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Effects of the Suboccipital Muscle Inhibition Technique on Pain, Functional Disability and Quality of Life in Patients with Sacroiliac Joint Pain: a Randomized Controlled Trial

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SUMMARY

Background. Sacroiliac joint pain is a common source of lower back pain, affecting a large number of the global population. However, Muscle Energy Techniques (METs) have been shown to be effective in managing this condition but there has been limited exploration of the potential additional benefits of combining METs as conventional treatment with other manual therapy techniques (suboccipital muscle Inhibition technique).

Methods. This randomized controlled trial was conducted on thirty-eight patients with sacroiliac joint pain. Non-probability convenient sampling technique was used. The data was collected from patients of Sacro-iliac joint pain by using Numerical pain rating scale for pain, Urdu version of Oswestry Disability Index (ODI) for functional disability and Health Questionnaire EQ-5D 5L for quality of life. Patient were equally divided in to two groups by computer generated random number table. Control Group received conventional therapy including Hot pack, transcutaneous electrical nerve stimulator (TENS), therapeutic ultrasound and general METs autogenic inhibition technique for SIJ while Experimental Group received conventional therapy and Suboccipital muscle inhibition technique. Outcomes were measured at base line and then after 2 weeks of treatment (at the last treatment session no treatment was given after it) and to check long term treatment follow up was taken after 6 weeks of the last treatment session.

Results. Both groups reported significant improvement in all outcome measures from baseline to follow-up. However, the combination of Sub-occipital Inhibition Technique with conventional treatment as experimental group demonstrated superior benefits, with a decrease of 17.58 points in ODI, 6.74 points in Numeric Pain Rating Scale (NPRS), and an increase of 38.00 in EQ5L scores (all $p < 0.001$). The control group showed a reduction of 11.26 points in ODI, a decrease of 5.53 points in NPRS, and an increase of 36.42 in EQ5L scores (all $p < 0.001$). A medium to large effect size was observed for all outcomes. SPSS version 27 was used to analyze the data.

Conclusions. Combination of Sub-occipital Inhibition Technique with conventional treatment produced better clinical and statistical improvement in terms of all parameters, indicating that inclusion of Sub-occipital Inhibition Technique in conventional treatment may provide enhanced therapeutic benefits.

Study registration. The trial was prospectively registered in the WHO-Iranian registry of clinical trials (IRCT20190717044238N8, dated: April 03, 2023) (https://www.irct.ir/).

KEY WORDS

Sacroiliac joint disease; muscle energy techniques; suboccipital muscle inhibition technique; Oswestry Disability Index; Numeric Pain Rating Scale; EuroQol-5D.

BACKGROUND

Sacroiliac joints (SIJs) are the largest axial joints in the body, located on each side of the sacrum and pelvic bones. They provide weight transmission the lower extremities down to the lumbar spine by joining the spine to the pelvis. The lumbar spine is commonly thought to be the source of most low back pain (LBP), although the sacroiliac joint is also a possible source of LBP that is frequently disregarded (1). Multiple factors, such as injury, arthritis, pregnancy, and repetitive motion, can contribute to sacroiliac joint pain. discomfort in the buttocks, thighs, or lower back may be present, as well as discomfort that travels down the legs. Pain in the sacroiliac joint (sacroiliac joint) is a common source of disability and decreased quality of life. Among the primary functions of the SIJ is impact absorption between the upper body and legs (1, 2).

