Sacroiliac Joint Radiofrequency Neurotomy: Technique Based on Neuroanatomy of the Dorsal Sacral Plexus. *Spine*. 2003;28(20):2419-242.
- [13]. Visser LH, Woudenberg NP, Verwer K, Jenniskens H and Den Ouden BL. Treatment of the sacroiliac joint in patients with leg pain: a randomized-controlled trial. *Eur Spine J*. 2013;22:2310-2317.
- [14]. Grassi DDO, Souza MZD, Ferrareto SB, Montebelo MIDLM, Guirro ECDO. Immediate and lasting improvements in weight distribution seen in baropodometry following a high-velocity, low-amplitude thrust manipulation of the sacroiliac joint. *Manual Therapy*. 2011;16:495-500.
- [15]. Son JH, Park GD and Park HS. The effect of sacroiliac joint mobilization on pelvic deformation and the static balance ability of female university students with sacroiliac joint dysfunction. *J Phys Ther Sci*. 2014;26:845-848.
- [16]. Kanchan R, Nitesh B and Savita. Comparative analysis on the efficacy of G.D. Maitland's concept of mobilization and muscle energy technique in treating sacroiliac joint dysfunction. *Indian Journal of Physiotherapy and Occupational Therapy*. 2009;3(2):18-21.
- [17]. Bindra S. A study on the Efficacy of Muscle Energy Technique as compared to Conventional Therapy on Lumbar Spine Range of Motion in Chronic Low Back Pain of Sacroiliac Origin. *Indian Journal of Physiotherapy and Occupational Therapy*. 2013; 2(4):336-349.
- [18]. Dhinkaran M and Arora AST. Comparative Analysis of Muscle Energy Technique and Conventional Physiotherapy in Treatment of Sacroiliac Joint Dysfunction. *Indian Journal of Physiotherapy and Occupational Therapy*. 2011;5(4):127-131.
- [19]. Patel N, Gross A, Brown L and Gekht G. A Randomized, Placebo-Controlled Study to Assess the Efficacy of Lateral Branch Neurotomy for Chronic Sacroiliac Joint Pain. *Pain medicine*. 2015;13(3):383-398.
- [20]. Patel N. Twelve month follow up of a Randomized Trial Assessing Cooled Radiofrequency Denervation as a Treatment of Sacroiliac Region Pain. *Pain Practice Journal*. 2014;2(1).

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