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Effectiveness of Myofascial Release on Neck Flexors in Hamstring Tightness Healthy Individuals

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Abstract: ***Purpose: The purpose of this study was to research the effect of performing myofascial release techniques in the neck flexor on the flexibility of the hamstring. Methods: Fifty persons with short hamstrings participated in this research. According to the results of the SLR Angle measurement test, the subjects were allocated to myofascial release technique to 50 individuals. The Myofascial release techniques were applied to the individuals. For the analysis, we used the straight leg raise (SLR) test for the flexibility of hamstring. Results: In the present study, marked improvement in the outcome measure of the study was SLR angle observed at pre - treatment (0 sitting) and just after the technique post treatment and compared statistically. There will be a significant change in the SLR after the intervention. Conclusion: Application of the myofascial release technique to persons with short hamstrings resulted in immediate increases in flexibility of the hamstring. However, we could see that the myofascial release technique was effective.***

Keywords: Myofascial Release, Straight Leg Raising Test, Goniometer, Muscle Tightness

1. Introduction

Hamstring tightness is not only a causative factor for reduced range of motion but it can also lead to various other musculoskeletal problems. Tight hamstrings are associated with a dysfunctional motor control pattern leading to a submaximal firing pattern of postural muscles resulting in function of hamstrings as stabilizers rather than their main function of prime movers. This change in primary function leads to the presentation of hamstring tightness [1]. Modern sedentary style of living is one of the main reasons for postural abnormalities evident in modern society. The prolonged sitting hours required in most of the jobs, and educational setups can affect flexibility of soft tissues, especially two joint muscles [2]. The straight - leg - raising (SLR) test is of great value in assessing normality of the roots of the sciatic nerve1, 2 and tightness of the hamstring muscles. The value of the SLR test can be determined with a goniometer a gravity - type goniometer or a tape measure [3]. Recently, it has been reported that the flexibility of the hamstring increased as a result of an intervention targeting the suboccipital muscle. Increase the flexibility of the hamstring may be because the superficial backline was relaxed through relaxation of the suboccipital muscles [4].

The Neck Is Connected to the Hamstrings

For example, if the deep core stabilizing system of your body is unstable, your nervous system will simply recruit more superficial power amplifiers to take over. One of the most common relationships is inhibition (weakness) of the deep neck flexors to facilitation (tightness) in the hamstring. Lack of stability in the neck causes a reflex compensation in the hamstrings to take over the job of the neck flexors. This relationship can commonly be seen in the standing to touch test. In this test, feet are together and legs are straight with no knee bending. Look down at your toes (neck flexors) and then flex forward at the waist to touch your toes. If the neck flexors are inhibited the nervous system senses threat and instability, so on the way down to touch the toes it stiffens the hamstrings so you don't fall forward hurting yourself. So, from this we learn that the key to power is not pressing harder on the gas pedal, but simply taking your foot off the brake [5].

Myofascial therapy can be defined as "the facilitation of mechanical, neural and psycho physiological adaptive potential as interfaced by the myofascial system. The purpose of deep myofascial release is to release restrictions (barriers) within the deeper layers of fascia. This is accomplished by a stretching of the muscular elastic components of the fascia, along with the crosslinks, and changing the viscosity of the ground substance of fascia. Myofascial release is a collection of techniques used for the purpose of relieving soft tissue from an abnormal hold of a tight fascia [6]. Myofascial Release techniques are utilized in a wide range of settings and diagnoses; pain, movement restriction, spasm, spasticity, neurological dysfunction, i. e., cerebral palsy, head and birth injury, CVA's, scoliosis, menstrual and pelvic pain and dysfunction, headaches, temporomandibular pain and dysfunction, geriatrics, sports injuries, paediatrics, chronic fatigue syndrome, fibromyalgi0a, traumatic and surgical scarring, acute and chronic pain [7].

2. Subjects and Methods

50 young healthy individuals with tight hamstring muscle were recruited from NEW HOPE PHYSIOTHERAPY REHABILITATION CENTER Laxmi Nagar Delhi, on the basis of fulfilment of inclusion criteria.

The criteria for selection of subjects were as follows.1 Age group of 18 - 26 years, with hamstring tightness.2 Both genders male and female.3 The angle of the SLR should be less than 80.4 Individual with normal mental stress with no neurological deficient.

The criteria for exclusion of subjects were as follows. Individuals with neck pain.2 Individuals with history of neck trauma [whiplash injury].3 Individuals with low back pain.4. Individuals with fracture of lower limb5. Individuals with Malignancy.

