
THE EFFECTIVENESS OF COMBINED INTERVENTIONS OF INFRARED, TENS, MASSAGE RELEASE, SCALP MASSAGE, NECK PASSIVE STRETCH AND UPPER EXTREMITY STRETCH TO REDUCE PAIN AND INCREASE FUNCTIONAL ACTIVITY IN MYOFASCIAL TRIGGER POINT SYNDROME

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Abstract

Introduction: Long time in computer use and poor work attitude are risk factors for myofascial trigger point syndrome. Occupational overuse can cause adhesions to the myofascial upper trapezius and rhomboid muscles. This can cause local ischemia and tissue hypoxia due to the accumulation of lactic acid, causing pain and decreased functional activity.

Case Presentation: A 55-year-old patient with myofascial trigger point syndrome came to the FisioGo clinic Sragen. The patient complained of dizziness and pain in the upper trapezius and rhomboid muscles. Complaints are felt for one week and are very disturbing when on the move or not so lazy to do any activity. Pain is felt to increase when working long hours at the computer.

Management and Outcome: After being given a combination of physiotherapy interventions with two visits, the results of pain reduction were obtained using a silent visual analogue scale (VAS) T0:2 cm, T1: 1cm became T2: 0cm, press T0: 5cm, T1: 3cm became T2: 1cm, movement T0: 3cm, T1: 1cm, to T2: 0cm and increased functional activity with neck pain disability index (NPDI) T0: 38%, T1: 20% to T2: 2%.

Discussion: Infrared therapeutic effect is vasodilation which can facilitate blood circulation and relaxation. TENS can direct electrical pulses of light to nerves in the area experiencing pain and block pain impulses through large nerve fibers so that the body releases endorphins. Massage release affects the parasympathetic nervous system so that muscle relaxation and blood circulation become smooth in sending oxygen and metabolism to the central nervous system. Scalp massage controls stress which has a positive effect on blood pressure and stabilization of hormone levels because it can reduce sympathetic nerve activation while increasing parasympathetic nerve activation, resulting in a decrease in norepinephrine and cortisol secretion. Stretching can reduce the soft tissue adhesion of the upper trapezius and rhomboid muscles.

Conclusion: The combination of infrared, tens, massage release, scalp massage, passive neck stretch and upper extremity stretch with two patient visits can be effective in reducing pain and increasing functional activity in myofascial trigger point syndrome.

Keywords: Myofascial Trigger Point Syndrome, Infrared, tens, Massage, Stretching.

Introduction

Myofascial trigger point syndrome is a disease that can arise due to activation of trigger points in muscle fibers which can be caused by poor posture and wrong work attitudes. Work activities that use the upper trapezius and rhomboid muscles continuously and repeatedly can cause occupational overuse syndrome and one of the diseases that includes myofascial trigger point syndrome. The problem for people in Indonesia is neck, shoulder and back pain due to a static neck position or the wrong position when working in front of a computer in the office. Within 1 month the incidence of neck pain in Indonesia is 10% and 1 year 40%, while the prevalence is in the range of 6-67%, mostly women. (Falah, 2018). Myofascial trigger point syndrome resulting from occupational overuse can cause adhesions in the myofascial upper trapezius and rhomboid muscles. This can lead to local ischemia and tissue hypoxia in muscle cells resulting in a local decrease in pH and the release of substances that can stimulate muscle nociceptor activity. This is because the accumulation of lactic acid causes pain. If the pain lasts a long time and is not treated properly, it can lead to a decrease in functional activity.

Method

The research method used is a case study. The case study was carried out at the FisiGo Clinic, Sragen on the patient Mrs. U is 55 years old and works as a civil servant in the social service of Sragen. In this study, patients were given a combination of infrared intervention, tens, release scalp massage, neck passive stretch and upper extremity stretch in the case of myofascial trigger point syndrome. Infrared is given because it has a vasodilating effect and aims to improve blood circulation and relaxation. Infrared application with luminous type and a distance of 60 cm on the neck and upper left shoulder area for 15 minutes. Giving TENS with a time of 15 minutes is used to withstand pain and massage release in the muscles of the neck, shoulders and upper back as well as muscle scalp massage on the head. Massage is given because it can have an effect on the parasympathetic nervous system so that muscle relaxation and blood circulation become smooth in sending oxygen and metabolism to the central nervous system. The massage movement given is effleurage to be able to have an effect on increasing venous blood flow and lowering venous pressure and increasing arterial circulation. Kneading massage movements are also given in order to help launch venous return and increase blood vessel circulation so that pain is reduced. Stretching is given to reduce pain, restore joint range of motion, optimize neck and head posture, increase muscle strength in the neck, shoulders, scapula and upper extremities because stretching can reduce soft tissue adhesions the upper trapezius and rhomboid muscles. Passive neck stretching is given to the patient in a supine position and the

physiotherapist holds the patient's neck and head then moves the patient's neck towards flexion, lateral flexion and rotation with 8 movements each and every time the patient changes direction, they are asked to do breathing exercises. Upper extremity stretch is given with the patient sitting on a chair with both hands linked and then moved in the direction of flexion, extension, abduction and adduction of the shoulder so that the patient feels a stretch in the shoulder and upper back muscles.

Case Description

Mrs. U works as a civil servant in the social service of Sragen and is 55 years old. The patient complained of dizziness, pain in the shoulder area and near the left shoulder blade. One week the patient felt pain that was very disturbing when he was active or not, so he was lazy to do any activity. Pain is felt to increase when a lot of work in front of the computer. Then he checked himself into the FisioGo Sragen clinic to get physiotherapy services.

