



COMPARATIVE EFFECTIVENESS OF MAITLAND MOBILIZATION AND CORE STRENGTHENING EXERCISES IN INDIVIDUALS WITH SACROILIAC JOINT

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ABSTRACT

Background: Sacroiliac joint dysfunction is a term used to describe the pain of the sacroiliac joint (SIJ). It is usually caused by abnormal motion (i.e. hyper- or hypo-mobile) or mal alignment of the sacroiliac joint. Sacroiliac joint syndrome is a significant source of pain in 15% to 30% of people with mechanical low back pain

Aims and objectives: This study was conducted to find out the effects of Core strengthening exercises with and without Maitland mobilization on pain, functional Disability and quality of life.

Material and methodology: This Quasi Experimental study was conducted over four months at the physiotherapy departments of Allied Hospital and DHQ Hospital in Faisalabad. Forty Eight patients with Sacroiliac Joint Dysfunction, aged 25-60 years were assigned into two groups: Group B (Maitland Mobilization+ Core strengthening +US) and Group A (Core strengthening exercises+ US). Each group received three treatment sessions per week for four weeks. Outcome measures included the SIJ Pain and Disability (M.O.L.B.P.D.Q), Numeric Pain Rating Scale (NPRS) and Quality of life (SF36). Data were collected at baseline and post intervention. Statistical analysis was performed using SPSS version 25, with independent sample t-test and Mann-Whitney for between-group comparisons while paired sample t-test and Wilcoxon signed rank test for within-group differences Purposive sampling technique was used to select a sample of 48 subjects with SIJ dysfunction from the hospitals of Faisalabad.

RESULTS: The Group B showed a significant improvement in NPRS scores from 5.7917 ± 1.02062 to 1.3750 ± 1.27901 ($p < 0.001$), M.O.L.B.P.D.Q scores from 20.2917 ± 5.36072 to 3.7083 ± 3.86151 ($p < 0.01$), and SF36 scores from 47.3850 ± 9.78404 to 82.0663 ± 8.55696 ($p < 0.01$). Group A also showed improvements, with NPRS scores from 5.4583 ± 1.17877 to 4.8333 ± 1.09014 ($p = 0.002$), M.O.L.B.P.D.Q scores from 19.9167 ± 6.03552 to 18.7500 ± 5.56581 ($p = 0.02$), and SF36 cores from 43.2625 ± 6.55203 to 44.7550 ± 5.99777 ($p = 0.028$). Group B demonstrated superior in all outcome variable (all $p < 0.01$).

Data Analysis: Data was analyzed by SPSS 25.

Keywords: Sacroiliac joint dysfunction, Maitland mobilization, Core strengthening, Sacroiliac joint pain, Low back pain

INTRODUCTION:

Sacroiliac joint dysfunction is a term used to describe the pain of the sacroiliac joint (SI joint). It is usually caused by abnormal motion (i.e. hyper- or hypo-mobile) or malalignment of the sacroiliac joint. Sacroiliac joint syndrome is a significant source of pain in 15% to 30% of people with mechanical low back pain. The majority of SI joint pathologies affect the adult patient population. There is a high prevalence of SI joint injury in athletes. 88% of cases of SI joint injury are due to either repetitive micro trauma or acute trauma. Separately 20% of cases are pregnancy-related, while 4% are idiopathic. . An increase in lumbar lordosis, as well as an anterior tilt to the pelvis, can lead to SI joint dysfunction. Patients with underdeveloped musculature can develop postural imbalances, such as a short leg.[1] Individuals with SIJ dysfunction often present with unilateral pain below L5. The pain is often localized distal and medial to the posterior superior iliac spine. It is described as sharp, dull, or shooting and is often misdiagnosed as radicular pain, as it can extend down the posterior thigh to the S1 dermatome SIJ pain is typically worse while standing from a seated position, running, climbing, or lying on the Ipsilateral side of the pain . The most common areas where pain is mentioned are the buttocks (94%), the lower lumbar area (72%), the lower limbs (50%) and the groin (14%) [2] .Anatomically the adult SIJ resembles pinna of ear and C-shaped. Its ventral side is convex. The bigger wing of the joint is in Poster lateral direction whereas the smaller wing is directed posteromedial and caudally[3] . SIJ is balanced by brawny ligaments. Sacrum and ilium are mainly connected by Interosseous ligaments of SIJ. It is the sturdiest ligament of body and limit frontal and caudal movement of the sacrum .Biomechanically, SIJ plane surface and its ligaments shifts twisting moments while it does not provide much balance against shear loads.[4]SIJ stability is provided by Transversus Abdominis, Levator & Coccygeus muscles which helps in limiting shear loads. Balance and mobility of hip and pelvis is controlled by thirty five core muscles. SIJ is bordered by thirty five core muscles that comprise Piriformis, hip flexors glutes and hamstring muscle.[5] Core is muscular corset which is anteriorly bordered by abdominal muscles, gluteal and Paraspinals at rear. Diaphragm acts as the roof of core while pelvic floor and hip girdle muscles act as base. It is muscular carton that provide balance to body and spine. Muscles of lumber spine are vital for mobility and balance in core. In a nutshell it acts as focal point of kinematic chain.[6] It is course of appraising and remedying locomotor ailments by joint mobilization. It is to and fro swinging of joint for gaining proper motion. Triggering of tactile corpuscles in first and 2nd level restricts ache of joint.[7]Five levels of movements are used in this technique. Intensity and tetchiness of ailment decides which level should be used in treatment. All joints oscillate in unique way as it is performed from front to back, rear to anterior, vertical tail mobility, glide from mid or side of joint. It is done in thirty seconds interval. [8]

