

Comparing the Effectiveness of Positional Release Therapy Technique & Passive Stretching on Hamstring Muscle Through Sit to Reach Test in Normal Female Subjects

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Abstract

Aim

To find out the effectiveness of Positional Release Therapy and Passive Stretching Techniques on lumbar flexion muscle range of motion flexibility outcome measurement in normal female subjects.

Methods

A total of 40 asymptomatic subjects among student community within 18 to 25 years of age were selected from vadodara city and from the department of physiotherapy, Sumandeep Vidyapeeth University, sampling method through convenient sampling. The subjects were randomly divided in two groups i.e. Group-1 given positional release therapy technique and Group-2 given passive stretching technique on hamstrings muscle respectively. Active lumbar flexion range was measured by Sit to Reach Test before and after the intervention. The data were collected and analyzed by Paired and unpaired 't' test method.

Results

The 't' showed a significant ($p=0.000$) post test measurement values for both the groups.

Conclusion

When comparing the results of both group post values, it shows p -value [0.933]. No statistically significant differences were found in between two groups post test values in bringing lumbar flexion movement flexibility more beneficial. Both techniques are equally effective in bringing lumbar flexion range of motion flexibility.

Key Words

Flexibility, Stretching, Positional Release Therapy, Sit to reach test.

Introduction

Flexibility is the ability to move a single joint or series of joints smoothly and easily through an unrestricted, pain-free range of motion. Flexibility is related to the extensibility of musculo-tendinous units that cross a joint based on their ability to relax or deform and yield to a stretch force.¹ It is important both inflexibility and hyper-flexibility can result in higher risks of injury. In addition, an imbalance in flexibility could predispose the individual to an increased risk of injury.² Mobility is maintained in most individuals by routine, daily use of their limbs and joints in normal daily activities. However, adaptive shortening can occur in those who spend long periods in single posture [e.g. sitting most of the day] and mobility can be lost. Normal mobility includes adequate joint range of motion and muscle

range of motion. Progressive adaptive shortening of the soft tissue occurs as the body responds to decreased loading. This shortening limits mobility and function, reducing the patient's ability to carry out normal activities of daily living, work or leisure activities. The patient accommodates these limitations by substituting other joints or limbs to achieve functional goals, thereby contributing to the disease.³ Forward bending is a coupled movement combining lumbar flexion and pelvic rotation, the so-called lumbar-pelvic rhythm. It results from coordinated activity between the back extensor muscles (erector spinae) and the hip extensor muscles (gluteus and hamstrings).⁴ The hamstrings are example of muscle groups that have a tendency to shorten.⁵ Stiffness in the hamstrings is often compensated by lumbar spine motion, placing more load on the spine. Lengthening the hamstrings minimizes the stress placed on the spine and is the basis for hamstring stretching, an approach used by some persons to remedy back pain.³ Muscle tightness can be present without a joint contracture. Multi joint muscles are particularly vulnerable to developing tightness, especially in those individuals who do not regularly perform stretching exercises.⁶ During forward bending, stiff hamstrings can restrict pelvic forward rotation, resulting in flexion stress on the lumbar spine.⁷ When limitation of joint motion is because of soft tissue shortening, stretching have been found to be effective⁶ and Positional Release Therapy is also a highly effective technique that helps reduce pain and restore function to muscles, bones, and joints⁸.

Numerous researchers have compared various stretching techniques to determine which technique is most effective for increasing joint range of motion (ROM). Static stretching is a commonly used method of stretching in which soft tissue are elongated just past the point of tissue resistance and then held in the lengthened position with a sustained stretch force over a period of time. Static stretching is an effective form of stretching to increase flexibility and a safer form.⁹ Positional release therapy is method of total body evaluation and treatment using tender points and a position of comfort (POC) to resolve the associated dysfunction. Positional Release Therapy is an indirect (the body part moves away from the resistance barrier, i.e. the direction of greatest ease) and passive (the therapist performs all the movements without help from the patient) method of treatment. As a result of treatment using PRT, there is a decrease in muscle tension, facial tension, and joint hypo-mobility. These changes in turn result in a significant increase in functional range of motion and decrease in pain.¹⁰ It is a hands-on treatment that alleviates muscle and connective tissue tightness by the use of very specific treatment positions held for 90-120 seconds.¹⁰ Many authors have studied different approaches of muscle stretching and the duration of application of such procedures but no studies were there in comparing the significant effect in relation to our topic.

