SHORT COMMUNICATION

Comparing the effects of trunk stabilisation and activation exercises on pain and disability in postpartum lumbo-pelvic pain: A randomised controlled trial

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Abstract

The purpose of this study was to determine and compare the effects of trunk stabilisation and activation exercises on pain and disability in postpartum lumbo-pelvic pain. It was a randomised clinical trial (ClinicalTrials.gov: NCT05490810). Twenty-eight females with lumbo-pelvic pain were randomly allocated to two groups with 14 patients in each group. Group A was treated with trunk stabilisation exercises and Group B was treated with trunk activation exercises, three times a week for eight weeks. Numeric pain rating scale was used to measure the intensity of pain. Disability was assessed through Oswestry disability index (ODI). Both the groups were evaluated before and at the end of the last treatment session. Data was analysed by SPSS 21. There was a significant difference between trunk stabilisation versus activation exercises on pain and disability in postpartum lumbo-pelvic pain with $p<0.05$ in Group A patients. The trunk stabilisation exercises were more effective for the treatment of lumbo-pelvic pain in postpartum females.

Keywords: Lumbosacral region, Pain, Postpartum, Exercises, Disability evaluation.

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Introduction

Recurrent discomfort in the lower back, sacroiliac joints, or a fusion of these regions is referred to as lumbo-pelvic pain in postpartum women.[1,2] Symphysis pubis pain can also radiate along the posterior side of the leg or can be associated with it. About 50% of pregnant women experience lumbar and pelvic pain.[3] After two to three years of delivery, the prevalence varies from 26.5% to 91.0%. After three months of delivery, the majority of women had totally recovered.[4]

Clinically, patient's history such as maternal age, parity, BMI, education, and unfavourable working conditions are all risk factors for severe pain.[5] According to current studies, the development of lumbo-pelvic pain involves the transverse abdominal muscle (TrAM), hip extensor, and pelvic floor muscles (PFM). Furthermore, persistent lumbo-pelvic pain after delivery is indeed a manifestation of pelvic instability, asymmetry, and insufficient sacroiliac joint compression.[6] Trunk stability training is a popular fitness technique that is now being used in therapeutic interventions.[7,8]

Physical therapy approaches confirm improving lumbo-pelvic pain. Trunk stability is important for balance maintenance in the kinetic chain, pelvis, and spine, and is part of a Lumbo-pelvic pain therapy programme.[9-11] Stabilising exercises which include actively manipulating the lumbar segments and pelvic joints are beneficial for patients with lumbo-pelvic pain.[12-14]

The goal of 'trunk stabilisation' exercises is to retrain the gluteal muscles, synchronic activity of the paraspinal and abdominal region, and lowering the risk of injury and suffering. A ratio of active, passive, and neutral control is used to maintain trunk stability. It is essential to comprehend how trunk stabilisation exercises can help individuals with low back pain by strengthening both global and local muscle groups.[15-17]

Postpartum period has a great impact on society as it affects the quality of life. Trunk stability is essential for decreasing the burden on soft tissue structures and avoiding damage and pain. Separate studies have been done on the effect of trunk stabilisation exercises and trunk activation exercises on postpartum lumbo-pelvic pain. But only a limited evidence was available on the comparison of trunk stabilisation and trunk activation exercises. Therefore, the objective of this study was to assess the impact of trunk stabilisation versus activation exercises on pain and disability in postpartum lumbo-pelvic pain.[18-21]

Patients/Methods and Results

A randomised clinical trial was conducted in Jinnah Hospital, Lahore, from January 01, 2022, to July 15, 2022. Sample size was 26 calculated by Epitool by using mean values of Oswestry disability index (ODI) score from a previous study.[1,2] By adding 10% attrition rate, total sample size was reached at 28. For sample, size calculation mean 1 was 33.55; variance 1 was 6.68; mean 2 was 36.77; variance

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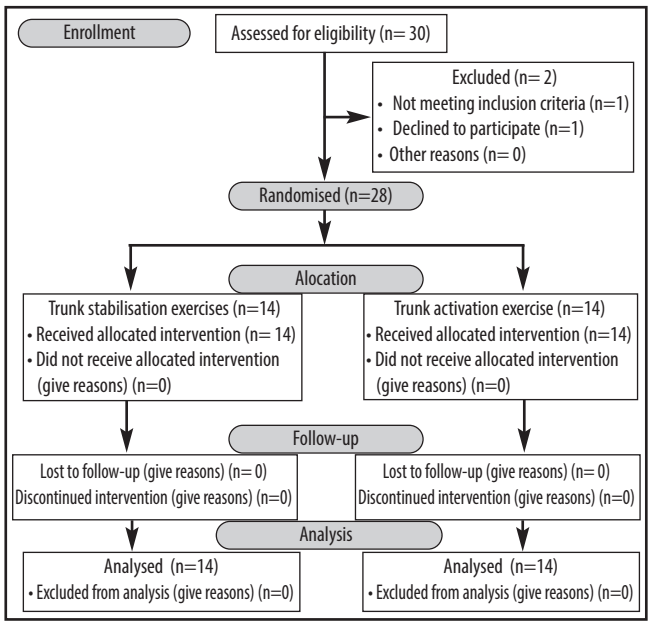

