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Effectiveness of Stretching Exercises versus Soft Tissue Mobilisation in PostPartum Females with Coccydynia

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KEYWORDS

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ABSTRACT

Background: Coccydynia is a painful disorder of the coccyx that can have various etiologies and is associated with pain, discomfort at the base of the spine. **Objective:** To determine the effectiveness of stretching exercises and soft tissue mobilisation in postpartum females with coccydynia to reduce pain, improve range of motion, and functional ability. **Methodology:** In this single-blinded controlled trial, data were collected from Ganga Ram Hospital Lahore in 10 months. Patients pre-diagnosed with coccydynia and radiographic imaging, postpartum females after 2-3 months of delivery, office workers, aged between 20 to 35 years, having C-section, were included in the study. Patients having severe post-operative pain, active pelvic or abdominal infections, ovarian cysts, fibroids, obstructive endometrial polyps, or neurological conditions were excluded. Group A was given soft tissue mobilisation and Group B was treated with stretching (23 in each group). Treatment was given twice a week for three weeks, with each session lasting approximately 20 minutes. Outcomes were pain intensity, range of motion, functional ability measured by Numeric Pain Rating Scale, goniometer, and Oswestry Disability Index, respectively. Paired sample t-test was applied for within-group analysis and independent t-test for between-group analysis. **Results:** Mean score of pain rating scale for soft tissue mobilisation exercises group pre-value was 7.11±0.9, post-value was 2.14±1.4. Mean score of Oswestry disability index pre-value was 80.52±10.96 and post-value was 19.09±6.8. Lumbar spine range of motion pre-value was 24.74±7.1 for flexion, 16.78±2.9 for extension, 7.14±1.4 for lateral flexion, 5.48±1.4 for rotation, and post-value was 45.87±6.3 for flexion, 29.91±3.4 for extension, 15.61±2.7 for lateral flexion, 14.35±1.8 for rotation. Mean score of pain rating scale for stretching exercises pre-value was 5.88±1.02 and post-value was 4.52±1.6. Oswestry disability index before was 65.17±9.5 and after was 37.35±8.8. Lumbar spine range of motion of stretching exercises was 28.87±5.4 for flexion, 20.48±4.7 for extension, 8.34±2.2 for lateral flexion, and 2.97±1.3 for rotation were 40.61±6.1, 23.70±4.3, 9.96±2.5, and 9.87±2.02 for flexion, extension, lateral flexion, and rotation ($p \leq 0.005$). **Conclusion:** Both stretching exercises and soft tissue mobilisation groups show effective results; however, soft tissue mobilisation shows greater improvement in pain, functional ability, and lumbar spine range of motion.

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INTRODUCTION

Coccydynia is pain in the coccygeal region. Coccydynia is a disorder associated with pain, discomfort at the base of the spine. It is a painful condition of the coccyx that can have various etiologies. Females are affected five times more than males by the condition. The problem is commonly seen in postpartum females due to prolonged sitting, poor breastfeeding position, or due to internal and external trauma during labour.[1] A study was conducted in France on postpartum women with Coccydynia, have concluded that 3.5% cases of coccydynia in females are related to delivery. Childbirth is a well-known cause of postpartum coccydynia associated with pain and tenderness. Productive and successful interventions that incorporate conservative treatment or surgery are not evident to date.[1]

Diagnosis of coccydynia was made on the basis of detailed history taking and clinical examination. Osteopathic manipulative treatment is the application of manually guided forces to areas of somatic dysfunction to improve physiologic functions. Stretching exercises are present in physical training and muscle rehabilitation programs.[2] Stretching is an essential component of maintaining flexibility, range of motion, and functional ability. Regular stretching exercises can help improve mobility, reduce muscle tension, and alleviate pain. Stretching helps increase flexibility and range of motion by lengthening muscles and tendons. Stretching improves functional ability by allowing for smoother, more efficient movements. Stretching can help reduce pain by releasing tension in muscles and improving joint mobility.[3]

This study aims to determine the effectiveness of stretching and soft tissue mobilisation in coccydynia in the postpartum period to reduce pain, improve range of motion, and functional ability.

METHODOLOGY

In this single-blinded randomised controlled trial, the sample size was determined using a paired t-test with a 95% confidence level, 0.95 power, calculated by G-Power version 3.1.9.7.[4] Sample size was 46, and attrition rate 10% which was 51, by using convenient sampling technique was used. As per permission of the head of department of physiotherapy, data was collected from Ganga Ram Hospital Lahore in 10 10-month duration. Patients diagnosed by an orthopaedic surgeon with the symptoms of coccydynia and radiographic X-ray for confirmation,[5] postpartum females after 2-3 months of delivery,[6] Office workers,[7] aged 20 to 35 years,[8] females having C-section were included in trail.[9] Exclusion patients with history of active pelvic or abdominal infections, severe post-operative pain,[10] ovarian cysts, fibroids, or obstructive endometrial polyps,[11] neurological conditions[12] were excluded.