Methodology

A total of 40 young female subjects among student community within 18 to 25 years of age were selected. This study was comparative study using convenient sampling. Orthopedics problem around hip, knee and spine, subjects with hamstring strain or contusion, Obesity, any congenital conditions or diseases in lower extremity are excluded. Subjects were volunteers and signed an approved informed consent statement.

Two groups were divided each into 20 and Group-1: were given positional release therapy technique, Group-2: were given passive stretching. First to check hamstring flexibility, the subjects did Sit to Reach Test and measurement were taken. Second, for group-1, positional release therapy technique was given in hamstring muscles and for group-2 passive stretching given. Again subjects did sit to reach test and measurement are recorded. Sit to reach test procedure is a test involves sitting on the floor with legs stretched out straight ahead. Shoes should be removed. The soles of the feet are placed flat against the box. Both knees should be locked and pressed flat to the floor - the tester may assist by holding them down. With the palms facing downwards, and the hands on top of each other or side by side, the subject reaches forward along the measuring line as far as possible. Ensure that the hands remain at the same level, not one reaching further forward than the other. After some practice reaches, the subject reaches out and holds that position for at one-two seconds while the distance is recorded.¹¹ In Positional release technique procedure, the subject lies supine with thigh extended and abducted off the edge of the plinth slightly, and then the knee was flexed passively to 40 degrees and adds slight adduction (varus force) and marked internal

rotation of the tibia. These positions were held for exactly 90 second and measured using a standard watch time and then limb were returned to the resting position.¹² In Passive stretching procedure, therapist kneels on plinth. With the subjects knee fully extended, supporting the subjects lower leg on therapist arm or shoulder. Stabilize the opposite extremity along the anterior aspect of the thigh with one hand. With the knee at zero degree extension, and the hip in neutral rotation, flex the hip as far as possible. These positions were held for exactly 60 seconds and were measured using a standard watch time and then limb was returned to the resting position.^{13, 15}

Data Analysis

Descriptive statistics including numbers, proportions, mean and standard deviations were used to present data. Student t-test (paired and unpaired) were used to compare data within group and in-between the two groups. A probability level of $p < 0.05$ will be accepted as statistically significant. SPSS version 16 will be used to analyze the data.

Table 1: Comparison of pre and post values for group-1 using paired t-test

BEFORE Positional Release Technique			AFTER Positional Release Technique			t-value
MEAN	Standrad Deviation	Standrad Error	MEAN	Standrad Deviation	Standrad Error	-10.384
24.1000	7.50018	1.67709	27.5500	7.13387	1.59518	

Table 2: Comparison of pre and post values for group-2 using paired t-test

BEFORE Positional Release Technique			AFTER Positional Release Technique			t-value
MEAN	Standrad Deviation	Standrad Error	MEAN	Standrad Deviation	Standrad Error	-6.909
23.6500	9.50083	2.12445	27.7750	9.56622	2.13907	

Table 3: Comparison of both group-1 and group-2 post test values using unpaired t-test

AFTER Positional Release Technique			AFTER PASSIVE STRETCHING			t-value	Sig 2(tailed)
MEAN	Standard Deviation	Standard Error	MEAN	Standard Deviation	Standard Error	-.084	.933
24.1000	7.50018	1.67709	27.7750	9.56622	2.13907		

Results

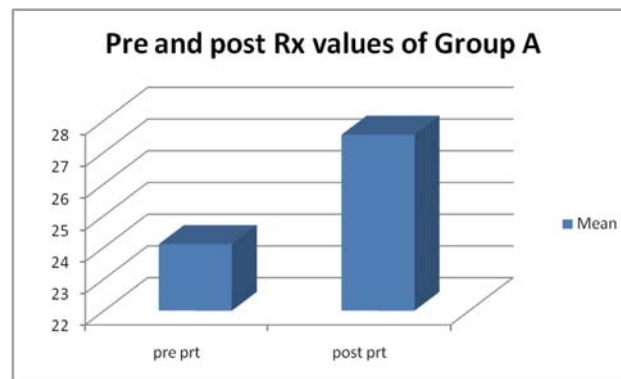
The data were collected and analyzed with Paired t-test and unpaired t-test methods. In group-1 the results shows that there were statistically difference in bringing hamstring flexibility ($p=0.000$). In group-2 the results.