Figure: CONSORT 2010 Flow Diagram

2 was 9.21; confidence level was 0.95; power was 0.8 and ratio of sample sizes (n2/n1) was 1. Inclusion criteria was age between 20-40, female after postpartum (Normal Vaginal Delivery, Caesarian-section), two or more positive posterior provocation test (distraction test, thigh thrust test, compression test), active straight leg raises and women with primigravida and multigravida.[1] Exclusion criteria was orthopaedic or rheumatologic disorders, intervertebral disc pathology, neoplasm or previous surgery of the spine and history of fracture.[1] Nonprobability convenience sampling technique was used to select the study cohort and then they were randomly allocated to groups A and B through lottery method. Trunk stabilisation exercises were given to Group A for three times a week for two weeks and Activation exercises to Group B twice for 5 sessions, with 2-minute interval between them, for three times a week for two weeks. Trunk stabilisation exercises included isometric back exercise, isometric gluteus muscle exercise, pelvic bridging, abdominal bracing, and SLR with-hold at 30 and 45 degrees. Activation exercises included upper and lower rectus abdominis muscle exercise, external and internal oblique muscle exercise, and upper and lower erector spinae muscle exercise. Data collection tool were Visual analogue scale (VAS) and Oswestry disability index. Data was analysed using SPSS 21. Shapiro-wilk test was used to check the normality. To show the progress of the two groups' subjective and objective measurements over time, Paired t-test was used, and between-groups comparison were made using an independent *t*-test. The Riphah College of Rehabilitation and Allied Health Sciences' research and ethics committee gave the study approval with Ref No. REC/RCR & AHS/22/0517. Information was provided to the participants about the study and informed consent was signed.

Table 1 shows the comparison of pre- and post- VAS values in both the groups. For group A, the mean difference between pre- and post-treatment was 3.786±0.579). For group B, the mean difference between pre- and post-treatment was 1.714±0.825. Paired sample t-test was applied. The result showed statistically marked difference (p=0.03). Table 2 shows the comparison of pre- and post-treatment ODI values in both groups. For group A, the mean difference between pre- and post-treatment was 2.214±.426 (p=0.01). For Group B, the mean difference between pre- and post-treatment was 1.500±0.519 (p=0.03). Paired sample t-test was applied. The result shows that there was statistically marked difference. Table 3 shows the comparison of VAS between group A and B, with Pre-treatment 5.93±0.267 and 6.00±0.023 with p=0.327, while the comparison of VAS between group A and B with Post-treatment 2.14±0.663 and 4.29 ±0.825 with p=0.004

Table-1: Comparison of Visual Analogue Scale within Group A and Group B (Paired sample *t*-test).

Groups		Mean±SD	Mean Diff.	*p*-value
Trunk Stabilisation (n=14)	Pre-VAS	5.93±0.267	3.786	0.03
	Post-VAS	2.14±0.663		
Activation Exercises (n=14)	Pre-VAS	6.00±0.023	1.714	0.04
	Post-VAS	4.29±0.825		

SD: Standard Deviation.

Table-2: Comparison of Oswestry Disability Index Questionnaire within Group A and Group B (Paired sample *t*-test).

Groups		Mean±SD	Mean Diff.	*p*-value
Trunk Stabilisation (n=14)	Pre-ODI	3.50±0.519	2.214	0.01
	Post-ODI	1.29±0.469		
Activation Exercises (n=14)	Pre-ODI	3.50±0.519	1.500	0.03
	Post-ODI	2.00±0.555		

SD: Standard Deviation.

Table-3: Comparison of Visual Analogue Scale between Group A and Group B (Independent *t*-test).

		Groups		*p*-value
		Group A(n=14) (Mean±SD)	**Group B**(n=14) (Mean±SD)	
Visual Analogue Scale	Pre-treatment	5.93±0.267	6.00 ±.023	0.327
	Post-treatment	2.14±0.663	4.29±0.825	0.004

SD: Standard Deviation.

Table-4: Comparison of Oswestry Disability Index Questionnaire between Group A and Group B (Independent t test).

		Groups		*p*-value
		Group A(n=14) (Mean±SD)	**Group B**(n=14) (Mean±SD)	
Oswestry Disability Index	Pre-treatment	3.50 ±0.519	3.50 ±0.519	1.000
	Post-treatment	1.29 ±0.469	2.00 ±0.555	0.001

SD: Standard Deviation.

statistically significant because of $p<0.05$. Table 4 shows the comparison of ODI between group A and B. Group A and B with pre-treatment 3.5±0.519) and 3.5±0.519 has p=1.000. The comparison of VAS between Groups A and B with post-treatment 1.29±0.469 and 2.00±0.555 with $p=0.001$ is statistically significant because of $p<0.05$. Thus, alternative hypothesis was accepted.

Conclusion

It is determined that stabilisation exercises and activation exercises both reduce pain and disability after postpartum lumbo-pelvic pain. However, stabilisation exercises are more helpful in reducing disability and pain.

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Author Contribution:

RYC: Conception and design.
HNM: Collection and assembly of data.
SS: Analysis and interpretation of data.
AA: Drafting the manuscript.
AN: Critical revision.
NS: Statistical expertise analysis