Group A was given soft tissue mobilisation while Group B was treated with stretching (23 in each group). Patients were enrolled if they fulfilled inclusion criteria after taking informed consent. They had the right to withdraw from the study whenever they wanted. One mediator and one assessor participated in this study. In addition, the assessor was unsure of in which category the subjects were chosen. Pain, range of motion (ROM), and functional ability were evaluated by the examiner before and after treatment. Participants of both groups warmed up with hot packs for 5 minutes. The evaluator, who was blinded to intervention given to each group, measured the functional ability and pain intensity around one minute after this warm-up.

In Group A, the interventions were carried out twice a week for three weeks, with each session lasting approximately 20 minutes. Group A received STM, focusing on mobilising soft tissues to enhance circulation, reduce scar tissue, and improve tissue flexibility.[8] In Group B, the interventions were carried out twice a week for three weeks, with each session lasting approximately 20 minutes. Encourage the patient to breathe deeply and slowly to promote relaxation. The stretching of tight muscles: one set of 10 repetitions, hold for five seconds of each exercise. Then, breathing exercises for one minute. During the entire treatment session, the therapist kept a close eye on patients' discomfort.[4]

SPSS version 36.0 was used for data analysis. Outcomes were pain intensity, range of motion, functional ability measured by Numeric Pain Rating Scale (NPRS), goniometer, and Oswestry Disability Index (ODI), respectively. Paired sample t-test was applied for within-group analysis and independent t-test for between-group analysis. The p-value ≤0.005 was considered significant.

RESULTS

Total number of participants is (46), all are females. All together, these findings suggest a balanced gender distribution of the participants in the sample. Mean age of (25.61±3.61), mean weight of (89.5±15.03), mean height of (5.14±.63), and mean BMI (38.52±9.7). 23 participants in Group A (STM) and 23 participants in Group B (Stretching). Within-group analysis showed mean comparison of NPRS, ODI, and lumbar spine ROM before treatment and after treatment. The pre-treatment value of VAS test was 6.49±1.16, and post-treatment was 3.33±1.9, mean comparison of ODI. The pre-treatment value was 72.8±12.7, and the post-treatment value was 28.2±12.1, mean comparison of lumbar spine ROM. The pre-treatment value was lumbar flexion 26.80±6.6, lumbar extension 18.63±4.3, lumbar lateral flexion 7.74±1.99, and lumbar rotation 4.22±1.8, and post post-treatment value was lumbar flexion 43.24±6.7, lumbar extension 26.80±5.0, lumbar lateral flexion 12.78±3.8and lumbar rotation 12.11±2.9.

Table 1: Independent sample t-test

Follow-ups	Groups	Mean	Std. Deviation	p-value
Pre-NPRS	Group A	7.11	.968	.000
	Group B	5.88	1.02	
Post-NPRS	Group A	2.14	1.40	.000
	Group B	4.52	1.66	
Pre-ODI	Group A	80.52	10.96	.000
	Group B	65.17	9.57	
Post-ODI	Group A	19.09	6.85	.000
	Group B	37.35	8.87	
Pre-Lumbar Flexion	Group A	24.74	7.18	.034
	Group B	28.87	5.49	
Post-Lumbar Flexion	Group A	45.87	6.37	.007
	Group B	40.61	6.13	
Pre-Lumbar Extension	Group A	16.78	2.99	.003
	Group B	20.48	4.73	
Post-Lumbar Extension	Group A	29.91	3.45	.000
	Group B	23.7	4.39	
Pre-Lumbar Lateral Flexion	Group A	7.14	1.49	.011
	Group B	8.72	2.43	
Post-Lumbar Lateral Flexion	Group A	2.43	2.74	.000
	Group B	10.17	2.7	
Pre-Lumbar Rotation	Group A	5.48	1.43	.000
	Group B	2.97	1.32	
Post-Lumbar Rotation	Group A	14.35	1.84	.000
	Group B	9.87	2.02	

