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Effectiveness of Piriformis and Iliopsoas Stretching with Dry Needling Among Coccydynia Patients

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ABSTRACT:

Background:
Coccydynia is the term used to describe pain in the coccyx, or tailbone. Weight bearing, or sitting, makes the pain worse. Iliopsoas shortening can increase anterior pelvic tilt and lumbar lordosis, both of which can result in excessive pressures on the sacrum and coccyx. Iliopsoas and piriformis stretching can usually improve improper sacral loading and lumbo-pelvic posture. In this way, pressure and discomfort from sitting are reduced.

Objective:
To compare the effectiveness of piriformis and iliopsoas stretching with dry needling on subjects undergoing pain , shortening and tightness of piriformis and iliopsoas muscles among coccydynia patients.

Methodology:

This randomized controlled trial included 100 participants aged 18 years and above, assigned into two groups of 50. Subjects were selected based on inclusion and exclusion criteria and randomly assigned into two groups: **Group A** received dry needling combined with stretching of the Piriformis and Iliopsoas muscles, while **Group B** received conventional physiotherapy along with the same stretching protocol. Interventions were administered over a [insert duration, e.g., 4-week] period. Outcome measures included **Visual Analog Scale** (VAS) for pain, **Oswestry Disability Index** (ODI) for functional disability, and **hip flexion range of motion** (ROM), assessed at baseline and post-intervention. Statistical analysis was performed using paired and independent t-tests, with significance set at $p < 0.05$.

Results:

A total of 100 participants were randomized into two groups of 50 each. Both groups showed significant improvement in pain, range of motion, and function after intervention. However, the group receiving Stretching with Dry Needling showed

significantly greater reductions in pain (VAS), greater improvement in hip range of motion, and better functional outcomes compared to the Conventional Therapy group ($p < 0.001$). No adverse effects were reported.

Conclusion:
Coccyx pain is one the persistent pain due to various causes trauma, childbirth and also due to abnormal coccyx movement.Hence,Both treatment approaches were effective, but stretching combined with dry needling led to significantly greater improvements in pain relief, range of motion, and functional outcomes compared to conventional therapy alone

INTRODUCTION:

Coccydynia is also known as tailbone pain, coccygodynia, coccalgia, or coccygeal neuralgia. The likelihood of acquiring coccydynia is influenced by a person's age, sexual orientation, and body weight [1]. Coccyx discomfort is frequently brought on by direct vertical trauma, recurrent microtrauma, and childbirth. However, more severe underlying causes such infections (including both osteomyelitis and soft tissue abscess) or cancer (particularly chordoma, which has a high mortality rate) must be ruled out [2]. Coccyx pain is three times more common in obese people than in people of normal weight. Obese patients are more prone to undergo posterior subluxation, whereas thin patients are more likely to experience anterior subluxation. Normal-weight persons have a normal or hypermobile coccyx [3]. This illness can affect people of all ages and genders, but adults and teenagers are more vulnerable than young children [4]. This illness affects women five times more often than it affects men, presumably as a result of the increased pressure that develops during pregnancy and childbirth [5]. Function is restricted by the condition's intense pain or heightened pressure sensitivity to sensations, both of which are exceedingly uncomfortable [6]. The first line of conservative treatment for coccydynia may involve relaxation, the use of cold packs, hot baths, laxatives, and avoiding sitting on hard surfaces by using circular (donut) cushions [1,2] along with a number of therapies like massage, manipulation, and stretching [7]. Coccygectomy is recommended for those who do not respond to conservative treatment. Coccygectomy typically provides relief to patients with subluxated or hypermobile coccyx[8].

The preferred method of treatment for coccydynia is still nonsurgical therapy. The coccyx may be subjected to exceptional strains due to postural anomalies brought on by muscle tightness or spasm in any of the muscles. Correcting uneven sacral loading and lumbopelvic posture involves stretching the iliopsoas and piriformis. Results of a prior study showed that stretching the piriformis and iliopsoas muscles as well as Maitland mobilisations increased the amount of time that participants could sit without experiencing pain and the pain threshold[9].

