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ORIGINAL ARTICLE

COMPARATIVE EFFECT OF CORE MUSCLES STRENGTH TRAINING WITH SUPINE BRIDGING OVER PRONE BRIDGING IN PATIENTS WITH NON SPECIFIC LOW BACK PAIN

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ABSTRACT

Background of the study: Core muscle strength training program is to prevent low back pain, to initiate limb movement for proper utilization of the muscle force and to enhance performance. This study was to compare the effectiveness of core muscles strength training with supine bridging over prone bridging in patients with non specific low back pain. **Methodology:** This was an experimental study of comparative type with 40 subjects. They were equally divided into two groups (20 in each group) by random sampling method. Study was carried out at Physiotherapy department, A.C.S Medical college and hospital, Chennai -77 for duration of 4 weeks. Subjects with the age group between 20 to 35 years with non specific low back pain were included in this study. Group A with Prone bridging exercise received elbow plank and extended plank exercises. Group B with Supine bridging exercise received traditional bridge and alternate single leg bridge exercises. Non specific low back pain and functional disability were outcome measures of the study. VAS and ODI were used as an outcome measurement tools. **Result:** On comparing the mean values of Group A and Group B on Visual Analogue Scale and Oswestry Disability Index Questionnarie Group A with Prone bridging exercise showed a mean difference of 1.95 and 8.85 on VAS and ODI respectively, which is more effective than Group B with supine bridging exercise with mean difference of 1.8 and 7.95 respectively on VAS and ODI with significant difference at P<0.0001. **Conclusion:** This study concluded that prone bridging exercise is more effective in improvement of functional activities and reducing pain than supine bridging exercise program in non specific low back pain.

Keywords: Prone bridging, supine bridging, low back pain, functional disability.

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INTRODUCTION

Non-specific low back pain means, the pain is not due to any specific or underlying disease that can be found. There may be other minor problems in the structures and tissues of the lower back that result in pain. Typically the pain is in one area of the lower back, but sometimes it spreads to one or both buttocks or thighs. The pain is usually eased by lying flat. So, non-specific low back pain is 'mechanical' in the sense that it varies with posture or activity [1,2].

Core strength is the muscular control required around the lumbar spine to maintain function stability. core stability refers to ability to stabilize the spine as a result of muscle activity, with core strength referring to the ability of the musculature to then produce force through contractile forces and intra-abdominal pressure [3,4].

The core stabilization exercises include the so-called quadruped, pelvic tilt, and bridging exercises. The bridging exercise is commonly used for improving lumbo pelvic stabilization. It is a comfortable and typically painless posture for improving the coordination of the core Muscles [5,6].

Stability of the core play roles in the elderly and individuals with disabilities, not only in maintaining an upright body posture, but also in helping to change positions when sitting, standing, and walking. The bridge exercise was widely used in the clinic to train large muscles and local muscles to coordinate in an appropriate ratio.The bridge exercise, increases the muscular strength of the hip joint extensor group and improves trunk stability[7,8].

Aim of the study: The aim of the study was to compare the effectiveness of core muscles strength training with supine bridging over prone bridging in patients with non specific low back pain.

Need for the study: Core muscle strength training program is to prevent low back pain, to initiate limb movement for proper utilization of the muscle force and to enhance performance. There was lack of literature support in normal subjects of core endurance in daily activities.

METHODOLOGY

This was an experimental study of comparative type with 40 subjects. They were equally divided into two groups (20 in each group) by random sampling method. Study was carried out at Physiotherapy department, A.C.S Medical college and hospital, Chennai -77 for duration of 4 weeks. Subjects with the age group between 20 to 35 years with mechanical low back pain were included in this study.

Group A with Prone bridging exercise received elbow plank and extended plank exercises. Group B with Supine bridgingexercise received traditional bridge and alternate single leg bridge exercises. Subjects with spinal and disc pathologies,past history of abdominal surgery,any previous or current experience in core strengthening, any heart disease were excluded from this study. Mechanical low back pain and functional disability were outcome measures of the study. VAS and ODI were used as an outcome measurement tools.

Procedure: Subjects with clinical diagnosis of non specific low back pain were randomly allocated to two groups. Group A prone bridging exercise was received elbow plank and extended plank exercise and Group B supine bridging exercise was received traditional bridge and alternate single leg bridge exercise done with repetition of 6 times in 1st week, 9

times in 2nd week,12 times in third week, 15 times in fourth week, with holding time 10 seconds**.** Pain and functional disability were assisted before and after the intervention session using the measurement tool.

