

The Difference of Effectiveness Between Myofascial Release Technique and Contract Relax Stretching in Reducing the Ischialgia Patients' Pain

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Abstract

This study aimed to analyze the difference of effectiveness between myofascial release technique and contract relax stretching in reducing the ischialgia patients' pain by utilizing a quasi-experimental design. The subjects were 26 ischialgia patients who were divided into 2 groups. Each groups consisted of 13 patients who were chosen randomly. Before and after treatment, there would be the measurement of pain level by utilizing Visual Analogue Scale. Result of paired t-test sample showed that there was significant difference of pain level between before and after treatment of myofascial release technique which the mean difference was 4,254 ($p = 0.000$), as well as before and after the treatment of contract relax stretching which the mean difference was 3.67 ($p = 0.000$). Result of independent t-test sample showed that p-value was 0.110, which meant that there was no significant difference of pain level from both methods. However, it was concluded that myofascial release technique and contract relax stretching were effective in reducing the ischialgia patients' pain.

Keywords: Myofascial release technique, contract relax stretching, pain, ischialgia.

I. INTRODUCTION

Ischialgia is a daily common pain. It is estimated that almost everyone has suffered pain that spread to their legs during their lifetime. Patients feel pain that spread to their legs as long as the way of ischiadicus nerve or pain which is felt in waist which spread to the back of thigh to leg. Ischialgia is caused by stimulation of sensory nerve fibers from posterior radics L₄ to S₁, and pain can be occurred on every part of ischiadicus nervus before appearing on leg.¹ 80% of American people suffer low waist pain. It is estimated that approximately 15-20%, the pain developed to be referent pain, which spread to the legs and it causes the person is disability in doing his or her daily activities.¹ Ischialgia can be caused by muscular piriformis pressure which is located on back of thigh that causes irritation of ischadicus nerve fibers, hence, it causes a pain, which is from buttock area and spreads to the leg. Piriformis syndrome is usually happened during the fourth and fifth decade of work and activity levels. Piriformis syndrome is often followed by minor trauma on buttocks and pelvis.¹ Sofyan (2014) reported that in RSAD Pelamonia recorded 9 ischialgia cases with total visits to physiotherapy as much as 204 times and in RSUD Salewangan Maros recorded 62 patients who complained pain that spread to their leg.² Various methods of physiotherapy treatment to overcome the pain that spread to the leg were interference, microwave diathermy, Infrared rays, ischemic compression technique, hold Relax method, relax contract stretching, myofascial release technique, and mobilization of nerve.^{3,4,5,14,16.}

II. METHOD

This research was a quasi-experimental research by utilizing pretest - posttest of two group designs⁶ which was held in Physiotherapy Clinic of Ratulangi Medical Centre in Makassar in August to November 2016. The population was ischialgia patients who went to Physiotherapy Clinic of Ratulangi Medical Centre in Makassar (30 patients) over a period of two months. The sample size was determined by utilizing Krejcie-Morgan table, which if population was 30, the minimum sample would be 26⁷. The sample was divided into two groups, each groups were 13 members which were chosen randomly. In each groups, the pain was measured by utilizing Visual Analogue Scale (VAS), before and after treatment⁸. The collected data were analyzed by utilizing a paired t-test sample and independent t-test sample⁹.

III. RESULT

Table 1. The illustration of pain change between before and after myofascial release technique treatment

	VAS value of group I			paired t -test
	Pretest	Posttest	Mean difference	
Average	7,246	2,992	4,254	0,000
SD	0,849	0,676	0,173	

Table 1 showed the change in VAS average value was 7.246 ± 0.2355 cm before the treatment and it became 2.992 ± 0.1876 cm after the treatment, hence, the mean difference was 4.254 ± 0.0479 cm. Paired t-test sample showed p-value = 0.000 (there was a significant difference of pain level between before and after giving the treatment).

Table 2. The illustration of pain change between before and after giving contract riley stretching treatment

	VAS value of group II			paired t- test
	Pretest	Posttest	Mean difference	
Average	6,639	2,969	3,67	0,000
SD	0,897	0,627	0,27	

Table 2 showed that the average change in VAS value before the treatment was 6.639 ± 0.897 cm and it became 2.969 ± 0.627 cm after the treatment, hence, the mean difference was 3.67 ± 0.27 cm. Paired t-test sample showed p-value was 0.000 (there was a significant difference of pain level between before and after giving the treatment).

The result of pain level measurement of ischalgia patients after giving treatment between group I (myofacial release technique) and group II (contract riley stretching)

Table 3. The difference of pain level after myofascial release technique and after contract riley stretching treatment

Treatment	Average	SD	Mean difference	Independent t-test
contract riley stretching	2,770	0,662	0,5	0,110
myofacial release technique	3,270	0,668		

Independent t-test sample showed p-value was 0.110 (there was no difference between two groups). Based on the average value of VAS, myofacial release technique had higher mean difference value which was 3.270 ± 0.668 cm, meanwhile, the contract riley stretching group was 2.770 ± 0.662 cm.