We frequently use dry needling and/or TP injections to speed up recovery in this location because connective tissue problems might be particularly challenging to treat manually.Where necessary, Kuchera's method of releasing the ischiorectal fossa's connective tissues can be used [10]. Dry needling is frequently helpful in releasing restrictive subcutaneous connective tissue that is resistant to treatment [11].

NEED FOR THE STUDY:

Coccydynia is a difficult condition that frequently responds poorly to medicines and injections. Coccydynia typically gets worse while sitting, especially if one is somewhat reclined.Female sex and obesity raise the risk of developing coccydynia since these characteristics may affect posture or the amount of weight that is put on the coccyx.

Some of the early conservative management options for coccydynia include using circular (donut)cushions while sitting, using cold packs, hot baths, laxatives, and avoiding sitting on hard surfaces. Stretching, manipulation, and massage are other treatments. The greatest coccydynia treatments are still nonsurgical. Numerous muscles and ligaments support the coccyx.Any muscular spasm or stiffness can cause postural deviations that put a tremendous amount of tension on the

coccyx. There is proof that piriformis and iliopsoas stretching can assist correct aberrant sacral loading and lumbopelvic posture.The other manual approach, dry needling, which is expected to preserve and improve the patient's activities and quality of life following treatment by relieving resistive subcutaneous connective tissue restrictions, was focused on the subject who had coccydynia as a result of connective tissue limitations.

METHOD

Subjects for this study have been chosen from a private hospital setting in southern India and Participants were selected based on predefined inclusion and exclusion criteria and randomly allocated into two equal groups (n=50). Group A received a combination of Piriformis and Iliopsoas stretching with dry needling, while Group B received stretching with conventional therapy. The interventions were administered over a set treatment duration. Outcome measures—including pain (VAS), range of motion, and functional status—were recorded before and after the intervention to assess the effectiveness of both treatment protocols.

REVIEW OF LITERATURE

Maigne et,al (2001) this study determines the efficacy of intrarectal manipulation combined with levator ani massage compared to SWD for chronic coccydynia using a global index score. At six month follow up they found that 22% of the patients in the manual therapy group versus 12% of patients in the control group experienced a good outcome, i.e. decreased individual global score >50 % at 1 month and >60 % at 6 month 9 [12].

El-Mekawy HS et,al(2006) this study determines the efficacy of ultrasonic therapy in treating postpartum coccydynia following vaginal delivery by Hanan et al. Patients were treated by US on coccygeal region in addition to pelvic floor exercises together with postural correction training 3 times per week for 2 sessions and in control group, only pelvic floor exercises and postural correction training was given. Pain and plasma cortisol level was decreased in both the groups, more pronounced decreased in the study group as compared to control group [13].

Wu CL et,al(2009) this study determines the patient's physiological response before and after manual treatment combined with short wave diathermy for coccydynia. They found significant differences in both numeric pain rating scale (NPRS) and surface temperature obtained by infra-red thermography (IRT) at 12 weeks) [14].

Khatri SM et,al (2011) this study determines the use of intrarectal manipulation combined with phonophoresis and TENS versus phonophoresis and TENS alone and found statistically significant improvement in VAS score and pain free sitting time for patients receiving intrarectal manipulation [15].

Scott KM et,al (2017) this study determines the efficacy of Pelvic floor Physical therapy to treat pain in Chronic coccydynia and Post Coccygectomy [16]

TABLES:

