BENEFITS OF ULTRASOND, TENS AND HOLD RILEX STRECHING IN OSTEOARTHRITIS GENU DEXTRA : A CASE STUDY

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Abstract

Introduction*:* Osteoarthritis is a progressive, degenerative joint disease in which the cartilage that protects the ends of the bones begins to break down, accompanied by reactive changes at the joint edges and subchondral bone that cause pain and loss of movement.Based on the results of health research on the basis of Riskesdas in 2013, the prevalence of joint disease based on health diagnoses in Indonesia was 11.9% and 24.7% based on symptoms. The highest prevalence based on diagnosis by health workers was in Bali 19.3% while based on symptoms the highest was in East Nusa Tenggara 33.1%, West Java 32.1%, DKI Jakarta 21.8% when viewed from age characteristics, the highest prevalence was at age ≥ 75 years (54.8%) there were also more female patients (27.5%) compared to men (21.8%).
Case Presentation*:* A 56 year old man came to RSJD Dr. Arif Zainuddin Surakarta with complaints of pain in the right knee and could not fully bend because he had experienced a fall and slipped on the right knee. He has hypertension, diabetes and cholesterol. On physical examination with vital signs heart rate 99 beats/minute, respiration 20 beats/minute, blood pressure 170/100 mmHg with a height of 155 cm and a weight of 74 kg. From the static inspection examination found edema and dynamic inspection it was seen that he walked slowly and endured a little pain and seemed to be using a tripod.
Results **:** From the examination of pain using a vase on the right knee, the results were: silent pain (2), motion pain (4), tenderness (4). Measuring muscle strength with MMT on the right knee with flexion extension movement obtained 4 results. Anthropometric examination of the odema using the mid line with the results of the right knee (42 cm), left knee (36.5 cm) which means a difference of 5.5 cm. Then a special examination was carried out on OA using the Jette scale and measuring the LGS with a goniometer
Conclusion **:** After using ultrasound, electrical stimulation, hold rilex in the Osteoarthritis Genu Dextra Case with Ultrasound, Electrical Stimulation and Exercise at RSJD Dr. Arif Zainuddin Surakarta isA patient with a diagnosis of osteoarthritis, male, 56 years old, was given physiotherapy treatment for two treatments from June 26 2023 to July 4 2023. The problems with physiotherapy were found to be pain, decreased strength of the right knee muscles, edema on the knee dextra and decreased functional activity. After being treated twice, the results showed that there was no increase in MMT in the knee flexor-extensor muscles, there was no decrease in tenderness, silent pain, and motion pain, but there was a decrease in dextra knee edema, and there was no increase in functional activity.

Keyword: pregnancy, PPGP management, physiotherapy, LMIC

Introduction

*Osteoarthritis*is a progressive degenerative joint disease in which the cartilage that protects the ends of the bones begins to break down, accompanied by reactive changes at the joint edges and subchondral bone that cause pain and loss of movement. (selviani et al, 2019).

The exact cause of *Osteoarthritis* unknown but based on a number of studies it is known that the cause is multifactorial. The main risk factor for*Osteoarthritis*namely age, female gender, obesity, physical activity, genetic factors, race, joint trauma, and chondrocalcinosis. Sedentary lifestyle, obesity and metabolic diseases such as diabetes can exacerbate the disease*Osteoarthritis*. Osteoarthritis is also more common in pre-menopausal women who have low estrogen levels, are overweight, and are still active at work. (According to the World Health Organization (WHO) in 2017, it is known that osteoarthritis affects 151 million people worldwide and reaches 24 million people in the Southeast Asia region. Osteoarthritis is a chronic disease whose cause is not known with certainty, but it is characterized by bone loss. .(Herawaty, 2022).

Knee osteoarthritis pain is divided into inflammatory, nociceptive, and neuropathic. Inflammatory pain results from ischemia and tissue necrosis. Nociceptive pain results from unusual stimuli in the nociceptive pathways in the peripheral and central nervous systems. The exact cause of knee osteoarthritis is unknown, here are the triggering factors or predisposing osteoarthritis, namely (1) age, (2) obesity, being overweight (overweight) will cause excessive burden on joints that support a lot of weight, (3) gender , (4) physical activity and work, (5) Other joint diseases (putera et al, 2022).

In Indonesia, the incidence of osteoarthritis is quite high. According to UN estimates, by 2025, it is estimated that there will be around 74 million elderly people in Indonesia, which is about 25% of the total population. The Central Statistics Agency (BPS) also reports that by 2045, Indonesia will have around 63.31 million elderly people, or nearly 20% of the total population. The prevalence of osteoarthritis by age group in Indonesia is also quite high, which is around 5% at the age of 40 years, 30% in the age range of 40-60 years, and reaches 65% in the elderly (elderly) over 61 years (Fatmala & Nur Hafifah, 2021).