Group A: Prone Bridging Exercise

Received elbow plank and extended plank exercises done with repetition of 6 times in 1st week, 9 times in 2nd week,12 times in third week, 15 times in fourth week, with holding time 10 seconds.

Group B: Supine Bridging Exercise:

Received traditional bridging and alternate single bridging exercises done with repetition of 6 times in 1st week, 9 times in 2nd week,12 times in third week, 15 times in fourth week, with holding time 10 second.

Elbow Plank:

Assume a front support position resting on your fore arm with your shoulders directly over your elbows.Straighten your legs out behind you and lift up your hips to form a dead straight line from your shoulders to your ankles. You should be balanced on your forearms and toes with your abdomen and back working to keep your body straight and hold for 10 second.

Figure 1: Elbow Plank

Extended Plank:

Performing the exercise with the arms further away from the body will progessively increase the difficulty assume a pushup position with hands about 8 in front of your shoulder your body should form a straight line from ankles to shoulder hold for 10 sec.

Figure 2: Extended Plank

Traditional Bridging:

Lie face up on the floor with your knees bend and feet flat on the ground keep your arms at your side with your palms down lift your hips of the ground until your knees hips and shouldrs forms a straight line. Contract your glute muscles and abdomen hold the bridged position for 10 second before easing back down.

Figure 3: Traditional Bridging

Alternate single leg bridge:

Lie on your back with your knees bent and your feet flat on the floor lift your pelvis so that you form a bridge position with a straight line running from your shoulder to your knees.lift your right leg off the floor and extend it so that it continues the straight line. You should be able to feel your left buttock, your back and lower abdomen working to keep the positionhold for 10 seconds then repeat on the other leg.

Figure.4: Alternate single leg bridge

RESULT

Group A: Prone Bridging Exercise

Group A	Number of Pairs	Mean Difference	SD, SEM	Df	T	P value	Significant different (P < 0.05)
VAS Pre –Post	20	1.95	0.394 0.08811	19	22.13	<0.0001	****
ODI Pre –Post	20	8.85	2.996 0.6699	19	13.21	<0.0001	****

Table 1: Paired t test on VAS and ODI within Group A.

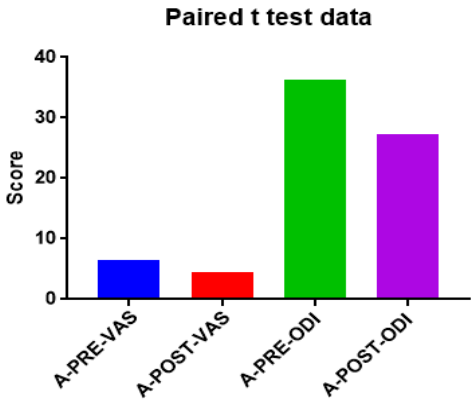
The above table 1 shows significant difference on VAS and ODI within Group Awith P value <0.0001.

Group B: Supine Bridging Exercises

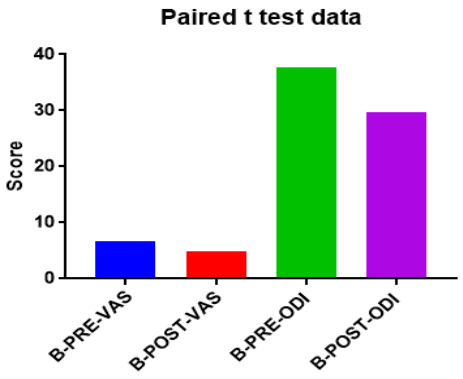
Group B	Number of Pairs	Mean Difference	SD, SEM	Df	T	P value	Significant different (P < 0.05)
VAS Pre –Post	20	1.8	0.4104 0.09177	19	19.62	<0.0001	****
ODI Pre –Post	20	7.95	2.438 0.5452	19	14.58	<0.0001	****

Table 2: Paired t test on VAS and ODI within Group B with Supine Bridging Exercises.

The above table 2 shows significant difference on VAS and ODI within group B with P value <0.0001.