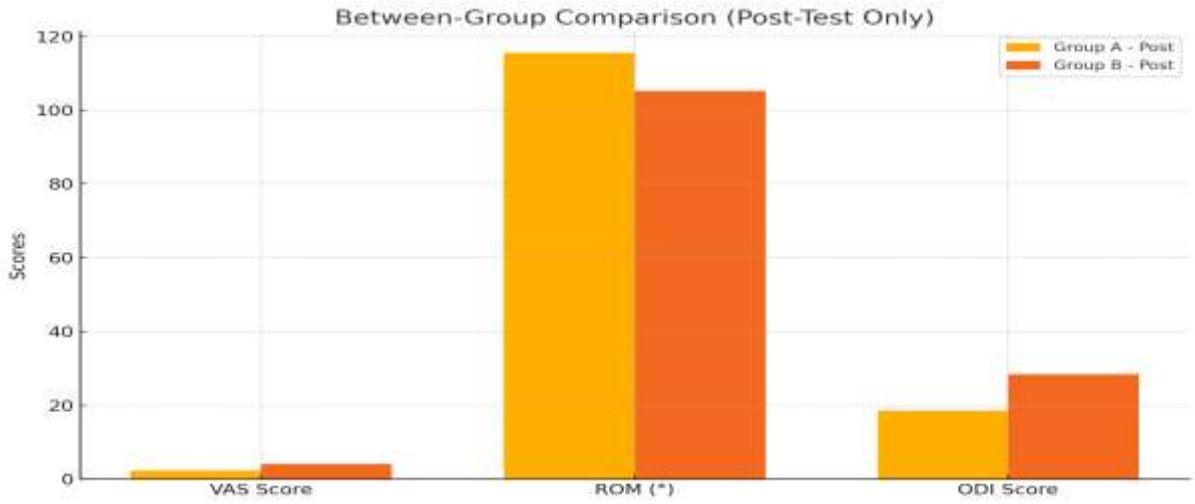
Table 1: Within-Group Comparison (Pre- and Post-Test Values)

Outcome Measure	Group	Pre-Test (Mean ± SD)	Post-Test (Mean ± SD)	p-value
VAS Score	A	7.8 ± 1.2	2.3 ± 1.1	<0.001
	B	7.6 ± 1.3	4.1 ± 1.4	<0.001
Range of Motion (°)	A	95.4 ± 8.2	115.6 ±6.7	<0.001
	B	94.8 ± 9.1	105.2 ± 7.5	<0.001
Functional Score (ODI)	A	48.2 ± 7.5	18.6 ± 6.1	<0.001
	B	47.5 ± 6.9	28.4 ±7.3	<0.001

Table 2: Between-Group Comparison (Post-Test Values Only)

Outcome Measure	Group A (Mean ± SD)	Group B (Mean ± SD)	p-value
VAS Score	2.3 ± 1.1	4.1 ± 1.4	<0.001
Range of Motion (°)	115.6 ± 6.7	105.2 ± 7.5	0.002
Functional Score (ODI)	18.6 ± 6.1	28.4 ± 7.3	<0.001

Graph



Here's the graph comparing the post-test values between the two groups across the same outcome measures.

RESULTS:

A total of 100 participants (mean age 32.6 ± 8.4 years) were enrolled and evenly randomized into two groups: Group A received Piriformis and Iliopsoas stretching combined with dry needling, and Group B received stretching with conventional therapy.

Within-group comparisons revealed significant improvements in both groups after the intervention. Group A showed a reduction in pain as measured by the Visual Analog Scale (VAS) from 7.8 ± 1.2 to 2.3 ± 1.1 ($p < 0.001$), while Group B improved from 7.6 ± 1.3 to 4.1 ± 1.4 ($p < 0.001$). Similarly, hip range of motion in Group A increased from 95.4° ± 8.2° to 115.6° ± 6.7° ($p < 0.001$), and in Group B from 94.8° ± 9.1° to 105.2° ± 7.5° ($p < 0.001$). Functional disability, assessed using the Oswestry Disability Index (ODI), improved significantly in both groups: Group A from 48.2 ± 7.5 to 18.6 ± 6.1 and Group B from 47.5 ± 6.9 to 28.4 ± 7.3 (both $p < 0.001$).

Between-group analysis of post-test values showed that Group A had significantly better outcomes in all measured parameters compared to Group B (VAS: $p < 0.001$, ROM: $p = 0.002$, ODI: $p < 0.001$). No adverse events were reported during the study period.

These findings suggest that adding dry needling to targeted stretching is more effective than conventional therapy alone in improving pain, mobility, and function.

CONCLUSION

The findings of this study indicate that both treatment approaches—stretching with conventional therapy and stretching combined with dry needling—are effective in reducing pain, improving hip range of motion, and enhancing functional ability. However, participants who received Piriformis and Iliopsoas stretching with dry needling showed significantly greater improvements across all outcome measures.

This suggests that incorporating dry needling as an adjunct to targeted stretching provides superior therapeutic benefits compared to conventional therapy alone. Therefore, this combined approach may be considered a more effective intervention in managing musculoskeletal conditions involving the hip and pelvic region.

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