The SIJ is surrounded by several ligaments and the strongest muscles to provide stability against shear forces. The sacrum and ilium have six degrees of freedom with respect to one another. Hypomobility and hypermobility are the leading causes of SIJ discomfort. The ligamentous structures encircling the sacroiliac joint provide the joint with stability, especially in terms of resisting shear forces. There are three ligaments: the anterior sacroiliac ligament, interosseous ligament, and posterior sacroiliac ligament (3). During weight bearing activities, the sacroiliac joint transmits ground reaction forces from the trunk to the lower extremities. It carries 60% of the body's weight and is more susceptible to becoming stiff and hypomobile due to excessive sprinting, leaping, and prolonged standing (4). The complex biomechanical mechanism responsible for the stability of the sacroiliac joint is dependent on the form closure and force closure. Sacroiliac joint's anatomical shape, structure, and configuration achieve by form closure mechanisms. The ligaments, fascia, and muscles surrounding the sacroiliac joint provide stability through force closure mechanisms (5). The predominant symptoms of SIJD have been discomfort and hypo- or hypermobility. Numerous research has looked into various SIJD therapy approaches. Laslett discovered that manual therapy combined with lumbopelvic stabilization is a good method for enhancing general quality of life. Another research found that the groups who used the mulligan taping, mulligan mobilisation, hot moist pack, and muscular energy method (MET) all made considerable progress. Another study revealed that SIJD patients might successfully address their pain, impairment, and pelvic asymmetries using manipulation, exercise, and Kinesiotaping (KT). Exercises to strengthen the gluteus Medius can lessen SIJ discomfort, according to another study. The MET contains techniques for manipulating soft tissues that use regulated isometric and/or isotonic contractions to enhance physiologic function and lessen discomfort. The MET can be described as forces exerted by the patient against the therapist's counter force, which could result in maximum muscle contraction (6-8).

Technique of suboccipital inhibition is, in order to palpate the posterior arch of the atlas, which is located between the external occipital protuberance and the spinous process of the axis vertebra, the therapist sits at the head end of the table with hands beneath the subject's head and pads of his fingertips on the arch. With the middle and ring fingers of both hands, the therapist measures the distance between the occipital condyles and the spinous phase of the C2 vertebra. Then, the therapist rests the base of the skull on his or her hands, with the gap facing the therapist. Once tissue relaxation had been attained for two minutes, the pressure would be maintained at that level. To avoid eye movements from disrupting the suboccipital muscle tone, the patient is instructed to keep his eyes closed throughout the SMI procedure. The metacarpophalangeal joints were flexed at 90 degrees for six days each week for two weeks during the therapy. There will be upward pressure applied (9).

Pramod K. Jagtap and Shubhangi D. Mandale conducted a study on April 2015 in which fifty participants between the ages of 18 and 25 were included. Height, weight, BMI (body mass index), and outcome variables recorded before the start of the treatment session, immediately following the therapy, and at the end of the fifth session were all determined for all 50 individuals. According to the findings, the sub-occipital muscle inhibition approach showed a noticeable improvement in the outcome measures, active knee extension (AKE) and forward flexion distance test (FFD). This demonstrates the effectiveness of sub-occipital muscular inhibition therapy in lengthening hamstring muscles in healthy, normal persons. The hamstring muscle's flexibility can be increased by using the sub-occipital muscular inhibition approach (10).

METHODOS

Aim

To determine the effects of the suboccipital muscle inhibition technique on pain, functional disability, and quality of life in patients with sacroiliac joint pain.

Study Setting

The study data was collected from Nur International University Rehabilitation clinic and Pakistan Society Rehabilitation and Disability physiotherapy clinic, Fatima memorial hospital – Physical therapy clinic.

Procedure

A single-blinded, randomized controlled trial was used in this investigation, which lasted for ten months, from November 2022 to July 2023. In this study, 39 individuals with sacroiliac joint discomfort (7 men and 31 females) between the ages of 18 and 25 were chosen. The five Laslett's criteria - which include the Compression Test, Distraction Test, Thigh Thrust Test, Gaenlsen Test, and Patrick Test - were used to identify the medical condition. If any of these three tests results in positive results, then the condition is classified as sacroiliac joint discomfort according to the criteria out of these five tests. The patients received a piece of paper outlining the possible risks and advantages of the therapy. The Institutional Review Board (IRB) of the Ripha International University in Pakistan officially authorized the study before enrolling patients who met the inclusion criteria and provided written informed permission. A record of the demographic information, including height, weight, and body mass index (BMI), was made. If any of these three tests yields positive results in accordance with the requirements out of these five tests, the condition is classified as sacroiliac discomfort. Prior to therapy, a consent form was filled out. Treatment for the Control Group was completely standard. The experimental group got regular treatment along with the sub occipital inhibition approach. Results were evaluated at the baseline, at the second post-treatment session, at the sixth post-treatment session, and at the eighth post-treatment week. The data was examined using SPSS version 27.

