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The efficiency of mobilization technique and stabilization exercise in patients with pelvic girdle pain

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Abstract
Background: One of the most frequent pain-producing factors in patients with LBP is sacroiliac joint dysfunctions (SJD), with a prevalence as high as 65%. Pain in the area of the sacroiliac (SI) joints and pubic symphysis is common after childbirth. Continuous low-back pain (LBP) and pelvic girdle pain (PGP) can affect quality of life, infant rearing, and family economics among women after childbirth. More than 30% of pregnant women experience pregnancy-related LBP/PGP. The pain may lead to depression and difficulties in infant rearing. Weakness of the hip extensors, pelvic floor muscles and transverse abdominal muscles are associated with PGP. Moreover, pelvic instability, asymmetry of the SI joints and ligament relaxation, and insufficient and asymmetrical compression of the SI joints are associated with continuous PGP after delivery.
Objective: The aim of this study was to find out the effects of mobilization combined with stabilization exercises in patients with chronic sacroiliac joint dysfunction.
Methods: In this study, 60 patients who were participated were They were then randomized into 3 groups The group A (Mobilization + Stabilization exercise group) (n = 20); the B group (Mobilization) was assigned SIJ mobilization (n = 20), and the C group (n =20) (Stabilization exercise group) was assigned lumbar exercises.
Physical examination tests, visual analog scale, and SF-36 evaluation and MDQ were performed at the beginning of the study, day 7, and day 14, day 28 after the treatment.
Results: showed that Group A were significantly (p<0.05) lower than Group B and Group C the rate of pain in the post treatment the presence of pain in the sacroiliac region compared to pretreatment values were clearly decreased (p0.05).
Conclusions: It concluded from the study that a combination of Mobilization and stabilization exercise therapy is more efficient than exercise therapy only in patients with Sacroiliac joint dysfunction.

Keywords: Sacroiliac joint, exercise. mobilization, MDQ, stabilization exercise

Introduction
Pelvic girdle pain is a type of lumbar back pain. Pelvic girdle pain represents a group of musculoskeletal pain disorders associated with the sacroiliac joint and the surrounding musculoskeletal and ligamentous structures. Its is still a serious challenge as it has been considered the primary cause of low back pain. Pain is experienced between the posterior iliac crest and the gluteal fold, The pain can radiate into the posterior thigh and can occur in conjunction with pain in the symphysis. The endurance capacity for standing, walking, and sitting is diminished and turning over in bed is difficult and painful.
One of the most frequent pain-producing factors in patients with LBP is sacroiliac joint dysfunctions (SJD), with a prevalence as high as 65% (Cohen *et al*., 2013, Hamidi-Ravari *et al*., 2014). Pain in the area of the sacroiliac (SI) joints and pubic symphysis is common after childbirth. Continuous low-back pain (LBP) and pelvic girdle pain (PGP) can affect quality of life, infant rearing, and family economics among women after childbirth. More than 30% of pregnant women experience pregnancy-related LBP/PGP. The pain may lead to depression and difficulties in infant rearing. Weakness of the hip extensors, pelvic floor muscles and transverse abdominal muscles are associated with PGP. Moreover, pelvic instability, asymmetry of the SI joints and ligament relaxation, and insufficient and asymmetrical compression of the SI joints are associated with continuous PGP after delivery
Sacroiliac Joint dysfunction for arthrokinematic dysfunction in the absence of pathological changes in the joints, including capsules and ligaments. It also attributed muscular pain and muscle spasm to difficulties with normal arthrokinematic mobilization in joint capsules,

which limit joint movement when patients attempted to move joints suffering from the symptoms of joint dysfunction.

Joint mobilization can be performed to achieve a neurophysiological effect to reduce muscle pain and guarding, and a mechanical effect such as stretch or burst of contracted tissues. One study reported increased active exercise by patients as a result of joint mobilization The physiological effects of joint mobilization, which is aimed at increasing the range of joint motion and pain reduction, can be explained by the gate control theory proposed by Melzack and Wall The vicious cycle of muscle pain and spasm can be broken by closing the gate where the pain stimulus is largely transmitted through thin filaments, which have slow stimulus conduction velocity, while proprioceptive neurons of thick filaments are stimulated.