Between-group analysis showed mean score of NPRS of Soft Tissue Mobilisation exercises group pre-value was 7.11±0.9, post-value was 2.14±1.4. Mean score of ODI pre-value was 80.52±10.96 and post-value was 19.09±6.8. Lumbar spine ROM pre-value was 24.74±7.1 for flexion, 16.78±2.9 for extension, 7.14±1.4 for lateral flexion, 5.48±1.4 for rotation, and post-value was 45.87±6.3 for flexion, 29.91±3.4 for extension, 15.61±2.7 for lateral flexion, 14.35±1.8 for rotation. Mean score of NPRS of Stretching exercise pre-value was 5.88±1.02 and post-value was 4.52±1.6. ODI

before was 65.17±9.5 and after was 37.35±8.8. lumbar spine range of motion of Stretching exercise group was 28.87±5.4 for flexion, 20.48±4.7 for extension ,8.34±2.2 for lateral flexion, 2.97±1.3 for rotation after was 40.61±6.1 ,23.70±4.3, 9.96±2.5, 9.87±2.02 for flexion, extension , lateral flexion and rotation. P value is less than 0.05, which shows there is a significant difference between the stretching exercises group and STM exercises group, but STM shows greater improvement in pain, functional ability, and lumbar spine range of motion.

DISCUSSION

This research aimed to evaluate and compare the effectiveness of soft tissue mobilisation versus stretching exercises in managing postpartum coccydynia, focusing on their impact on pain reduction, functional disability, and lumbar range of motion. For assessment, the NPRS, ODI, and measurements of lumbar ROM were utilised. Both interventions, STM and stretching exercises, were administered accordingly. The findings revealed statistically significant improvements in post-treatment pain levels, disability scores, and lumbar ROM for both groups. Within-group analysis was conducted using a paired t-test. These outcomes are consistent with findings from a study by Ayesha Basharat et al. (2022), a randomised controlled trial exploring the effects of iliopsoas and piriformis muscle stretching combined with Maitland mobilisation in postpartum coccydynia. Their results showed that the visual analogue scale scores significantly decreased from 6.87±2.07 to 3.9±1.37 post-intervention in the experimental group, while the control group showed only a modest change from 6.87±1.9 to 6.2±1.8.

This supports the notion that stretching, mobilisation, and pharmacologic intervention collectively facilitate substantial pain relief and functional recovery in postpartum coccydynia.[8] Similarly, research by Nabil Mahmoud et al. (2020) focused on a randomised controlled trial investigating the effects of kinesiotaping and an exercise regimen in individuals with obesity-related coccydynia. The study group reported mean pain, MMST, and ODI scores of 33.07±3.8, 6.6±0.7, and 8.7±2.1, respectively, whereas the control group recorded values of 39.9±4.7, 5.8±1.4, and 14.4±2.7. After a four-week follow-up, the experimental group further improved, with scores of 32.2±3.4, 7.13±0.6, and 7.2±1.8, respectively. The control group demonstrated less favourable outcomes, suggesting that kinesiotaping and targeted exercises were effective in alleviating pain and disability while enhancing mobility.[13]

Another relevant study by Shreen R. Abdoelmagd et al. (2025) assessed the effect of combining photobiomodulation therapy with pelvic floor exercises for postpartum coccydynia through a randomised controlled trial. The study utilised outcome measures such as the VAS for pain, the modified Schober test for lumbar flexion ROM, and the ODI for disability. Blinded assessors observed significant improvements ($p<0.001$) across all parameters, with Group A (receiving combined therapy) outperforming the other groups. All participants showed notable improvements from baseline ($p<0.05$), emphasising the added benefit of incorporating photobiomodulation into rehabilitation programs for enhanced pain management.[10]

A retrospective analysis by Mehmat Akif et al. (2024) reviewed patients who underwent a combination of steroid-local anaesthetic injections and rectal manipulation. Their mean VAS score decreased markedly from 7.9 pre-treatment to 2.2 by the 10th day post-intervention ($p<0.001$). This positive effect was sustained, with VAS scores of 2.9 at one-year follow-up and 2.7 at final review. However, individuals with coccygeal hypermobility reported significantly higher pain levels at the final assessment ($p=0.009$). Notably, no significant differences in outcomes were detected between patients with traumatic versus non-traumatic causes.[9]

CONCLUSION

The study comparing the effects of Soft Tissue Mobilisation exercises and Stretching Exercises in patients with coccydynia in the post-partum period on pain and functional disability in patients and lumbar spine mobility shows significant improvements in pain level, range of motion, and functional ability over time for all participants. Both interventions were effective in improving patient outcomes, but Soft Tissue Mobilisation exercises are more effective in improving pain intensity, functional ability, and mobility.

DECLARATIONS

Consent to participate: Written consent had

been obtained from patients. All methods were performed following the relevant guidelines and regulations.

Availability of Data and Materials: Data will be made available upon request. The corresponding author will submit all dataset files.

Competing interests: None

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CONSORT Guidelines: All methods were performed following the relevant guidelines.

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