Ethical approval and consent to participate

This study was approved by the Institutional Review Board (REC/RCR &AHS/23/0104 – date of approval: January 02, 2023) of the Riphah International University, Lahore, Pakistan, and is part of the Masters in Orthopedic Manual Therapy Research Project. All the participants provided informed written consent. All methods were performed per the relevant guidelines and regulations.

Assessment

The assessment was carried out at the baseline, the seventh session after two weeks of therapy, and the eighth week after six weeks of treatment. A physical therapist with more than five years of expertise treating patients with musculoskeletal conditions served as the assessor for the evaluations. The patients were assessed by evaluating their pain intensity at rest, level of disability, and quality of life.

Outcome measures

The primary outcomes of this study were pain intensity, the level of functional disability and quality of life.

Numeric pain rating

Numeric pain rating is an abstract degree scale used to access pain. The Numeric Pain Rating Scale (NPRS) scale is the numeric version of visual analogue scale in which subjects select a number that is the interpretation of their pain intensity. For self-completion, it can be given orally or in the form of graph too. The scale ranges from 0 to 10. 0 indicates "no pain" and 10 indicates "worst Pain" (11). The NPRS scale was highly linked with the VAS in the patients who suffering from chronic pain that persist from more than 6 months ranges from 0.86 to 0.95 (12). NPRS declared the good test- retest reliability is r = 0.79-0.96 (ICC= 0.94; 95%CI 0.61-0.96) (13).

Oswestry Disability Index (Urdu version)

Disability was evaluated by Oswestry Disability Index (ODI) for disability Urdu version. The scale is much significant tool used by researchers to find out the functional disability among patients. This scale is considered as gold standard for evaluating LBP outcome status (14). This questionnaire will be used to access disability. It comprises 10 items, 7 related with daily activities, 2 related to pain, 1 related to concentration. Each item scores from 0 to 5. Total score is expressed as values or in the form of percentage with higher scores related to greater disability (15). Using the interpretation of results, 5-14 considered as minor disability, 15 to 24 is modest disability, 25 to 34 labelled as severe disability and 35-50 indicates bed ridden patients with complete disability. ODI declared the good test- retest reliability with ICC range score from 0.72-0.98. Cronbach's alpha shows value of 0.89 that is the true depiction of excellence internal consistency (16).

European Quality of Life 5 Dimensions 5 Level (EQ-5D 5L)

Quality of life was checked by EQ-5D 5L Health Related Quality of Life Question (17). EQ-5D 5L covers the five important domains of health in patients with LBP including self-care, mobility, usual activities, anxiety/depression and pain/discomfort. It is declared as most feasible and recommended for the quick measure of general health status (18). EQ-5D 5L declared the good test- retest reliability with ICC range score from 0.65 and 0.91 (19).

Randomization

Using computer software (https://www.randomizer.org/), subjects are divided into two groups at random. The allocation list was created using the approach of sealed, opaque envelops, labelled 1 for group A and 2 for group B. thirty-nine eligible patients were allocated to Group A treated with baseline treatment which includes a hot pack for

10 minutes, a transcutaneous electrical nerve stimulator (TENS) operating in burst mode at 3 Hz for 10 minutes, therapeutic ultrasound operating at 1 MHz for 5 minutes, and muscle energy techniques (METs) (2 sets, 5 repetitions, 10 second holds), while Group B received suboccipital inhibition technique as the initial treatment. The process of participants' assignment to these groups is represented in the CONSORT flow diagram (**figure 1**).

