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Effectiveness of combined physiotherapy interventions as a conservative treatment for sacroiliac joint dysfunction pain: a case report

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Abstract: Pain resulting from the sacroiliac joint dysfunction is undetermined and extra articular causes of the dysfunction may be as a result of fractures, ligamentous injuries, and myofascia. Other causes may be as a result of inflammation, unidirectional pelvic shear stress, and repetitive torsional forces, but no specific factor has been identified. Physiotherapy (PT) interventions used in the management of SIJ include repetitive exercises, manual joint mobilization, manipulation, bracing, massage, patient education, aerobic conditioning, exercise therapy and electrotherapeutic modalities although no systematic reviews exist on the effectiveness of combined physiotherapy interventions for the SIJD This case describes the effectiveness of a combined physiotherapy intervention in the conservative management of sacroiliac dysfunction.
The patient was referred from a peripheral hospital with a 15month diagnosis of low back pain with difficulty in standing pain with sitting over time, and intermittent in nature and relieved with pain medications temporarily.
Conclusion
This case report suggests that combined physical therapy interventions relieves pain from sacroiliac dysfunction.

Key words: Sacroiliac dysfunction, Physiotherapy interventions, Low back pain

Introduction

Between 10–25% of chronic low back pain is attributable to the sacroiliac joint.[1] The sacroiliac joint (SIJ) as a source of symptoms has been controversial; however, its role as a pain generator in patients complaining of symptoms that are often attributed to spinal pathology has become better appreciated. Provocative physical examination maneuvers and confirmatory intra-articular injections can help with diagnosing SI joint pain. Pain resulting from the SIJ is undetermined[,3] and extra articular causes of the dysfunction may be as a result of fractures, ligamentous injuries, and myofascia. Inflammation, unidirectional pelvic shear stress, and repetitive torsional forces, can also cause pain but no specific factor has been identified.

Risk factors for SIJ pain may include abnormal gait pattern, limb length discrepancy, scoliosis, , trauma, pregnancy and lumbar fusion surgery with fixation of the sacrum[4] direct trauma or idiopathic onset[,5]. Schwarzer et al.[6]states that, 'Pain from the SIJs has been proven to cause not only low-back pain, but also groin and thigh pain'. The distribution and tenderness of pain, on palpation under the posterior superior iliac spine (PSIS) are reliable signs that the SIJ is the source of pain[7]. Fortin et al [8,9] concluded that common pain patterns include medial buttock pain, groin pain, anterior thigh pain, posterior thigh pain, and pain in the superior lateral thigh.

Physiotherapy (PT) interventions used in the management of SIJ include repetitive exercises, manual joint mobilization, manipulation, bracing, massage, patient

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education, aerobic conditioning, exercise therapy and electrotherapeutic modalities .[10] Different treatment strategies for the SIJD have been reported in literature, with significant improvement in Sacroiliac dysfunction pain. Barbosa et al.[11], reported a pain reduction and functional improvement in patients with SIJD when a combined program of manipulation and isotonic exercise was used. Another study by Castro-Sánchez et al.[12] used Kinesio tape and showed that treatment group was more effective than placebo group in pain reduction but with similar effect in function.

There is no appropriate treatment for this dysfunction, as it is managed as low back pain. However, when accurately diagnosed, the appropriate physical therapy intervention can be implemented for appropriate care.

Case review

A 40 year old apparently physically active male, was referred for physiotherapy with a complaint of low back pain radiating unilaterally to the left lower limb, of 15months duration. Patient reported, current pain episode worsened in November 2019, could not recollect any history of trauma, reported at a private facility where he was diagnosed with lumbar spondylosis, prescribed pain medications and referred for physiotherapy. Pain is usually temporarily relieved by drugs.

Pain is intermittent in nature, aggravated from sit to stand, long hours of sitting, long distance walking and low sitting. Sleep pattern is not interrupted by pain, however activities of daily living such as his job which involves long sitting is affected and also marital life; cannot copulate with spouse due to his pain. He also presented with an antalgic gait and a slight limp.

Physical Exam

On physical assessment, patient walked with an antalgic gait, limping, without any external support. Patient complained of pain in his lower back, into buttock and his left calf. Assessing patient in standing showed no obvious deformities of the spine in either the frontal or sagittal planes. There was mild atrophy of the lower left (lt.) paraspinal muscles of the back. Active spinal movements were measured subjectively, to assess which possible movements may elicit pain. Movements in extension, forward flexion and side flexion, and side rotation elicited pain in the left flank/groin and at the spinal lumbar level of L4-L5 vertebra, buttocks, and left calf muscles. Active extension movement in lying did not elicit any pain, but forward flexion was limited and painful. Mild pain was felt in the buttocks on deep palpation of gluteal muscles. Vertical and transverse digital oscillatory pressures was positive for pain at the fourth and fifth lumbar levels radiating to the groin, lateral side of the hip and left gluteal dimple area. Hip flexion revealed mildly tight hip abductors and hamstrings. Laseque's and Ely's tests were negative. Straight leg test elicited mild pain.