Graph 1: Presentation of VAS and ODI within Group A with Prone Bridging Exercise



Graph: 2 Presentation of VAS and ODI within Group B with Supine Bridging Exercise

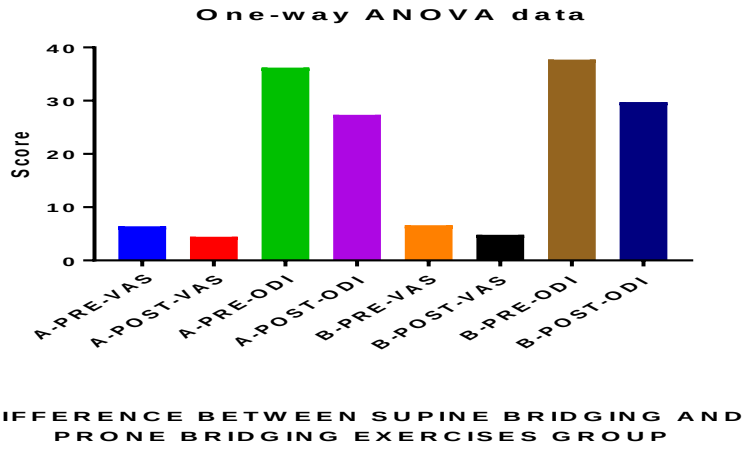
Comparative Study

Exercises	Out come Measures	Mean difference	R Square	F	P value	Sig. diff. (P < 0.05)
GROUP A	**VAS**	1.95	0.9716	743.3	<0.0001	****
	ODI	8.85				
GROUP B	**VAS**	1.8				
	ODI	7.95				

Table 3: ANOVA to compareVAS and ODI between Group A and Group B.

The above table 3 shows significant difference on VAS and ODI between Supine bridging over prone bridging Exercise groupwith P value <0.0001.

Group A Intervention is more effective with mean difference 1.95 and 8.85 of compare to mean difference of 1.8 and 7.95 in Group B.



Graph 3: Represents the difference on VAS and ODI between Group A and B.

Total 20 samples were participated in each group. Group A (Prone bridging) received elbow plank and extended plank exercises and Group B (Supine bridging) received traditional bridging and alternate single leg bridge exercise.

Low back Pain (VAS Scale) has been decreased in both the groups with significant difference P<0.0001. Mean difference in outcome was 1.95 and 8.85 within Group A and 1.8 and 7.95 within Group B rspectively on VAS and ODI.

On comparing the mean values of Group A and Group B on pain (VAS) and Functional disability (ODI) of both groups showed significant difference with p<0.0001. Group A (prone bridging exercise) shows 1.95 and 8.85 which is higher mean difference value than Group B (supine bridging exercise) 1.8 and 7.95 respectively.

DISCUSSION

A Total samples of 40 with the age group of 20-35 were participated in the study. On comparing the mean values of Group A and Group B on Oswestry Disability Questionnaire and VAS, both the groups showed significant difference with P<0.0001.

A Oswestry disability index (ODI) is a self reported based outcome measure used to quantify extend of disability related to low back pain. The ODI tool has been adapted for use by patients in several non-english speaking nations [9,10].

The prone bridge (plank) is one of the most frequently used exercises to strengthen the abdominal muscles. However, in the prone bridge, the muscle action is isometric, working in co-contraction to control the pelvis. During the prone bridge exercise,the external oblique demonstrated greater muscle activation.

Studies have reported that prone bridging exercise can improve postural control and can reduce low back pain. Smaller base of support in prone bridg exercise need more muscle effort, which can improve muscle strength and low back stability inturn can reduce low back pain. Prone bridge exercise can also improve coordination of low back and pelvic floor muscles [11,12].

Prone bridge exercise have shown more effect on joint reposition sense and improved joint proprioception than conventional bridge exercise on securing the stability of the body trunk. It has also proved more higher level effect on balance and motor control than a conventional bridge exercise [13, 14].

Ethical Clearance: Clearance was obtained from the Institutional ethical committee of Faculty of Physiotherapy, Dr MGR Deemed to be University, Chennai with Ref No.A-58/ PHYSIO/IRB/2018-2019, Dated: 07/01/2019.

Conflict of Interest: No conflict of interest to conduct this study.

Source of Fund: It was a Self financed study.

CONCLUSION

This study concluded that the subjects in group A performed prone bridging exercise have shown more improvement in reducing pain and improving functional activities than in Group B (supine bridging exercise) program in non specific low back pain.

The study shows Group A and group B with prone and supine bridging exercise has effective approach in reducing pain and improving functional activities and bring back them to the normal.

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