Intervention

It is requested to patient to avoid any other treatment protocol options like steroids, taping and other manual therapy technique during the study duration.

Experimental Group

Experimental group received conventional treatment and sub occipital inhibition technique Patient was in a comfortable lying down position, with their head and neck properly supported. The therapist identified the suboccipital muscles located at the base of the skull, just below the occipital ridge (the bony prominence at the back of the head). The therapist then uses their fingertips or thumbs to apply gentle, sustained pressure on the suboccipital muscles. The pressure was directed downward and away from the head. The patient was asked to take slow, deep breaths to promote relaxation. The pressure is typically applied for about 4 minutes or until the therapist senses a release of tension in the suboccipital muscles. Throughout the procedure, the therapist paid attention to the patient's response, adjusting the pressure and technique as needed to ensure comfort and safety (6).

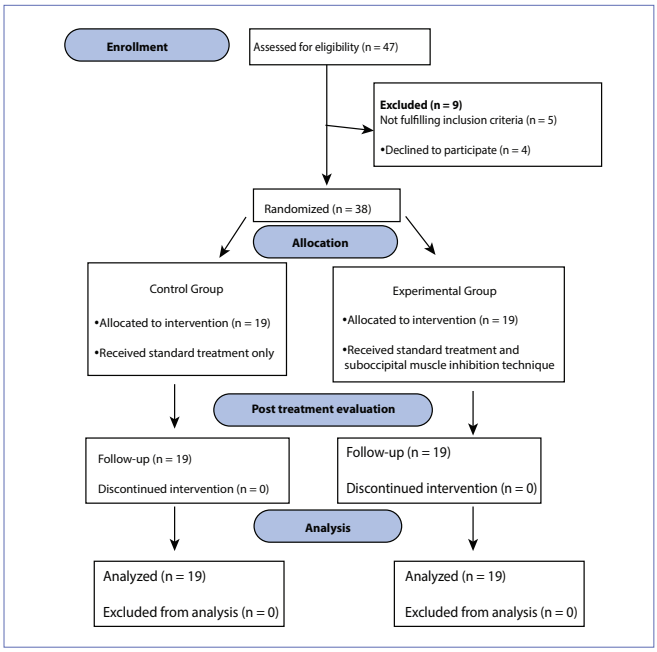

Figure 1. Consort flow diagram.

Control Group

Control group received conventional treatment only (20).

Conventional treatment

Hot pack was applied for 10 minutes, burst mode was selected on transcutaneous electrical nerve stimulator (TENS) with the frequency of 3Hz for time duration of 10 minutes, therapeutic ultrasound set on pulse mode and intensity was 0.08 W/cm^2 for duration of 6 minutes and general METs for SIJ (2 sets, 5 repitions, 10 sec hold) (20).

Sample size

Sample size was calculated through Epitool software by using ODI (20), by sustaining the predicted sample size has a 95% confidence interval and an 80% power of the study. 38 patients (19 in each group) in total.

Data analysis

Version 27 of SPSS for Windows was used to analyse the data. The Statistical significance was set at $p \leq 0.05$.

Descriptive statistics

Pie charts and frequency tables were utilized to display an overview of the group measures taken throughout time. For each variable, the mean and standard deviation were computed. The Shapiro-Wilk test was used to examine the assumptions of normality, and the results showed no obvious violations (p = 0.054-2.00). Analysis of variance (ANOVA) was performed to assess the differences within group after adjusting for pre-test scores in order to determine whether group had the more successful intervention. The 95% confidence interval was kept when the P-value was less than 0.05, indicating that the result was significant. The difference in effect size between the two groups was assessed using Cohen's d. Effect sizes of 0.2, > 0.5, and > 0.8, respectively, were categorized as small, medium, and large.