On palpation of the anterior superior iliac spine (ASIS), there appeared to be a slightly lower left ASIS as compared to the right, however with the posterior superior iliac spine (PSIS), showed a higher PSIS as compared to the right. There was no apparent limb length discrepancy. Symmetry tests such as the stork test, supine long sit test and the standing flexion tests were also carried out, showed a change between the left and right PSIS with reduced motion in the left PSIS. [13]using a cluster of pain provocative tests, 2 confirmatory tests reveals a suspicion of the presence of a sacroiliac joint pathology.[14] The cluster tests administered were pelvic distraction, compression,

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Gaenslen's, fabers'test, sacral thrust, and thigh thrust tests.3 of the tests was positive; sacral thrust test, Gaenslen's and Faber's test. The pelvic compression, distraction and thigh thrust tests were negative. The fortin finger test was also positive as patient was able to localize area of pain. There was tightness of the left hip abductors, hamstrings and calf muscles. He perceived his pain scale as 9/10 using the numerical pain rating scale, which rates pain on a scale of 0 to 10. With 10 being the highest level of intensity, pain improvement occurs with a change score of 2.

Oswestry disability score at initial assessment was 48% out of a 100 and with the fear avoidance questionnaire a score of 36 for work subscale and 27 for the physical activity subscale. Clinical outcomes measured were pain, functional disability and spinal movements.

Table 1 Symmetry tests [15]

Test	Technique
Stork test	The patient stands while the examiner palpates the posterior superior iliac spine (PSIS) with one thumb and palpates the base of the sacrum with the other thumb medial to the PSIS. Patient is instructed to stand on one leg while pulling the hip of the palpated side into 90° or more of hip flexion.
Supine long sit test	The patient lies supine. Stabilize pelvis by distracting both legs. Palpate the distal edge of both medial malleoli to assess for any asymmetry in leg length. Have patient sit up with their legs flat and repeat.[16]
Standing flexion test	Patient stands erect, with his feet at shoulder width. The therapist stands or squats behind the patient with thumbs directly under each posterior superior iliac spine (PSIS). Patient bends forward, keeping the knees extended. Each PSIS should move an equal amount in a superior direction.[17] If one PSIS moves further cranial than the other, the test is positive.[17]

Table 2 Sacroiliac pain provocative test (lasetts cluster tests) [18]

Tests	Description (Positive Findings)
Distraction	Patient supine. Examiner applies posterolateral directed pressure to bilateral ASIS. (Reproduction of pain)
Compression	Patient sidelying. Examiner compresses pelvis with pressure applied over the iliac crest directed at the opposite iliac crest. (Reproduction of symptoms)

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Thigh Thrust	Patient supine. Examiner places hip in 90 deg flexion and adduction. Examiner then applies posteriorly directed force through the femur at varying angles of abduction/adduction. (Reproduction of buttock pain)
Sacral Thrust	Patient prone. Examiner delivers an anteriorly directed thrust over the sacrum. (Reproduction of pain)
Gaenslen's	Patient supine with both legs extended. The test leg is passively brought into full knee flexion, while the opposite hip remains in extension. Overpressure is then applied to the flexed extremity. (Reproduction of pain)
Fabers'	Patient in supine. The leg is placed in a figure-4 position (hip flexed and abducted with the lateral ankle resting on the contralateral thigh proximal to the knee. [7] opposite side of the pelvis stabilised at the anterior superior iliac spine, an external rotation, abduction and posterior force is lightly applied to ipsilateral knee until the end range of motion is achieved[7]. A positive test reproduces patient's pain.

Treatment

Treatment in the early weeks of management was to decrease patient's pain primarily and subsequently to correct pelvic asymmetry, correct posture and strengthen any muscle imbalance. To this end, initial means of treatment of treatment was cry therapy, ultrasound, soft tissue massage. Despite the low evidence base in the use of superficial cold and heat therapy, there is however, moderate evidence that there is reduction in pain and disability in a population of low back pain. [19]

Ice therapy, at onset was applied to patient's low back, left sacroiliac joint and groin area for about 15mins, thrice a week, with therapeutic ultrasound (continuous mode) for 15minutes for the first two weeks. The ice therapy was later substituted for heat therapy using the Infrared radiation therapy unit for 15minutes. The soft tissue massage was carried out on the low back, groin, thigh and calf muscles using a non-steroidal anti inflammation cream.

At the end of three weeks, patient could tolerate an exercise program which involved sacroiliac joint mobilization techniques for posterior innominate tilt, sacroiliac joint manipulations, , muscle energy techniques, core stabilization strengthening exercises such as the bridging exercises, lower limb stretches for hamstrings (knee to chest), calf muscles, thrice weekly for a period of 8 weeks. Manipulation also has same therapeutic effects such as stretching of the soft tissues around the joint, improving range of motion, reducing edema and muscle spasm and controlling pain[20]. Barbosa et al [11] used a combination of manipulation and exercise in treatment of SIJ, the results showed an improvement in pain and pelvic position. An exercise program is commonly included for those with SI pain. The rationale for strengthening exercises has included stabilization of the SI joint through dynamic muscle activity [21].