MATERIAL AND METHODS

This Qausi experimental study was conducted to evaluate the effectiveness of Core strengthening exercises with and without Maitland Mobilization in treating Sacroiliac joint dysfunction. The study was conducted at the physiotherapy departments of Allied Hospital and DHQ Hospital in Faisalabad over a period of four months. Ethical approval was obtained from the institutional review board, and the study adhered to the principles outlined in the Declaration of Helsinki. Informed consent was obtained from all participants after explaining the study's aims, procedures, and potential risks.

Participants included 48 patients diagnosed with sacroiliac joint dysfunction , aged between 25 and 60 years, only female, who met the inclusion criteria of at least 3 positive provocation test (Gaenslen test, Patrick test , compression distraction and thigh trust test) , Dull aching pain in

buttock but can be referred to groin or posterior aspect of thigh ,normal BMI(18.45-24.9) and willingness to participate. Exclusion criteria encompassed hypermobility, pregnant woman, obesity, Lower extremity fracture and surgical procedure, presence of neurological sign, Piriformis syndrome and radiculopathy like sciatica.

Participants were assigned into two groups of 24 each. Group B received Maitland Mobilization combined with Core strengthening, while Group A received Core strengthening exercises only. Treatment sessions were conducted three times a week for 4weeks. The interventions aimed to enhance quality of life, reduce pain, and decrease disability. Data collection involved several standardized tools. The M.O.L.B.P.D.Q was used to assess disability. The Numeric Pain Rating Scale (NPRS) quantified pain intensity, and the SF36 was use to assess quality of life . The intervention protocols were meticulously followed. For Group B, Core Strengthening was administered from level 1-6, in addition to the Maitland Mobilization techniques, which consisted of rhythmic oscillatory movements aimed at mobilizing the joint. Group A received only the Core strengthening exercises.Pre- and post-intervention assessments were conducted to evaluate the effectiveness of the treatments. Data were collected at baseline and after the 4weeks intervention period. The M.O.L.B.P.D.Q, NPRS and SF36 measurements provided quantitative data on disability, pain and quality of life, respectively. Data analysis was performed using SPSS version 25. Descriptive statistics summarized the demographic and baseline characteristics of the participants. The Shapiro-Wilk test was used to assess the data normality. Independent sample t-tests and Mann-Whitney tests compared pre- and post-intervention outcomes between the two groups, while paired sample t-tests and Wilcoxon signed rank test evaluated within-group differences. Statistical significance was set at a p-value of less than 0.05.The study's adherence to rigorous methodological standards.

RESULT:

The study included 48 participants with sacroiliac joint dysfunction, assigned into two groups: Group A (Core strengthening exercises) and Group B (Maitland mobilization along with Core strengthening exercises). Both groups showed significant improvements in pain, quality of life and functional disability after one month of treatment. The demographic age has the mean and standard deviation for both groups was 2.48 ± 1.54 . All 48 participants fall within normal BMI range of 18.45-24.9, there was no participant above or below this range.

Table 1: Age Distribution

Age	Frequency	Percent	Cumulate Percent
25-30	17	35.4	35.4
31-36	12	25.0	60.4
37- 42	7	14.6	75.0
43-48	6	12.5	87.5
49-54	3	6.3	93.8
55-60	3	6.3	100.0
Total	48	100.0	

The outcome measures, including pain, quality of life and functional disability, showed significant improvements post intervention in both groups but highly significant result in group B.