RESULTS

For the Control Group, the mean age is 21.84 years with a standard deviation of 2.27, the average weight is 58.68 kg with a standard deviation of 3.15, the mean height is 171.11 cm with a standard deviation of 5.85, and the average BMI is 20.07 with a standard deviation of 1.15. On the other hand, the Experimental Group displays slightly different averages. The mean age in this group is 22.11 years with a standard deviation of 2.51, the average weight is 69.26 kg

Table I. Demographic descriptive statistics.

Demographic variables	Control Group (n = 19)	Experimental Group (n = 19)	P-value
	Mean ± SD	Mean ± SD	
Age	21.84 ± 2.27	22.11 ± 2.51	0.73
Weight	58.68 ± 3.15	60.26 ± 4.61	0.22
Height	171.11 ± 5.85	167.16 ± 6.74	0.061
BMI	22.12 ± 4.1	24.78 ± 4.36	0.060
ODI	27.89± 5.35	30.53 ± 3.88	0.090
NPRS	7.37 ± 0.96	7.74 ± 0.81	0.207
EQ-5D 5L	53.26 ± 8.29	57.00 ± 5.63	0.112

ODI: Oswestry disability index; NPRS: numeric pain rating scale; EQ-5D 5L: European Quality of Life 5 Dimensions 5 Level; SD: standard deviation; the results varying numerical values between two groups: Control Group and Experimental Group.

with a larger standard deviation of 9.61, the mean height is a bit lower at 167.16 cm with a standard deviation of 6.74, and the average BMI is noticeably higher at 24.78 with a standard deviation of 3.13. The numbers suggest variations in the demographic and physical characteristics of the two groups, Experimental Group having a higher average weight and BMI, and a slightly lower average height compared to the Control Group (**table I**).

The gender distribution in the Control Group and Experimental Group is predominantly female. In the Control Group, 4 males (21.1% of the total) and 15 females (78.9% of the total), while in the Experimental Group, there are 3 males (15.8% of the total) and 16 females (84.2% of the total). The total number of individuals in each group is 19. Shapiro wilk test was used to assess the normality of data. The data were found to be normally distributed (p = 0.053 to 0.487), therefore, parametric test was applied.

There was a significant decrease in ODI scores from the first to the third measurement. There were significant reductions in NPRS scores from the initial measurement to the following ones, indicating that both treatments were successful in reducing pain over time. Experimental Group had larger mean differences, suggesting potentially more effective pain reduction. EQ5D 5L suggests that the improvement in scores from the second to the third measurement was statistically significant. In both groups, there were significant improvements in EQ5L scores from the initial measurement to the following ones, indicating that both treatments were successful in improving health status over time. Experimental Group showed larger mean differences, suggesting it was potentially more effective (**table II** and **III**).

Table II. Between group analysis for ODI, NPRS and EQ5D 5L.

Follow-ups	Control Group	Experimental Group	Effect Size	Mean difference (95%CI)	P-value
	Mean ± SD	Mean ± SD			
ODI (2nd week)	17.63 ± 3.56	13.89 ± 4.00	0.98	3.74 (1.25-6.23)	0.004*
ODI (8th week)	16.63 ± 4.32	12.95 ± 4.38	0.84	3.68 (.821-6.55)	0.013*
NPRS (2nd week)	4.37 ± 1.30	3.11 ± 1.10	1.04	1.26 (2.06-0.47)	0.003*
NPRS (8th week)	1.84 ± 1.26	1.00 ± 0.94	0.75	0.84 (1.58-0.11)	0.025*
EQ5D 5L (2nd week)	66.89 ± 4.83	78.79 ± 5.37	2.33	11.89 (15.26-8.54)	0.000*
EQ5D 5L (8th week)	89.68 ± 5.78	95.00 ± 4.86	0.99	5.32 (8.84-1.79)	0.004*

ODI: Oswestry disability index; NPRS: numeric pain rating scale; EQ-5D 5L: European Quality of Life 5 Dimensions 5 Level; SD: standard deviation; *P-value less than 0.05; CI: Confidence Interval.

Table III. Within group analysis for ODI, NPRS and EQ5D 5L.

