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Pengaruh Ultra Sound Dan Terapi Latihan Terhadap Carpal Tunnel Syndrome di RSUD Kota Semarang

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Abstrak
Carpal Tunnel Syndrome (CTS) is the most frequent neuropathy entrapment occurred at thewrist. During 2003 to 2005 an increase is happened in cases of Carpal Tunnel Syndrome (CTS) on employees due to repetitive motion on the use of the computer in thefrequency which is often a long and duration of 76 cases into 112 cases. Formulation of the problem in this research is how the influence of ultra sound and therapy exercise in people with carpal tunnel syndrome. The population of this research is the patients suffer of whose suffers from of carpal tunnel syndrome in RSUD Kota Semarang was 10 patients in its entirety is taken as a sample of the research. The collection of data was obtained from the examination of the pain with the visual analog scale (VAS). Visual Analogue Scale (VAS) is as an examination of the degree of pain. Test results showed that Sig. = 0.000 (< 0.05), Ho is rejected and Ha is accepted. This means that a pain before and after the Action of uses of ultra sound and therapy exercise (free assisted exercise, exercise, exercise assisted-resisted and resisted exercise) is not same. Based on the results of the research, it can be concluded the presence of the influence of the use of ultra sound and therapy exercise (free assisted exercise, exercise, exercise assisted-resisted and resisted exercise) against the pain in case of Carpal Tunnel Syndrome (CTS).

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1. INTRODUCTION

Carpal Tunnel Syndrome (CTS) is an entrapment neuropathy that most often occurs in the wrist. This syndrome occurs due to pressure on the median nerve as it passes through the carpal tunnel in the wrist, precisely under the flexor retinaculum. This syndrome can also be caused by compression of the arteries and veins so that the blood supply to the median nerve is reduced. In the past, this syndrome was also called acroparesthesismedian thenar neuritis or partial thenar atrophy. The term Carpal Tunnel Syndrome was introduced by Moersch in 1983 (Binhasyim, 2009).

People who are at great risk of developing carpal tunnel syndrome include types of work that involve a lot of use of their hands for long periods of time. These jobs generally use a combination of strength and repetition of the same movements in the fingers and hands, such as: jobs that often use computers, dentists, guitarists, teachers, housewives and field workers who operate vibrating tools such as drills and also ride motorbikes. In 1998 the incidence of carpal tunnel syndrome was approximately 515 per 10,000 population (Rambe, 2004).

In Indonesia, the order of prevalence of CTS in work problems is not yet known because until 2001 there were still very few diagnoses of occupational diseases reported due to various reasons, including the difficulty of diagnosis. Research on occupations with high risk to the wrist and hand reports a prevalence of CTS between 5.6% and 15%. Harsono's research on workers at a tire company in Indonesia reported a prevalence of CTS in workers of 12.7% (Tana, L. et all, 2004).

In Indonesia, from data from a survey conducted by researchers on 14 computer operators related to typing activities, the following results were obtained: 42.8% felt pain in their fingers and wrists, 21.4% felt pain in their hands like being stabbed, 28.6% felt tingling. 14.2% felt numbness in their fingers, 14.2% felt their fingers were stiff, and 14.2% felt their grip strength had decreased. Stevens et al reported that in the Netherlands, in 1976-1980 the incidence was 173 per 100,000 female patients/year and 68 per 100,000 male patients/year (Robert, 2009). During 2003 to 2005, there was an increase in CTS cases in employees due to repetitive movements when using computers frequently and for long durations from 76 cases to 112 cases. Problems that arise in carpal tunnel syndrome are pain felt in the wrist area, limited movement or joint range of motion (LGS) and decreased muscle strength. Ultra Sound (US) is a physiotherapy modality in the form of sound waves with a frequency of more than 20,000 Hz with a wavelength of 1.5 mm. Ultra sound is used for various purposes, one of which is therapeutic (Sujatno et.all, 2002). In this case, the role of physiotherapists is needed to help patients recover, that physiotherapy is a form of health service aimed at individuals and/or groups to develop, maintain and restore body movement and function throughout the life cycle by using manual treatment, increased movement, equipment (physical, electrotherapeutic and mechanical), functional and communication training (Minister of Health of the Republic of Indonesia, 2007)

Exercise therapy is a technique to restore and improve movement and function. The implementation of exercise therapy uses both active and passive body movements to maintain and improve strength, endurance and

cardiovascular abilities, mobility and flexibility, relaxation and coordination, balance and functional abilities (Kisner, 1996). Exercise therapy is a physiotherapy modality using both active and passive body movement exercises. Exercise therapy aims to increase the range of motion of joints and can strengthen muscles. Muscles can be repaired with exercise therapy that is carried out regularly and repeatedly. The exercises can be done in various positions and according to the size which can increase the range of motion of the joints in the hand and as long as it does not cause excessive pain.

