



Original Article

The comparison of Muscle Energy Techniques with Core Muscle Strengthening Exercises in subjects with Sacroiliac Joint Dysfunction

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ABSTRACT

SIJ Dysfunction designates pain in and around sacroiliac joint area mostly due to hypermobility (excessive movement) or hypomobility (less movement) between the articulating surfaces ultimately leading to pain and discomfort of SIJ. SIJ Dysfunction is 13-30% prevalent with low back pain. **Objectives:** To compare the effect of Muscle Energy Techniques with Core Muscle Strengthening Exercises on pain and disability in subjects with Sacroiliac Joint Dysfunction. **Methods:** It was a Quasi Experimental study in which purposive sampling was used to collect data from Government hospitals of Faisalabad after meeting inclusion and exclusion criteria. 20 subjects with SIJ Dysfunction were randomly allocated into two groups (Group A and Group B). Group A (n=10) received hot pack and MET exercises for 10 days and group B (n=10) received hot pack and core muscle strengthening exercises for 10 days. Evaluation of pain and functional status was done by Visual Analogue Scale and Modified Oswestry Disability Index respectively. Data was analyzed by SPSS version 16. **Results:** There was no significant difference between the effects of Muscle Energy Technique and Core Muscle Strengthening Exercises on pain and disability in SIJ Dysfunction. Both interventions were equally effective. **Conclusions:** MET and Core Muscle Strengthening exercises both were effective for improving pain and disability in SIJ Dysfunction. MET was also effective in improving range of motion in case of hypo mobile joint.

INTRODUCTION

The term sacroiliac joint dysfunction (SIJ Dysfunction) is often used for pain in and around sacroiliac joint mainly due to faulty biomechanics or biomechanical disorder with no history of major trauma. It is among the most leading causes of pain and discomfort of lower back. Low back pain is a significant health problem all over the world [1]. SIJ Dysfunction designates pain in and around sacroiliac joint area mostly due to hypermobility (excessive movement) or hypomobility (less movement) between the articulating surfaces ultimately leading to pain and discomfort of the joint. Sacroiliac joint connects lumbar spine to pelvis & exhibits very little motion so mostly movement occurs at hip or lumbar spine. The joint has to bear whole weight of upper body in upright position therefore its dysfunction can

cause intense low back & pelvic pain. It can affect people of any occupation and functional level [2]. The prevalence of SIJ dysfunction is 13-30% in patients of low back pain. Low back pain affects 70-85 percent of people at some points in their lives [3]. A cross sectional study conducted in 2020 enrolled 234 participants diagnosed with lumbar disc herniation to evaluate sacroiliac joint dysfunction and it stated that 33.3% of participants had sacroiliac joint dysfunction of which more patients had right side SIJ Dysfunction [4]. SIJ Dysfunction is also a common cause of low back pain in athletes with relatively high prevalence in football, basketball, powerlifting, gymnastic, golf, cross country skiing and rowing players [5]. SIJ Dysfunction can be caused by sudden repetitive heavy lifting or strain, soft

tissue injury, fracture of pelvis, previous lumbar or lumbosacral fusion, pregnancy, spondyloarthropathy, osteoarthritis, scoliosis, leg length discrepancy, rheumatoid arthritis, inflammatory bowel disease and autoimmune disorders [6]. Important risk factors that can cause SIJ dysfunction incorporate a history of lumbar fusion, scoliosis, lumbar spinal stenosis, obesity, leg length asymmetry, continuous athletic activity, pregnancy, seronegative HLA-B27 spondyloarthropathies, or gait abnormalities. Inflammation of the SIJ and neighboring structures because of an environmental cause in vulnerable individuals also included in these etiologies [7]. Sign and symptoms of SIJ dysfunction comprises of low back pain (unilateral below L5), hip, leg and groin pain, increased urinary frequency, tenderness on palpation of posterior superior iliac supine and transient numbness. The pain intensity can vary from subtle and gradual to burning and excruciating [8]. Pain increases during standing up from seated position, standing, walking, lifting objects and felt on same side (unilateral) to SIJ Dysfunction [9]. Gait is also jeopardized in most of the patients having SIJ Dysfunction. This is because of decreased coactivation of gluteus maximus and latissimus dorsi of the opposite side, which collectively provide joint stability during walking [10]. Physical therapy, SIJ steroid injections, radio frequency ablation of the neuronal processes behind the SIJ, and open or minimally invasive SIJ fusion are currently available treatment procedures for SIJ dysfunction [11]. Physical therapy techniques for rehabilitation include High Velocity Thrust Manipulation HVTM, soft tissue stretching, positional release technique, Muscle Energy Techniques MET, core muscle strengthening exercises, mobilization exercises, stabilization exercises, proprioceptive neuromuscular facilitation PNF techniques, counter strain and myofascial release techniques [12]. MET can be defined as a manual therapy technique in which patient performs a muscular contraction in definitely controlled position against a force applied by therapist. It could be said that MET are analogous to Proprioceptive Neuromuscular Facilitation stretching (PNF) but MET is executed for longer duration with low forces as compare to PNF to activate tonic muscle fibers that are related to tonic motor units which need less action potential as compared to phasic muscle fibers. The mechanism of MET includes two concepts or principles [1]. Post isometric relaxation and Reciprocal Inhibition [2,13]. Core muscle strengthening is a main therapy in rehabilitation. It has become a preventive and a performance enhancing regime for different lumbar and musculoskeletal injuries. The Core is characterized by a box with the abdomen making the front part, the prevertebral and gluteal muscles on the backside, diaphragm muscle on the dome or roof, the pelvic