Stabilization exercises can reduce pain and disability in chronic LBP, and is superior to other treatments such as usual care and education, but not to conventional physiotherapy protocols (Byström *et al*., 2013, Cairns *et al*., 2006, Ferreira *et al*., 2006, May and Johnson, 2008) [25, 26, 27, 28]. In addition to the strong consensus on the effects of stabilization exercises in patients with chronic LBP, there is also some evidence for its benefits in patients with Sacroiliac joint dysfunction (Al-subahi *et al*., 2017, Barbosa *et al*., 2013, Ferreira *et al*., 2006, Stuge *et al*., 2004a, Stuge *et al*., 2004b) [18, 28, 27, 30]. Furthermore, Monticone *et al*. concluded that stabilization exercises were more effective than laser therapy for the treatment of SJD (Monticone *et al*., 2004) [31]. Studies that compared stabilization exercises with manual therapy have yielded conflicting results (Byström *et al*., 2013, Childs *et al*., 2004, Neha *et al*., 2016, Rasmussen-Barr *et al*., 2003, Stuge *et al*., 2004a, Stuge *et al*., 2004b) [25, 32, 16, 33, 30].

Despite the need to identify the most effective treatment options, controversy still remains. None of the previous studies used inclusion criteria that targeted patients with SJD. The heterogeneous populations considered in earlier research may mask the true effects of treatments and contribute to the current controversy.

Objectives: The aim of this study was to find out the effects of mobilization combined with stabilization exercises in patients with chronic sacroiliac joint dysfunction

Method: Single-blind, randomized, and controlled study, the interventional thesis study with a 28 days follow-up was conducted at a single center Physiotherapy department at the Janardhan Rai Nagar Rajasthan vidyapeeth University, Udaipur A total of 60 patients were in accordance with the inclusion criteria of the study were included. The inclusion and exclusion criteria: Inclusion criteria:

1. Women within the age range of 18 to 60
2. According to the diagnostic criteria, recommended by the International Association for the Study of Pain (IASP), Patients with SIJ pain, pain in the SIJ region (hips/groins or may spread to lower extremity)
3. Those with a minimum of 3 points over the VAS scores for the sacroiliac pain in the past 1.5 months
4. Using no other nonsteroidal anti-inflammatory drugs during the therapy

Exclusion criteria

1. Dislocation in the lower back and lower extremity, fractures
2. Acute disc hernia and spinal stenosis that may cause pain in the lower back and hips, piriformis syndrome The existence of a known central nervous system or peripheral nervous system disease, the existence of a progressive neurological deficit
3. The existence of a known rheumatologic disease (rheumatoid arthritis, ankylosing spondylitis,and so on
4. Prior major surgery for lower back and lower extremity
5. Pregnancy, lactation
6. The existence of known osteoporosis, metabolic diseases, severe cardiovascular disease, uncontrolled hypertension, severe renal disease
7. The existence of malignancies
8. A VAS score of over 8 (on a scale of 0 – 10

They were then randomized into 3 groups The groupA (Mobilization + Stabilization exercise group) (n = 20); the B group (Mobilization) was assigned SIJ mobilization (n = 20), and the C group (n =20) (Stabilization exercise group).

In the study, patients were evaluated by SIJDS via 4 tests: SIJ motion palpation tests (Gillet test, Vorlauf test), SIJDS-specific provocation tests (compression, Posterior Shear), and SIJDS- specific irritation point positivity test (16-18). Visual analog scale (VAS) was used to evaluate the severity of SIJ pain in the study. In the study, Modified version of the Oswestry disability Questionnaire to assess functional status and its named it the (MDQ) was used to evaluate the functional impairment of patients with SIJDS. In addition, SF-36 was used to assess the quality of life of the patients.. On day one, day 7, and day 14 before and after the treatment and on days 28 after the treatment.

Sacroiliac mobilization was performed using manual treatment method by lying patients on their sides. while the restricted sacroiliac joint remains on the upper side. Then, the physiotherapist hand was positioned on the patient's hip, and the flexion was made on the lumbar spine with the movement from the hip to the upper thigh, and the impulse given by the HVLA technique was applied in the anteroinferior direction to the iliac crest and trochanter major We wanted to show the efficacy of this technique in particular with clinical and examination findings in the study.

Hands-on SIJ and lumbar exercises were taught to patients, followed by the assigning of special SIJ exercises included sacroiliac joint mobilization with piriformis stretch, and lumbar exercises Exercises must be conducted on the floor or ground.

Stabilization exercise is the first phase of core training there is little to no movement of the spine. Stabilization exercises include these: Plank, abdominal curl, prone extension, unilateral SLR, Bird Dog Exercise. Each Exercise must be repeated 10 times every day, with 2 sessions per day. Each movement must take at least 10 seconds, and without hurrying, a 20-second break must be taken in between movements. Patients' breath should not be held. During the exercise, pain should be carefully approached

Result

As a Results of this study A total of 60 women were included in the study, who were later divided into 3 groups: SIJ mobilization + Stabilization exercise group (Group A) (n = 20), SIJ mobilization (Group B) (n = 20), and Stabilization exercise group (Group C) (n = 20).