Outcome

Vital sign examination was normal in all aspects. On physical examination the patient complained of dizziness, pain in the shoulder area and near the left shoulder blade. Specific examination is a pain assessment on the VAS scale with a scale of 0 (no pain) and 10 (unbearable pain). In addition, special examinations for functional activities with NPDI. Patients answered 10 sessions (pain intensity, personal care, lifting weights, reading, dizziness, concentration, driving, sleeping activities, work and recreational activities). Each session was scored from 0 to 5, namely 0 (no pain) and 5 (unbearable pain). If 10 sessions have been graded, add up the scores divided by the number of sessions and multiply by 100 the result is a percentage. Interpretation of values 0-20% (mild), 20-40% (moderate), 40-60% (severe) and more than 60% (paralyzed).

Pain with Visual Analog Scale

Pain Classification	Before intervention	Before intervention (First visit)	After intervention (Second Visit)
Silent Pain	2	1	0
Tenderness	5	3	1
Motion Pain	3	1	0

From the results of the pain examination above, the patient on behalf of Mrs. U before the intervention (initial) for silent pain 2 and after the intervention at the first visit 1 and the second visit 0 (the patient does not feel

dizziness and pain in the muscles during sleep decreases), tenderness before intervention 5 (tenderness is felt to the head) after the intervention of the first 3 visits and after the second visit it became 1 (the pain was only felt in the area of the muscle that was pressed but still mild) while the motion pain before intervention 3 (movement could be full ROM but felt painful) and after the first visit intervention 1 became 0 (no pain) on the second visit.

Functional Activity Ability Test using the Neck Pain Disability Index

Assessment Aspect	Before intervention	After intervention (First visit)	After intervention (Second visit)
Pain Intensity	2	1	0
Personal care	2	1	0
Lifting weights	3	2	1
Read	2	1	0
Dizziness	3	1	0
Concentration	1	1	0
driving	2	1	0
Sleep activity	2	1	0
Work activity	2	1	0
Recreation	0	0	0
Amount	19	10	1
Percentage	38%	20%	2%

The results of the examination of the ability of functional activities with NPDI obtained a percentage of the index value of 2% where the interpretation is limited to light.

Results

After being given a combination program of physiotherapy intervention with 2 visits, Mrs. U experienced a decrease in pain with the VAS scale, which was originally silent pain from 2 to 0, tenderness from 5 to 1 and motion pain from 3 to 0. The ability of functional activity with NPDI obtained an initial score of 38% (moderate) down to 20% and 2% (mild).

Discussion

Working with computers for long periods of time and non-ergonomic work attitudes are risk factors for the occurrence of myofascial trigger point syndrome which causes adhesions to the myofascial upper trapezius

and rhomboid muscles resulting in local ischemia and tissue hypoxia due to accumulation of lactic acid, causing pain. If the pain lasts a long time and is not treated properly, it can lead to a decrease in functional activity. This patient after being given the intervention of infrared, tens, massage release, scalp massage, neck stretch, upper extremity stretch there is an effective improvement in aspects of measuring VAS and NPDI.

The combination of physiotherapeutic actions given include infrared intervention, tens, massage release, scalp massage, passive neck stretch, and upper extremity stretch aimed at reducing pain and increasing functional activity. Infrared to reduce pain with the effect of heat and vasodilation of blood vessels that causes blood flow to increase, and substance P is released through the tissue so that pain is reduced (Kharismawan et al, 2017). TENS is given to direct light electrical pulses to nerves in the area experiencing pain (trigger points) whose work blocks pain impulses through large nerve fibers so that the body releases endorphins so that pain is reduced, and functional activity is increased (Chiou et al, 2019). Massage release is given because it can have an effect on the parasympathetic nervous system so that muscle relaxation and blood circulation become smooth in sending oxygen and metabolism to the central nervous system. The massage movement given is effleurage to be able to have an effect on increasing venous blood flow and lowering venous pressure and increasing arterial circulation. Kneading massage movements are also given in order to help launch venous return and increase blood vessel circulation so that pain is reduced (Moraska, et al, 2017). Two neuroendocrine systems are related to stress as follows 1) The sympathetic system of the adrenal medulla is the axis involved in the secretion of epinephrine and norepinephrine and 2) Hypothalamic pituitary adrenal medulla (HPA) axis is involved in cortisol secretion. The physiological effects of scalp massage include 1) Relaxation effect, which involves hypothalamic reactions associated with a decrease in blood pressure activity of the sympathetic system and increased activity of the parasympathetic system and 2) The stimulating effect of scalp massage is reflexive and mechanical which can be refreshing and relaxing because it provides stimulation to the body, cutaneous peripheral nerves to the cerebrum. Peripheral skin stimulation improves circulation through stimulation parasympathetic nerves, muscle relaxation and expansion of capillaries. This can reduce sympathetic nerve activity while increasing parasympathetic nerve activity. Scalp massage can control stress which has a positive effect on blood pressure and stabilization of hormone levels (Kim et al, 2016). Stretching is given to reduce pain, restore joint range of motion, optimize neck and head posture, increase muscle strength in the neck, shoulders, scapula and upper extremities because stretching can reduce soft tissue adhesions. Passive neck stretching is given to the patient in a supine position and the physiotherapist holds the patient's neck and head then

moves the patient's neck (Buttogat et al, 2021). Upper extremity stretch is given with the patient sitting on a chair with both hands linked and then moved towards flexion, extension, abduction and adduction of the shoulder so that the patient feels a stretch in the shoulder and upper back muscles (Boonruab et al, 2021).

Conclusion

The combination of infrared, tens, massage release, scalp massage, passive neck stretch and upper extremity stretch with two patient visits can be effective in reducing pain and increasing functional activity in myofascial trigger point syndrome.

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