Within Group change		Control Group		Experimental Group	
		Mean difference (95%CI)	P-value	Mean difference (95%CI)	P-value
ODI	Baseline	10.200 (13.49 to 7.05)	< 0.00*1	16.632 (20.49 to 12.77)	< 0.001*
	Post-treatment	11.100 (3.93 to 1.93)	< 0.001*	17.00 (3.59 to 1.69)	< 0.001*
	Follow-up	11.263 (7.33 to 15.19)	< 0.001*	17.579 (14.11 to 21.05)	< 0.001*
NPRS	Baseline	3.000 (3.54 to 2.47)	0.000*	4.632 (3.54 to 2.47)	0.000*
	Post-treatment	2.526 (3.52 to 1.53)	0.000*	2.105 (3.01 to 1.21)	0.000*
	Follow-up	5.526 (4.59 to 6.46)	0.000*	6.737 (5.87 to 7.62)	0.000*
EQ5D 5L	Baseline	13.632 (7.47 to 19.81)	0.000*	21.789 (19.02 to 24.57)	0.000*
	Post-treatment	22.789 (17.38 to 28.21)	0.000*	16.211 (12.89 to 19.54)	0.000*
	Follow-Up	36.421 (42.78 to 30.07)	0.000*	38.000 (40.94 to 35.61)	0.000*

ODI: Oswestry disability index; NPRS: numeric pain rating scale; EQ-5D 5L: European Quality of Life 5 Dimensions 5 Level; *P-value less than 0.05; CI: Confidence Interval.

DISCUSSIONS

The expanding amount of research suggests that a variety of variables interact to affect how sacroiliac joint pain develops and progresses. The physical characteristics of patients, such as age, weight, height, and BMI, as well as gender, are important variables among these. Understanding the therapeutic approaches available for treating the condition's symptoms is essential for providing these individuals with better care and therapy (21).

Muscle Energy Technique (MET) and Sub-occipital Inhibition Technique (SMI) are two such therapeutic techniques that have been widely studied. While MET directly targets the hamstrings, aiming to improve muscle length and flexibility, SMI focuses on the sub-occipital muscles, which are indirectly linked to the sacroiliac joint and the hamstrings through a complex network of fascia and soft tissues. This dual approach could provide more comprehensive care, addressing both the local and systemic factors contributing to sacroiliac joint disease. The combination of suboccipital inhibition technique and METs offers several benefits in managing musculoskeletal problems and enhancing the quality of life (22).

The most significant difference between the groups' physical attributes is observed in BMI. Experimental group has a significantly higher average BMI compared to the Control group (24.78 *vs* 20.07, respectively). Moreover, the standard deviation of BMI in the Experimental group is larger, indicating a broader range of BMI values. The BMI distribution in the Experimental group spread across multiple categories, including the healthy weight range, overweight range, and obesity class I range. In contrast, all individuals in the Control group fall within the healthy weight range. This discrepancy in BMI distribution suggests that the Experimental group may have a higher prevalence of overweight and obesity, which could potentially contribute to the development or progression of sacroiliac joint disease.

Overall, the findings suggest that the Experimental Group and Control group differ in several aspects, including physical attributes, BMI distribution, and gender distribution. These differences may have implications for the aetiology, progression, and management of sacroiliac joint disease. Further research is required to explore the potential relationships between these variables and their impact on the condition, as well as to investigate the effectiveness of the sub-occipital inhibition technique in managing sacroiliac joint disease in patients with varying demographic and physical characteristics.

Hamstring tightness is indeed a common issue experienced by patients with sacroiliac joint disease. It can contribute to pain, discomfort, and limited range of motion in the lower back, pelvis, and legs. As a result, healthcare professionals are contin-

ually searching for more effective treatment methods to address this problem and improve patient outcomes. In this study, therapeutic technique was investigated: Sub-occipital Muscle Inhibition Technique (SMI) with conventional treatment. This technique aims to alleviate hamstring tightness and associated symptoms by targeting the musculature and restoring balance to the sacroiliac joint.