Findings

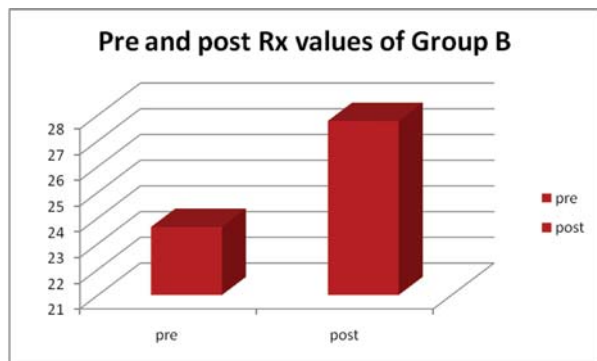
Flexibility is an important physiological component of physical fitness, and reduced flexibility can cause inefficiency in the workplace and is also a risk factor for low back pain. Increasing hamstring flexibility was reported to be an effective method for increasing hamstring muscle performance on selective isokinetic conditions (Worrell et al, 1994).^[14]

In our study, Subjects were not involved in any exercise activity at the start of the study and agreed to avoid lower-extremity exercises and activities other than those advised.

Group 1: Pre-test and Post-test values for Positional Release Technique in hamstrings muscle in Group-1



Group 2: Pre-test and Post-test values for Static Stretching Technique in hamstrings muscle in Group-2

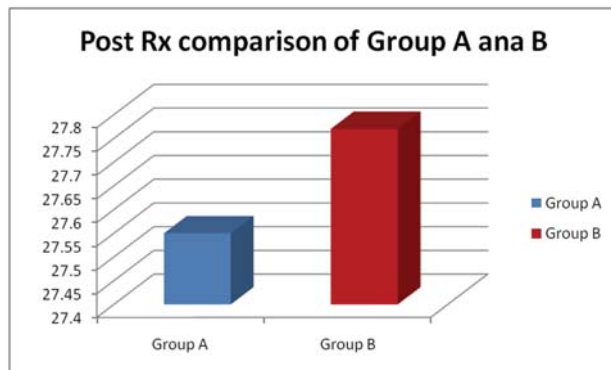


Muscle tightness is one of the limiting factors for restricted range of motion and reduced flexibility of joint. Especially hamstring muscles are more prone for tightness in sedentary life because of prolonged sitting posture and cause reduction in flexibility of lumbar movement in future days. The technique of relieving hamstring tightness used in this study was to passively and statically stretch the hamstring muscles. The outcome of this study revealed that both applications of static stretching as well as positional release technique procedures resulted in significant improvement in hamstrings muscle flexibility in the intervention groups. We selected this topic because many studies showed regarding static stretching beneficial effects and only few studies are there regarding positional release therapy. Both the techniques are easier for application. But when comparing the time and application methodology, static stretching was best then positional release therapy. Static stretching can be applied instantly but positional release therapy needed couch and more time because of positioning. Other side when viewing positional release therapy we can apply this technique to old age patients because the application method was easier, smooth manner and not forceful. The implication of this finding was that individuals with hamstrings tightness would benefit the same effect. The similarities between the post values of both group studies could be a result of the difference in the frequency and the duration for which the static stretching and positional release therapy were carried out, the procedure were carried out once in each subjects in our study and not continued for next day or weeks by several authors who did the same techniques on hamstring muscle. Our study was limited to the effects of stretching the hamstring muscles on lumbar flexion range of motion. Although 60-second, three times, single time bout of static stretching the hamstring muscles was found to be as effective, similarly positional release therapy was found to be as effective, studies are needed to evaluate the effects of various durations and of frequencies in stretching the hamstring muscle and on other muscles like back extensor muscles etc., We only examined static stretching of up to 60 seconds in duration and the positional release technique given for 90 seconds. Additional research is needed to evaluate whether durations of seconds or frequency of applications for few days will provide more flexibility. Because, the sample we taken for this study was relatively young, with a mean age of 26 years. Future research is needed on subjects in different age groups, sports injuries related conditions, OA knee patients, back pain patients etc.,

Conclusion

There were no difference in effects between static stretching and positional release therapy with post test values. Both the techniques are equally effective in bringing lumbar flexion range

Group 3: Post-test values of Positional Release Technique Group-1 and Static Stretching technique Group-2 in hamstrings muscle.



of motion flexibility. The results from this study will be helpful for individuals who desire to increase the flexibility in an attempt to increase lumbar flexion motion.

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