Therapeutic exercise plays such a key role in addressing the underlying dysfunction that lead to the development of

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pain. Monticone et al[22] in a study, found at 12 months, only those treated with therapeutic exercise reported a reduction in pain following treatment. In a randomized control trial involving SIJ pain to assess the short-term benefit of therapeutic exercise as compared with manual therapy and intra-articular SIJ injection, Visser et al[23] found therapeutic exercise alone to be successful in 20% of patients.

Muscle energy techniques are helpful as they require patient activation of muscle groups, and therefore pain tolerance can be more easily monitored. MET aims to normalize soft tissue structures, such as shortened or tight muscles. It can be used to improve joint mobility by influencing the dysfunctional soft tissues, relax tight tense musculature, spasms, or fibrotic changes due to chronic soft tissue problems and help increase muscle strength, increase range of motion (ROM), and decrease edema [24].

Selkow et al[25] suggested that the use of MET focused on contracting hip extensors and hip flexors in the affected lower back region and putting the pelvic bones in the right position. The result of the study by Enas et al[26] showed significant improvement in tilting of the pelvis, pain intensity level and function abilities.

Treatment was reduced to once a week as patient status improved until discharge. At the time of discharge, patient's pain scale was 1.5/10 on the numerical pain rating scale, Oswestry score was 14% while fear avoidance score was 38(17 on the work scale and 21 on the physical activity scale).patient could sustain a trip of about 2hours without discomfort, was also able to resume work and spousal relations with his wife albeit with minimal pain and encouraged to continue an exercise program after discharge, which was already part of the home exercise programe during the period of treatment.

Patient had 23 sessions of physiotherapy. The first 4 weeks, patient was seen thrice weekly, by the end of the fourth week pain score was at 6/10, oswestry disability score was 36% with activities of daily living still severely restricted, FABQ scores was still same. However at the end of week 8, there was an appreciable difference in patient's pain, functional disability and a decrease in his reluctant attitude to return to work and engage in physical activity. He was also able to resume marital relations with his wife and activities of daily living. He had also taken up routine walking daily as an additional exercise program.

A repeat test for the symmetry and pain provocative tests was done, the symmetry tests were negative, four out of the provocative tests were negative, and there was no more pain on the sacroiliac joint, buttocks or calf. Forward flexion was better as patient could touch toes fully, straight leg raise no longer elicited pain.

Discussion

This study was carried out to document the findings from the physiotherapy treatment intervention given to this patient who was referred as a case of lumbar spondylosis, and on physical examination was diagnosed as a case of sacroiliac joint dysfunction with a mild low back pain component. Limited evidence exists to the effectiveness of physiotherapy interventions in treatment due to poorly documented research results in the management of sacroiliac dysfunction using physiotherapy interventions. Evidence based practice cannot be over emphasized, with poorly documented research, proper guidelines in diagnosis and treatment techniques is lacking.

Lasletts, 2008[30], used the cluster tests in diagnosing sacroiliac joint dysfunction. This reduced the difficulties encountered in making an informed diagnosis of sacroiliac

pain. However the lack of studies in physiotherapy interventions, defeats the aim of effective clinical practice and service delivery.

This case study highlights the effectiveness of combined physiotherapy interventions for sacroiliac dysfunction as an empirical evidence in the management of sacroiliac dysfunction as conservative therapy[27] among physiotherapists. Current literature suggests the use of advice, manipulation and mobilization, bracing, and exercise. Manipulation and mobilization[10]Education[28], Postural [13]and lifting[29] advice and modifications should be discussed with all patients. Exercise therapy aimed at stabilizing, strengthening surrounding musculature and addressing functional patterns is well supported by evidence, [8]

The most used physiotherapy interventions are manipulation, mobilization, advice on posture, exercise therapy, mobility exercises, soft tissue massage and a strengthening and stabilization program for the lumbo pelvic complex [30] involve core stabilizers of the spine, and pelvis were used in this study. Ice therapy[19] as a modality for pain reduction was used, despite the paucity of literature justifying the use of superficial heat and cold in managing pain. However, further study on the outcomes of this case report is encouraged using a larger sample size to establish the effectiveness of these interventions

Conclusion

Mobilization, joint manipulation, stabilization and strengthening of the lumbo-pelvic muscles are physiotherapy interventions, effective in managing sacroiliac dysfunction. Further studies to validate effective physiotherapy interventions used in managing sacroiliac dysfunction is encouraged, as this will guide clinical practice while incorporating effective clinical reasoning, reflective thinking and critical clinical appraisals.

Limitation

This was a single case study, hence the interventions used and treatment outcome may not be generalized. It is recommended that a larger case study size be used in future research.

Conflict of Interest

Authors declare no conflict of interest.

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