floor and hip girdle muscles in the bottom or floor and hip abductors and rotators on the sides. All of these muscles are connected to the spine and thoracolumbar fascia in some way. The core muscle strengthening exercises for spinal muscles increase their strength and improve their ability to keep spine in neutral position result in biomechanical correction. Bridging, wall squats, knee to chest, prone arm opposite leg raise and back extension are some core muscles strengthening exercises [8].

METHODS

The study design was Quasi Experimental with sample size of twenty. Subjects were selected from government hospitals of Faisalabad including Allied Hospital Faisalabad and District Headquarters Hospital Faisalabad. Data was collected through purposive sampling technique and written consent was taken from the subjects before proceeding to intervention. Subjects were selected on the basis of inclusion and exclusion criteria and allocated in two groups Group A and Group B. Group A (n=10) received Hot pack and Muscle energy techniques and Group B (n=10) received Hot Pack and Core Muscle Strengthening exercises. Inclusion criteria for this study included age limit of 20-40 years, subjects diagnosed by specialist doctor, reproducing pain below L5 vertebral level and posterior superior iliac spine, chronic pain from 3-6 months, a score of more than 20% on modified Oswestry disability index, functional leg length discrepancy and three tests positive out of 5 pain provocation tests. Exclusion criteria comprised of generalized infective or inflammatory connective tissue disorders, neurological deficit with sciatica, severe trauma, pelvic fracture, true leg length discrepancy and pregnancy. Visual Analogue Scale, Modified Oswestry Disability Index, thigh thrust test, compression test, distraction test, sacral thrust and Gaenslen's test were used for data collection.

RESULTS

Table 1 shows the frequency distribution of age of both groups. Frequency distribution of age 10 respondents of Group 1 indicates that most of the participants were belonged to the 20-25 years' age category (40.00%) and followed by the 26-30 years' age category (30.00%). 31-35 years' age category included 20.00% of participants and 10.00% participants were belonged to 36-40 years' age category. The frequency distribution of age of 10 respondents of Group 2 indicates that most of the participants were belonged to the 36- 40 years' age category (50.00%) and followed by the 20-25 years and 26-30 years' age category (20.00% each). 31-35 years' age category included 10.00% of participants. It was observed that participants from all age categories of inclusion criteria were included in both group.

Age		Frequency (%)	Valid percent	Cumulative percentage
Group 1	Valid 20-25years	4(40.0%)	40.0	40.0
	26-30years	3(30.0%)	30.0	70.0
	31-35years	2(20.0%)	20.0	90.0
	36-40years	1(10.0%)	10.0	100.0
	Total	10(100.0%)	100.0	
Group 2	Valid 20-25years	2(20.0%)	20.0	20.0
	26-30years	2(20.0%)	20.0	40.0
	31-35years	1(10.0%)	10.0	50.0
	36-40years	5(50.0%)	50.0	100.0
	Total	10(100.0%)	100.0	

Table 1: Frequency distribution of age

Table 2 shows the effect of Muscle Energy Techniques and Core Muscle Strengthening Exercises on pain in Sacroiliac Joint Dysfunction and Modified Oswestry

There was an insignificant difference of pre-VAS score among both groups(p-value>0.05 but post VAS shows significant improvement in both groups(p-value>0.05)

There was an insignificant difference in the Modified Oswestry disability index among both groups (P-value >0.05). But there was a significant difference in pre and post difference of VAS and Modified Oswestry disability index among both groups(P-value <0.05).