The SLR tests were used to evaluate the flexibility of the hamstring. Place the subject in supine position with both knees extended. Hold the knee of the lower extremity being tested in full extension. Keep the other lower extremity flat on the examining table to stabilize the pelvis and prevent excessive amount of posterior pelvic tilt and lumbar flexion. Flex the hip by lifting the lower extremity off the table. Keep the knee in full extension by applying firm pressure to the anterior thigh. As the hip flexes, the pelvis and low back should flatten against the examining table. The end of the testing motion occurs when the resistance is felt from tension in the posterior thigh and further flexion of the hip cause knee flexion, posterior pelvic tilt or lumbar flexion. Place the goniometer over the lateral aspect of the thigh using greater trochanter as reference. Then align the proximal arm with the lateral midline of the pelvis and align the distal arm with the lateral midline of the femur using the lateral condyle for reference. [8]

1) **Group A (Intervention Group): Received Myofascial fascial technique**

Scalene release – The subject was instructed to be in supine their head elevated and rotated to the contralateral side on the table with the therapist seated at the head of the table. The finger pad should be placed over the muscle, just inferior to superior was applied for five minutes.

Sternocleidomastoid release - The subject was instructed to be in supine their head elevated and rotated anteriorly to the contralateral side on the table with the therapist seated at the head of the table. The finger pad should be placed over the muscle, just inferior to superior was applied for five minutes.

Cranial base release – It is also known as suboccipital release.

The subject was instructed to be in supine on the table with the therapist seated at the head of the table. The finger pads should be placed over the suboccipital muscles bilaterally, just inferior to the superior nuchal line down atapproximately the level of C2 applied for five minutes. Traction is then applied with the fingers in an anterior, lateral, and cephalad direction. Therapist then uses twohandedcombination moved with greater ease. The treatment was given for 6 days a week for 3 weeks

2) **GROUP B (Control Group): received static stretching of hamstring 3 repetitions with 30 seconds hold [9].**

Results were analysed using SPSS 17.0, and the significancelevel was set at 0.05. To compare the effects of myofascial release on neck flexors, the pared t test was conducted, and to compare the effects between thepre and post reading, independent t - test was conducted.

3. Result

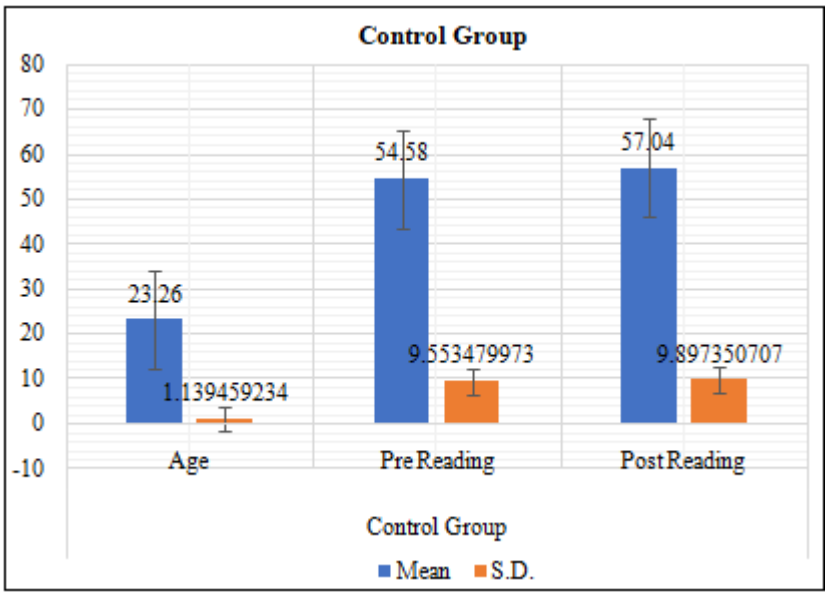
A total of 50 subjects are included in this study; conventional study includes hamstring muscle static stretching was given to 25 subject and suboccipital muscle technique was given to the 25 subjects.
Data analysis was performed on the following outcome measures.

Data were analysed at baseline and after 3 weeks of treatment. Confidence interval was kept at 95% and level of significance was kept at 0.05.

Table No: 1: Showing the Mean and Standard Deviation of Age, before and post reading of control group.

	Control Group		
	Age	Pre Reading	Post Reading
Mean	23.26	54.58	57.04
S. D.	1.139	9.553	9.897

According to the table no 1
The Mean and the standard deviation of the age value of the control group is 23.26 ± 1.139 with the pre reading is showing the scores as 54.58 ± 9.553 and the post reading scores are manifested as 57.04 ±9.897 respectively.