Table2. NPRS, M.O.L.B.P.Q, SF36 Scores pre- and post-intervention

Outcome measures	Group A pre	Group A post	Group B pre	Group B post	p-value (post)
NPRS	5.45±1.17	4.83±1.09	5.79±1.02	1.37±1.27	<0.01
M.O.L.B.P.Q	19.91±6.03	18.75±5.56	20.29±5.36	3.70±3.86	<0.001
SF36	43.26±6.55	5.99±44.12	47.38±9.78	82.11±8.55	<0.001

Variables	Statistic	Sig.
Pre value of NPRS	.892	.000
Pre M.O.L.B.P.Q	.955	.064
PreSF36	.944	.024

Shapiro-Wilk tests confirmed the normal distribution of data for M.O.L.B.P.Q and non-normal distribution of data for NPRS and SF36. Independent sample t-tests were used for between-group comparisons, revealing significant differences in post-intervention scores for M.O.L.B.P.Q favoring Group B, Paired sample t-tests indicated significant within-group improvements across all measured outcomes in both groups. MAN WHITNEY and WILCOXIN SIGNED RANK test applied to NPRS and SF36 for between group comparison and within the group improvements respectively. Overall, both interventions effectively reduced pain and improved quality of life and functional capacity in patients with sacroiliac joint dysfunction. However, the combined treatment of Maitland Mobilization with Core strengthening exercises (Group B) demonstrated superior outcomes compared to Core strengthening alone (Group A). These findings suggest that integrating Maitland Mobilization with Core strengthening exercises offer enhanced therapeutic benefits for patients suffering from sacroiliac joint dysfunction.

DISCUSSION

Main intent of immediate research on SIJ Syndrome was to analyze Maitland mobilization. Maitland mobilization regime combines with Core strengthening for group B and core strengthening alone for group A with gradual progression to improve pain, functional ability, and quality of life. Four weeks course of therapy of Maitland and Core reinforcing is given to clients. Exalted holistic recovery and upgrading of ADLs with ache restriction is observed in patients which were given Maitland + Core reinforcing technique in group B. Kaushik guha summarized his RCT study of patients with SIJ dysfunction checking Maitland technique potency. The research comprised a sample size of 30 individuals and found that Maitland mobilization was more efficient than exercises for Abdominal and Multifidus muscle strengthening when treating patients suffering from sacroiliac joint dysfunction [9] In our study 48 subjects were sampled This investigation supports our study's claim that incorporating Maitland mobilization along with core strengthening yields better results in minimizing pain, enhancing functional performance and quality of life. Dr. Shailendra Mehta analyzed balancing exercise with mobilization in 2023 for checking their potency in SIJ syndrome. Population sample of 60 subjects were divided in to three even groups. First 20 subjects were introduced with mobilization and stabilization; second one with mobilization and last one with balancing exercise. Combination of both techniques procreated ameliorated outcome [10]The study supported our research results through the evidence that adding core stability program to mobilization was more efficient in patients suffering from sacroiliac joint dysfunction . Sara Mohamed Samir et al.in 2016 ache and normal motion in subjects of lumbago were analyzed by comparing the potency mulligan and Maitland approach. Both methods were evenly efficient for restricting ache and enhancing normal mobility[11]This study also supports our study.

But we want to apply results on large population that why age category from 25-60 with large sample size and greater treatment duration. Aghalar Javadov et al., in 2021, used three groups of

sixty nine sample size. First one was incorporated with SIJ manipulation and exercise of SIJ, 2ND one with exercise of lumbar exercise and SIJ manipulation. Last one with lumbar exercise group. Fusion of both techniques provided excellent outcomes. Exalted results were produced by amalgamation of mobilization and exercise particular to SIJ [12]Our own research agrees with this, showing that core muscle strengthening exercises along with Maitland mobilization can really help people with sacroiliac joint dysfunction feel a lot better

CONCLUSION

In conclusion, the study provided valuable insights into the management of sacroiliac joint dysfunction, demonstrating that the combination of Core strengthening along with Maitland mobilization is more effective than Core strengthening exercises alone in improving pain, disability and quality of life. These findings suggest that combining both techniques into clinical practice could enhance treatment outcomes for patients with sacroiliac joint dysfunction

Recommendation

Adequate time must be appointed for implementation of intervention involved for developing accurate results. Present research project included only females but if males were also included, outcomes would be different. This study indicates that the short-term effects are observed immediately in the available time of 4 weeks while the intermediate effects are seen after 1.5 months of study and the long-term effects are noticeable after more than three months of study. We recommend monitoring these affects in future studies.

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