Pre VAS score	Group A	Group B	Total	P-value
Moderate Pain	4(40.0%)	3(30.7%)	7(35.0%)	0.648
Severe Pain	6(60.0%)	7(70.0%)	13(6.0%)	
Post VAS Score				
Mild	6(60.0%)	1(10.0%)	7(35.0%)	0.022*
Moderate	4(40.0%)	10(90.0%)	13(65.0%)	
Pre-Modified Oswestry Disability index				
Moderate	3(30.0%)	6(60.0%)	9(45.0%)	0.08
Severe	4(40.0%)	4(40.0%)	8(40.0%)	
Crippling	3(30.0%)	0(0.0%)	3(15.0%)	
Post-Modified Oswestry Disability index				
Minimal	3(30.0%)	3(30.0%)	6(30.0%)	0.37
Moderate	4(40.0%)	7(70.0%)	11(55.0%)	
Severe	3(30.0%)	0(0.0%)	3(15.0%)	

Table 2: Shows the effect of Muscle Energy Techniques and Core Muscle Strengthening Exercises on pain in Sacroiliac Joint Dysfunction and Modified Oswestry.

Group A= Hot pack and Muscle energy techniques

Group B= Hot Pack and Core Muscle Strengthening exercises
Mann-Whitney U test, P-value<0.05*

	Group B (Core Muscle Strengthening Exercise Group)	10	13.00	130.00		
	Total	20				
	Modified Oswestry Disability Index					
	Group A (Muscle Energy Technique Group)	10	11.55	115.50	0.376	0.436
	Group B (Core Muscle Strengthening exercise group)	10	9.45	94.50		
	Total	20				

Table 3: Mann-Whitney Test for inter-group analysis

DISCUSSION

The aim of current study was to compare the effect of the two techniques named as Muscle energy techniques and Core Muscle Stabilization Exercises on pain and functional status in subjects with Sacroiliac joint dysfunction. SIJ Dysfunction is a condition designated by pain in SIJ region mostly due to faulty biomechanics with no history of major trauma. It is very common cause of low back pain. Low back pain is an important health problem all over the world. Almost people of every age are affected from low back pain except children [1]. The current study excludes SIJ Dysfunction due to trauma or pregnancy. Patients with infective or inflammatory disorders, neurological deficits like sciatica and pelvic fracture were also excluded. The sample size of current study was 20 and not very large because of lack of prevalence and proper diagnosis of SIJ Dysfunction. Many of the studies related to the effect of MET on SIJ Dysfunction and even on other areas of body consisted more than 40 subjects like Sefa Haktan Hatik and colleagues enlisted 45 subjects and compare Muscle Energy Technique with chiropractic manipulation. He concluded that Chiropractic Manipulation was more effective than MET. This study supports our research in the aspect that MET has positive effect on pain and disability in SIJ Dysfunction but Chiropractic Manipulation was more effective than MET. We compare MET with Core Muscle Strengthening Exercises and found no significance difference between the effects of these two interventions [14]. Our study included age group of 20-40 years. Most of the studies included participants of same age group like Abdel Rehman and his colleagues conducted a study on cupping versus Kinesiotaping in sacroiliac joint dysfunction and included subjects of age group 33-55 years [15]. MET proved very effective in improving functional status even when applied on other areas of body. A study conducted in 2016 to see the effect of MET on pain and disability in adhesive capsulitis of shoulder joint. The study showed that MET is more effective in improving functional status as compared to pain in adhesive capsulitis of

shoulder joint. By comparing results with our research it is proved that MET is effective in decreasing functional disability and improving quality of life by providing help in performing ADLs more independently [16]. Another study supported the fact that MET has positive effect on pain and disability in SIJ Dysfunction was conducted by Farwa Asad and colleagues. The study was aimed to see the effect of post isometric relaxation (a Muscle Energy Technique) of gluteus maximus on pain and disability and compared it with stretching of hip flexors in anterior innominate dysfunction, a type of SIJ Dysfunction. When compared to each other post isometric relaxation was more effective in improving pain and functional status [17]. A study to find the comparative effectiveness of MET and Mobilization versus conventional Physical therapy in SIJ Dysfunction was conducted by Mathew and his colleagues. The study stated that both the groups which received MET and Mobilization or conventional physical therapy showed convincing improvements in pain and activities of daily life. When results of both groups were compared it was concluded that MET and Mobilization were more effective as compare to conventional physical therapy. If we compare results of this study with current study it is proved that MET is effective treatment for SIJ Dysfunction [18]. Similarly, A Vaidya and colleagues compared the effect of MET and Mulligan's Mobilization with movement in patients with anterior innominate Sacroiliac joint dysfunction. The study stated that both were effective in improving pain and disability. When compared the result of that study to ours it supported the result of our study that MET was more effective in treatment of SIJ Dysfunction [19]. Another study supported the results of our study in a way that METs are very effective in improving pain and disability due to SIJ Dysfunction in post-partum females[20].

CONCLUSIONS

MET and Core Muscle Strengthening exercises both were effective for improving pain and disability in SIJ Dysfunction. MET was also effective in improving range of motion in case of hypomobile joint. There was no convincing difference between the effects of the two interventions when compared to one another.

Conflicts of Interest

The authors declare no conflict of interest

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