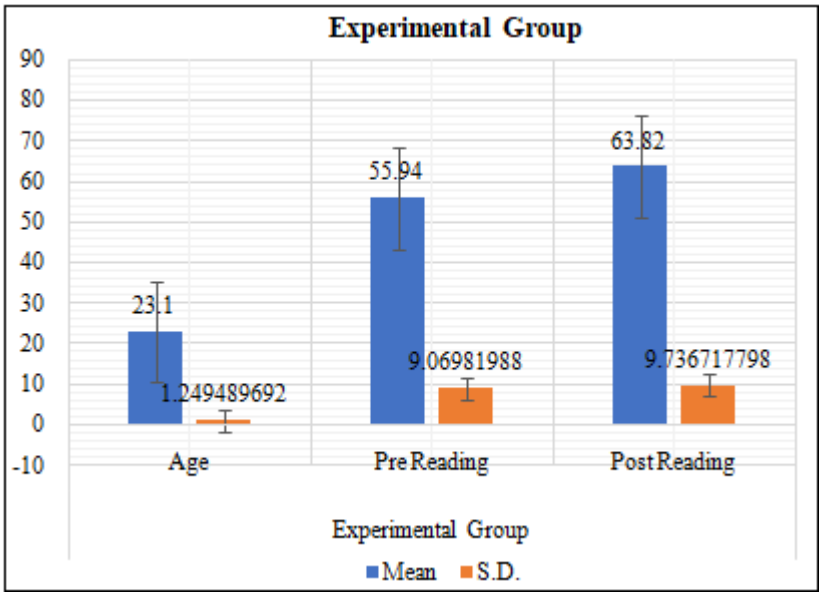


Graph 1: Graphical representation of the Mean and Standard Deviation of Age, before and post reading of control group

Table 2: Showing the Mean and Standard Deviation of Age, before and post reading of Experiment group

	Experimental Group		
	Age	Pre Reading	Post Reading
Mean	23.1	55.94	63.82
S. D.	1.249	9.07	9.737

According to the table no 1
The Mean and the standard deviation of the age value of the control group is 23.1 ± 1.2 with the pre reading is showing the scores as 55.94± 9.07 and the post reading scores are manifested as 63.82±9.737 respectively.



Graph 2: Graphical representation of the Mean and Standard Deviation of Age, before and post reading of Experiment group

4. Discussion

The aim of study was to observe the effect of myofascial release technique on neck flexors (sternocleidomastoid, scalene) and cranio basal release in patients of hamstring tightness. The patients those who received myofascial release technique on neck flexors post treatment improved significantly ($p<0.00$) as compared to those who received the technique on neck flexors pre. This study demonstrated that myofascial release technique on neck flexors to improved SLR angle in individual with hamstring tightness.

Recently, it has been reported that the flexibility of the hamstring increased as a result of an intervention targeting the suboccipital muscle. Increase the flexibility of the hamstring may be because the superficial backline was relaxed through relaxation of the suboccipital muscles [5].

Results agree with previously published studies on this subject indicating the ability of myofascial release technique on neck flexors to improve SLR angle. In this study the effect of performing the suboccipital muscle inhibition (SMI) and self - myofascial release (SMFR) techniques in the suboccipital area on the flexibility of then hamstring. The fact that both techniques could increase the flexibility of the hamstring may be because the superficial back line was relaxed through relaxation of the suboccipital muscles. The suboccipital muscles are the "proprioceptor monitors" that

contribute significantly to regulation of headposture, and they have the most muscle spindles in the human body. Among them, in particular, the rectus capitis posterior minor muscle, which has 36 muscle spindles per gram, is known to contribute greatly to regulation of posture and the degree of tension. A different approach i. e., cervical spine treatment that might avoid compressing or stretching irritable structures but still produce an increase in hip flexion range of motion and hamstring extensibility. Pollard and Ward reported change in the extensibility of hamstring muscle following application of cervical isometrics contract relax technique. They found significant increase in remote hip flexion range of motion. They also reported that this finding seems to be only short term in duration and did not report how long altered extensibility remained. This uncertainty about duration of this reported effect leads to difficulties in assessing this approach for therapeutic merit [10].

The remoteness of the site of treatment to the region of effect but there was lack of explanation for this effect. The present study along with these studies suggested new approach to the treatment of impaired hamstring extensibility and encouraged further investigation of remote effect of cervical treatment favouring the authors who concluded that manual therapy of neck may have a role to play in treatment of extra spinal lower limb musculoskeletal conditions. The proprioceptive neuromuscular facilitation techniques on the sub - occipital muscles and on the hamstring muscles, measuring the elasticity of the latter with the SLR test. The present study is supported by study done by Schleip13 whose findings revealed an increase in hamstring elasticity by 9%. Glen noted the presence of Myo - Dural Bridge connecting rectus capitis posterior minor muscles to the duramater. The present study along with these studies suggested new approach to the treatment of impaired hamstring extensibility and encouraged further investigation of remote effect of cervical treatment favouring the authors who concluded that manual therapy of neck may have a role to play in treatment of extra spinal lower limb musculoskeletal conditions [11].

5. Conclusion

The null hypothesis is rejected as a consequence of the study suggesting that the myofascial release technique is helpful on neck flexors with hamstring stiffness in the Experimental Group.

Ethical Clearance

The ethical clearance given by the IAMR with the reference no. of IAMR/6014/2021 - 2022.

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