IV. DISCUSSION

The pain level in group I showed that myofacial release technique could reduce pain of ischialgia. This could be happened because myofacial release technique was performed with isometric contraction and then, it was performed with relaxation to agonists and antagonist muscles.²¹ Kisner Carolyn and Lynn Allen Colby claimed that the isometric contractions on muscles and then followed by relaxation could reduce pain and muscle spasm through autogenic inhibition effect. When the muscles powerfully contracted, especially if the tension became excessive, then suddenly the contraction stopped and the relaxation was occurred.⁴ This relaxation was a response of strong tension, which was known as inverse stretch reflex or autogenic inhibition in accordance with the second law of Sherrington: if muscles received stimulation to contract, then antagonist muscle received impulses for relaxation. Isometric contractions could produce muscle relaxation through autogenic inhibition effect that made pain and spasm gradually decreased. If piriformis muscle became relaxed and spasm decreased, there would be a pressure reduction of ischiadicus nerve in gluteus area, and would create normal alignment lumbar vertebrae that eventually the pain would decrease.¹⁴ This was conformed by Subhangi P.Patil and Rites Gaigole's statement that myofacial release technique could reduce pain in patients with plantar facitis.¹⁵

A Riggs and Grent K.E. explained that myofacial release technique had a role in giving stretch and elongation of muscle structure and fascia, so that the pain could be reduced through the release of bond among fascia, integument, muscles and bones; then, fascia and muscles would be more flexible and would reduce spasms in extrafusal network.¹⁶ the reduction of spasms would reduce inflammation of spindle muscle, the feedback of motor nerve would reduce the release of excessive acetylcholine. These changes made blood circulation became normal so that the needs of oxygen for oxidation would be completed, calcium pumped back to the sarcoplasmic reticulum so that the release of acetylcholine by sarcoplasmic reticulum would stop which ended with a decrease of motor end plate. Muscles would undergo optimal relaxation, pain was reduced, hence, it influenced in declining the muscular work disability.^{17,21}

Measurement of VAS value in group II showed the decrease in pain level after intervention of contract riley stretching. This was conformed by Pratama's report that the administration of contract relax stretching could reduce upper trapezius pain in condition of myofascial trigger points. The decrease of pain in that area made a better muscular flexibility, then, it could increase the range of motion which was initially limited. Strong muscular contractions would ease pumping action, thus, local metabolism and circulation would be better, and at the same time, it would remove metabolic waste. Trucks of metabolic waste (P substance) and asetabolic which were produced by inflammatory process could be smoothly, then, the pain decreased.¹⁸

When a muscle was stretched, it would be occurred a neurophysiology response that was controlled by spindle muscle and Golgi tendon. Spindle Muscle had a function to monitor the speed and duration of strain, as well as with the sense of length muscle change. Spindle muscle fibers could feel the speed of muscle when it was stretched.⁴ Primary afferent nerve fibers (type Ia) and secondary (type II) emerged from spindle muscle and synapse with alpha or gamma motoneuron sequentially, and facilitated the contraction of extrafusal and intrafusal fibers. When the muscles were passively stretched, the initial elongation was occurred in sarcomeres and the tension dramatically increased. After stretching was released, the sarcomere was back to resting length position, thus, the muscles became flexible. Muscle contractions would stimulate Golgi tendon, then generate inhibition response, and the muscles became rileks.^{4,14}

Widodo.¹⁹ stated that contract rilex stretching could reduce patients' pain of myofacial upper trapezius because it could lengthen soft tissue structures such as muscle, fascia, tendons, and ligaments that originally shortened pathologically. Thus, it could reduce pain that was caused by spasm, shortening muscle, or fibrosis. Shrier and Gossal in Widodo, stated that mechanism of pain reduction by contract rilex stretching which there were spindle muscle and Golgi tendon in muscle's elongation and tension. Moreover, the main function of spindle muscle was to monitor the speed and stretching duration in the muscle through reflex action that began with strong contractions to reduce the stretching. Meanwhile, the role of Golgi tendon was to inhibit the muscle contractions and to have a very low threshold after contraction. Golgi tendon threshold would enhance when it performed muscle-stretching passively.¹⁹

Exercises with contraction and relaxation would produce lengthening effect on collagen fibers. Theoretically, flexion exercises could reduce pain by decreasing compression force on the piriformis muscle and stretching hip extensor⁴. Thus, ischialgia patients who received intervention of myofacial release technique would undergo the decrease of pain, hence, it could improve the mobility of hip and lumbar and the functional activities, regarding with the mobility of hip joint as what was suffered in subject of group I. The result showed that there was no significant difference of pain level between both groups which were treated by myofacial release technique and treated by contract rilex stretching, although the mean difference was higher in the group that was treated by myofacial release technique. This was happened because myofacial release technique worked to dismiss bonds between fascia, integument, bones, and muscles. Therefore, fascia would be more flexible and would reduce spasms in extrafusal network.²⁰

Myofacial release technique was a soft-tissue mobilization technique that was developed by John Bernes, which involved the gentle sustained pressure in subcutan and myofacial network. Myofacial release technique could stimulate structures in connective tissue, in particular mast cells which would produce histamine. Histamine was a vasodilator which would increase blood flow to treated area and other areas that received histamine through blood flow.^{20,21}

V. CONCLUSION AND SUGGESTION

Based on the result, it could be concluded that: 1) Myofacial release technique and contract rilex stretching could reduce ischialgia patient's pain; 2) There was no difference in the effectiveness of myofacial release technique and contract rilex stretching as the technique in reducing ischialgia patient's pain. Further, it was recommended that physiotherapists utilized both methods (myofacial release technique and contract rilex stretching) in treating ischialgia patients.

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