Table 1: Post treatment comparisons of MDQ

MDQ Mean±SD	Pre T. (0) Mean±SD	Post T. 14 Days Mean±SD	Post T. 28 Days Mean±SD	P Value	Between group differences at visit Mean±SD	P Value
Group A	31	23	21	<0.001	62	0.008
Group B	28	18	14	<0.001	64	
Group C	24	16	12	<0.001	65	

Regarding all 4 tests positive on day 1, there was no significant difference between Group B, Group C, (p>0.05). Most of the 4 tests that Group 1 was positive on the 28DAY were significantly lower than Group B and Group C THAN Group A (p<0.05).

MDQ scores for Group A on the 28 DAYS and were significantly (p<0.05) lower than Group B and Group C (Table 3). A comparison of all 3 groups reveals that the SF-36 physical function score After the treatment was similar in all 2 groups.

Table 2: Post treatment comparisons of SF 36 SCORE

SF-36 Physical function Mean±SD	Pre T. (0) Mean±SD	Post T. 14 DAYS Mean±SD	Post T. 28 DAYS Mean±SD	P Value	Between group differences Mean±SD	P Value
GROUP A	71.65±16.18	68±19.17	81.06±26.32	<0.001	10.50±13.81	0.004
GROUP B	68.56±18.15	59±17.19	74±18.90	<0.001	8.16±9.86	
GROUP C	60.68±15.17	55±16.14	68±22.32	<0.001	12.60±14.64	

The SF-36 physical function score of Group A on the twenty-eighth day were significantly (p<0.05) higher than Group B and Group C. VAS Pain Severity Scale (Resting Pain) A comparison of the 3 groups

All assessments of Group A showed that the resting VAS score was significantly (p<0.05) lower than Group B and Group C

Table 3: Post treatment comparisons of visual analog scale

VAS Mean±SD (min/med/max)	Pre T. (0) Mean±SD	Post T. 14 Days Mean±SD	Post T. 28 Days Mean±SD	P Value	Between Group Differences at Visit Mean±SD	P Value
GROUP A	4.00±3.60	3.86±2.64	1.65±1.90	<0.001	1.70±2.65	0.001
GROUP B	2.25±2.65	3.15±2.80	1.60±1.83	<0.002	2.56±1.89	
GROUP C	3.30 ±2.20	2.18±2.45	1.50±1.62	<0.004	1.80±168	

Discussion

A systematic review by Assendelft *et al*. investigating the effect of manipulation in the treatment of chronic LBP suggests that manipulation therapy is not particularly beneficial than other traditional methods such as exercise therapy. Nejati *et al*. compared exercise therapy, manual therapy, and combination therapy in patients with SIJD and stated that exercise and manual therapy alone reduced pain and disability of the patients, but the combined therapy did not show a significant advantage Significant improvement in pain scores and quality of life was detected in both groups, but the significance of combination therapy was not shown to be superior to the exercise group. Few studies conducted on this subject have shown that the difference in patient selection, duration, and density of the application methods results in different outcomes. Since there are no direct methods for the diagnosis of SIJDS, some tests that are specific to this joint have been defined. According to the second criterion of the International Pain Study Association, SIJDS is diagnosed with pain felt in the SIJ region, which can be provoked by special provocation tests such as Gillet, Derbrolowsky, standing flexion, compression, distraction, FABER, Gaenslen, thigh push, sitting flexion, prone extension, supine to sit, Yeoman, tests, sacral sulcus tenderness, sacral compression, palpation of iliac crest spina iliaca posterior superior, and spina iliaca anterior superior while sitting and standing

It is thought that a rehabilitation program with specific exercises for SIJ and lumbar areas, used in the study, not only decrease pain but also may strengthen the gluteus maximus and latissumus dorsi, and mobilize SIJ, and can contribute to stabilization of muscles in this area and as a result improve walking. MDQ score and pain index were recorded before and after the treatment. The improvements were seen in both groups after the treatment, but no significant differences were observed between 2 groups. Nevertheless, in our study, both groups treated with manual therapy and exercises got better results than the group treated with exercises only. It was thought that the reason why the results of our study are different from this study, may be that we was used a combination of manual therapy and exercises treatment. On the other hand, although the MDQ score changes were smaller in our study, a decrease in pain and disability was found in the combination of stabilization exercise with mobilization group. The reason why the results of our study are different from Kamali's study, may have been the longer duration of therapies used in our study.

The lack of a control group, due to ethical issues, is the limitation of this study.

Conclusions It concluded from the study that a combination of Mobilization and stabilization exercise therapy is more efficient than exercise therapy only in patients with Sacroiliac joint dysfunction.

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