The Sub-occipital Muscle Inhibition Technique (SMI) is a manual therapy approach that focuses on the sub-occipital muscles located at the base of the skull. These muscles are complexly connected to the sacroiliac joint through a complex network of fascia and soft tissues. By applying specific manual pressure or gentle manipulation to these muscles, SMI aims to release tension and restore proper muscle function. The rationale behind this technique is that sub-occipital muscle tightness can create compensatory patterns throughout the body, potentially affecting the function of the hamstring muscles and contributing to sacroiliac joint pain.

On the other hand, the MET as a conventional treatment is a form of osteopathic manipulative treatment that utilizes muscle contractions and stretching to address musculoskeletal imbalances. In the context of sacroiliac joint pain and hamstring tightness, METs involves the active engagement of the patient's hamstring muscles against a counterforce provided by the physiotherapist. This contraction is held for a brief period before being released, and the process is repeated several times. The aim of MET is to reset the neuromuscular system, improve muscle length and flexibility, and restore optimal joint function. Both SMI and conventional treatment (METs) offer potential benefits for patients with sacroiliac joint pain and accompanying hamstring tightness. SMI targets the sub-occipital muscles, which can have far-reaching effects on the entire musculoskeletal system, including the hamstrings. By releasing tension in this area, SMI may help alleviate compensatory patterns and improve overall muscle balance (23).

It is important to note that SMI and MET as therapeutic techniques, their effectiveness and suitability may vary among individuals. Factors such as the severity of sacroiliac joint dysfunction, individual anatomical differences, and underlying causes of hamstring tightness can influence the outcomes of these techniques (24).

Another was study conducted to investigate the impact of self-myofascial release (SMFR) and suboccipital muscle inhibition (SMI) techniques in the suboccipital area on hamstring flexibility. A randomized controlled trial was conducted, involving 60 sedentary individuals with limited hamstring flexibility, divided into three groups: SMI, SMFR, and a control group. Over a 6-week intervention period, the SMI group received gentle pressure techniques targeting the suboccipital muscles to release tension and inhibit muscle activity, while the SMFR group was taught how to perform self-massage using a foam roller in the suboccipital area. The control group didn't receive any specific interventions and continued their regular activities. Before and after the intervention, hamstring flexibility was assessed using standard measurement techniques. The results demonstrated improvements in hamstring flexibility in both the SMI and SMFR groups compared to the control group. Nonetheless, our study has shown that hamstring relaxation also has an influence on sacroiliac joint pain reduction (10). In order to improve patients' levels of disability, reduce their pain, and improve their quality of life, the study examined how well conventional therapy performed on its own and when used in combination with the Sub-occipital Inhibition Technique (SMI) in SIJ pain patients. Both methods of treatment had successful results in these criteria, indicating that patients might get benefit from them. But across all assessed criteria, the Sub-occipital Inhibition Technique combined with conventional therapy produced the best outcomes. This suggests that including the Sub-occipital Inhibition Technique into traditional therapy will provide improved therapeutic outcomes in SIJ disease patients. The results show that SMI has the potential to be an important additional treatment to traditional therapy, providing up opportunities to better patient's outcome and quality of life.

CONCLUSIONS

Both conventional treatment and Sub-occipital Inhibition Technique combined with conventional treatment were effective in improving disability status, reducing pain, and enhancing quality of life in patients. Combination of Sub-occipital Inhibition Technique with conventional treatment however, produced the best outcomes in terms of all parameters, indicating that inclusion of Sub-occipital Inhibition Technique in conventional treatment may provide enhanced therapeutic benefits.

FUNDINGS

None.

DATA AVAILABILITY

Data are available under reasonable request to the corresponding author.

CONTRIBUTIONS

FA: conceptualization, design, writing - original draft, writing - review & editing. AJ: data acquisition, analysis and interpretation, writing - original draft.

CONFLICT OF INTERESTS

The authors declare that they have no conflict of interests.

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