For patients, if they feel pain, exercises are given to involve muscle movements that cause as little pain as possible. Exercise therapy is carried out correctly, repeatedly, regularly and continuously (Sujudi, 2009).

Objective of exercise therapy are (1) increasing the patient's activity, (2) increasing the patient's existing ability to be able to carry out movements that function and have a specific purpose, so that they can carry out normal activities (Priyatna, 1985). The exercise therapy given to carpal tunnel syndrome sufferers includes active and passive movement exercises.

Active exercise is a movement that is carried out consciously and causes muscle contractions from within, whether working against external forces or without opposing external forces

(gravity). According to Sujudi (2009) active exercise therapy can be divided into free exercise, assisted exercise, assisted-resisted exercise and resisted exercise. Rica, T., (2013) stated that group one treatment, namely a combination of exercise therapy and US, can reduce pain complaints in Plantar Fasciitis sufferers better than group two treatment, namely a combination of massage and US. Based on the problems above, the problem formulation in this research is how ultra sound and exercise therapy influence carpal tunnel syndrome sufferers.

2. THEORETICAL FRAMEWORK

a. Definition

Carpal Tunnel Syndrome (CTS) is an entrapment neuropathy that occurs due to

compression of the median nerve as it passes through the carpal tunnel in the wrist, precisely under the flexor retinaculum (Rambe, 2004).

b. Etiology

In general, the causes of carpal tunnel syndrome are heredity, work, trauma and inflammation. Carpal tunnel syndrome occurs when the tissue around the flexor tendons in the wrist swells and presses on the median nerve (Mujianto, 2013).

c. Pathophysiology

In general, CTS occurs chronically due to mechanical and vascular factors. Mechanical factors in the form of repetitive movements with strong contractions cause swelling of the tendon sheath in the carpal tunnel which then causes pressure on the median nerve. Meanwhile, vascular factors include strong, prolonged and repeated pressure which will cause an increase in intravascular pressure so that intravascular blood flow slows down and damages the endothelium causing local pain (Eka, 2005).

d. Clinical Signs and Symptoms

Clinical signs and symptoms of CTS include numbness, tingling and pain in the hands, a feeling like an electric shock in the thumb, index and middle finger (Mujianto, 2013).

e. Differential diagnosis

Differential diagnoses in CTS cases include Cervical radiculopathy, Pronator teres syndrome, Thoracic outlet syndrome, and De quervain's syndrome (Laillya N, 2010).

f. Prognosis

The prognosis for this syndrome is good and disappears within a few months if appropriate therapy and good education is given and the manifestation is only sensory disorders without motor disorders (Rambe, 2004).

g. Intervention Technology

UseUltra sound in cases of carpal tunnel syndrome is to increase blood circulation due to the micro massage effect it creates and causes a thermal effect, causing muscle relaxation.

h. Exercise therapy

According to Arovah (2010), there are several types of exercise therapy used in cases of carpal tunnel syndrome, including:

i. Active exercise

Is a movement that is done because the strength of one's own muscles and limbs without assistance, movement produced by contraction against gravity.

j. Passive exercise

It is a movement exercise carried out with external assistance and is not a conscious muscle contraction. According to Kisner and Colby (2007), passive exercise causes the effect of reducing pain due to smooth blood flow and relaxes the area around the joints so that it can increase LGS and maintain muscle elasticity.

k. Resisted active exercise

Resisted active exercise can increase muscle strength because if resistance is given to contracting muscles, the muscles will adapt by increasing muscle strength as a result of neural adaptation and increased muscle fibers (Kisner and Colby, 2007).

3. RESEARCH METHOD

This study was carried out at the Semarang City Regional Hospital in March 2020. The therapeutic measures provided included free exercise, assisted exercise, assisted-resisted exercise and resisted exercise. Free exercise is a movement carried out by the strength of the muscles concerned, without using help or resistance from outside other than the force of gravity. Assisted exercise is movement that occurs due to the work of the muscles concerned

without resistance

external resistance (gravitational force). Assisted-Resisted Exercise is a movement that occurs due to the work of the muscles concerned without fighting the force of gravity, but each movement is given a little resistance (resisted) manually. Resisted Exercise is an exercise that is carried out by providing resistance (resisted) to the muscles that are contracting to form a movement. The population of this study were patients suffering from carpal tunnel syndrome at the Semarang City Regional Hospital. This research sample used the entire population, namely 10 people. Data collection was obtained from pain examination with a visual analog scale (vas). Visual Analog Scale (VAS) as an examination of the degree of pain.

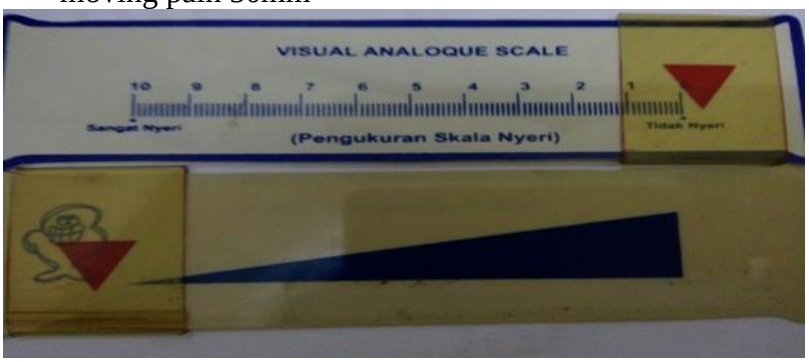
How to measure the degree of pain by showing one point on the pain scale line (0-10cm). One end shows no pain and the other end shows severe pain. The length of the line from the point of no pain to the designated point indicates the amount of pain (Basuki et.al, 2002).

Data analysis is in the form of quantitative descriptive, namely explaining qualitative data and quantitative data using the t test to prove the influence of each variable. The dependent variable is the provision of ultra sound and exercise therapy (free exercise, assisted exercise, assisted-resisted exercise and resisted exercise), while the independent variable is pain examination and decreased functional activity.

4. RESULTS AND DISCUSSION

Pain examination is carried out to determine how much pain the patient feels. The therapist gives instructions to the patient to indicate the pain scale on the Visual Analogue Scale (VAS). There are 3 categories of pain descriptions, namely pressure pain, movement pain and silent pain. Pressure pain is applied to the area of complaint by pressing with the therapist's hand. Motion pain means the patient moves the finger in all directions and for silent pain, the therapist asks the patient when the finger is still, whether there is pain and grade it using the Visual Analogue Scale (VAS).

Examination of the Degree of Pain with Visual Analog Scale (VAS) Silent pain = 0mm, tender pain 39mm, moving pain 50mm



Research conducted on carpal tunnel syndrome sufferers at Semarang City Regional Hospital in March 2020, with 10 samples given exercise therapy to overcome problems in the form of pain and decreased functional activity. The results of the examination are shown. Based on the results, it can be seen that there was a decrease in the average pressure pain, from a scale of 3.90 to 2.60. A decrease was also shown in motion pain and silent pain, namely from a scale of 5.00 to 3.50 and from a scale of 2.10 to 1.20, respectively. Which means t = 6.091 with Sig. = 0.000 (<0.05), then Ho is rejected and Ha is accepted. This

means that the pressure pain before and after the use of ultra sound and exercise therapy (free exercise, assisted exercise, assisted-resisted exercise and resisted exercise) is not the same, which means the use of ultra sound and exercise therapy (free exercise, assisted exercise, assisted-resisted exercise and resisted exercise) has an influence on pressure pain. This influence can also be seen as a positive influence in the form of a decrease in the average pressure pain scale on the Visual Analogue Scale (VAS).

The ultra sound modality can reduce pain due to heat/thermal effects because the micro massage caused by ultrasound will cause a heat (thermal) effect in the tissue. How much heat effect is produced is not the same for each tissue, it is determined by the intensity and duration of therapy. The effect of this heat effect can be increasing blood circulation, muscle relaxation, increasing tissue regeneration ability, reducing pain and others (Sujatno et al, 2002). Things that are necessary in determining the dose according to Sujatno et.al. (2002) are that the frequency of therapy depends on the condition of the disease. In acute conditions it can be given every day. Meanwhile, in chronic conditions 2-3 times per week, the intensity can be divided into 3, namely 1.2-3 W/cm2 (strong), 0.3-1.2 W/cm2 (moderate), <0.3 W/cm2 (low) and the duration of therapy depends on the area of the ERA and the area to be treated, for example in therapy using an ERA with an area of 3 cm2 and a therapy area of 15 cm2, the duration of therapy is 5 minutes (obtained from the area of the therapy area divided by the area of the ERA). The decrease in functional activity that occurs here is that the patient has difficulty carrying out daily work, due to pain and limited range of movement, so that carrying out excessive activities such as riding a motorbike, cooking, sweeping the patient experiences difficulty. Exercise therapy for carpal tunnel syndrome is resisted active exercise, which is an exercise that is carried out by providing external resistance to the work of the muscles that form a movement. The external resistance can come from manual or mechanical resistance (Kisner, 1996).

5. CONCLUSION AND SUGGESTIONS

Based on the results of data analysis and discussion, it can be concluded that ultra sound and exercise therapy can reduce pain in carpal tunnel syndrome sufferers. Based on the research conclusions, it is recommended that further research is needed regarding the influence of ultra sound and exercise therapy on carpal tunnel syndrome.

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