One therapy*Osteoarthritis*What is often used in medical rehabilitation is non-pharmacological therapy, namely ultrasound therapy. Ultrasound therapy can cause biological responses, muscle relaxation, tissue regeneration, and reduce inflammation. Based on the results of ultrasound therapy effect studies, this therapy is effective in reducing pain and improving physical function in patients*Osteoarthritis*knee. (son, 2022).

The second physiotherapy treatment that is carried out is using TENS. Transcutaneous Electrical Nerve Stimulation (TENS) is a form of peripheral electrical nerve stimulation through

the

skin, which is used to obtain electroanalgesia and is also used as a nerve tracker, to locate percutaneous nerves, to maintain muscle activity and for muscle development and TENS aims to stimulate peripheral electrical nerves through the skin, which is used to obtain electroanalgesia (Baruna, 2023).

Hold Relax Steartching Exercise Therapy can reduce spasms and facilitate muscle relaxation to increase the range of motion of joints / LGS from joints that experience limitations due to*Osteoarthritis*GENU (Khairurizal, 2019).

Case Presentation

A 56 year old man came to RSJD Dr. Arif Zainuddin Surakarta with complaints of pain in the right knee and could not fully bend because he had experienced a fall and slipped on the right knee.

He has hypertension, diabetes and cholesterol. On physical examination with vital signs heart rate 99 times/minute, respiration 20 times/minute, blood pressure 170/100 mmHg with a height of 155 cm and a body weight of 74 kg. From the static inspection examination found odema and dynamic inspection it was seen that he was walking slowly and with little pain and appears to be using a tripod.

On palpation examination found quadriceps muscle spasm and on auscultation examination there was crepitus when flexed extension of the right knee. When examining basic movements, namely active movements, flexion and extension movements on the right knee are not full ROM and positive for pain. Passive movements obtained flexion and extension movements on the right knee not full ROM and positive pain and firm end feeling. In isometric movements, resistance can be resisted by physiotherapy in flexion extension movements of the right knee but not full ROM and there is pain.

From the examination of pain using VAS on the right knee, the results were: silent pain (2), motion pain (4), tenderness (4). Measuring muscle strength with MMT on the right knee with flexion extension movement obtained 4 results. Anthropometric examination of the odema using the mid line with the results of the right knee (42 cm), left knee (36.5 cm) which means a difference of 5.5 cm . Then a special examination is carried out on*Osteoarthritis*using the Jette scale and measuring the LGS with a goniometer.

From these examinations, physiotherapy problems were found, namely the presence of pain in the dextra knee, a decrease in ROM of the dextra knee, and a decrease in flexor and extensor muscle strength in the dextra knee which causes the patient to have difficulty sitting up and

standing and walking..

Ultrasound intervention with intensity of 2 w/cm2, duration of 3 minutes, frequency of 3 MHz, TENS with intensity of 7 mA, duration of 15 minutes and frequency of 100 Hz, and hold rilex stretching was given 8 times in 4 sessions.

Table 1. description of the value of the jatte scale

1. Pain rating table

Mark	Pain description
Value 1	No pain
Grade 2	Mild pain
Grade 3	Moderate pain
Grade 4	Severe pain

2. Difficulty rating table

Mark	Difficulty description
Value 1	Easy
Grade 2	Rather easy
Grade 3	Not easy
Grade 4	It's kinda hard
Grade 5	Difficult

3. Dependency rating table

Mark	Dependency statement
Value 1	No help
Grade 2	Need help
Grade 3	Need help from others
Grade 4	Need the help of others and tools
Grade 5	Can't do

Table 2. Jatte scale measurement results

No	Evaluation	painful	difficulty	dependency
1	Stand up from a sitting position	2	2	2
2	Walk 15 meters	3	3	2
3	Go up the 3 trap ladder	3	2	2

Table 3. Description of the value of muscle strength

Scale	Information
0	Undetectable muscle contractions (complete paralysis)
1	No movement, muscle contractions can be palpated or seen
2	Full muscle movement against gravity with support
3	Normal movement against gravity
4	Full normal movement against gravity and against minimal resistance
5	Normal muscle strength, normal full range of motion against gravity and against full resistance

Table 4. Results of Measurement of Muscle Strength

	Movement	Results
Knee dextra	flex	4
	extension	4

Table 5. Vas (pain) scale measurements

Mark	Information
Value 0	No pain
Grade 1-2	Mild pain
Grade 3-4	Moderate pain
Grade 5-6	Severe pain
Grade 7-8	It hurts so much
Grade 9-10	The pain is unbearable anymore

Vase Table Results

Painful	Results
Silent pain	2
Motion pain	4
Tenderness	4

Discussion

This case report shows the findings of spasm in the quadriceps oateoarthritis genu dextra muscle in a 56-year-old man with complaints of pain in the right knee and unable to bend fully with a history of hypertension, diabetes and cholesterol. Osteoarthritis is the most common joint disease and is found throughout the world, especially in Indonesia. Osteoarthritis ranks second after cardiovascular disease. In the UK there are 1.3 million to 1.75 million people suffering from osteoarthritis. WHO data shows that in Indonesia the prevalence of osteoarthritis is 8.1% of the total population. (selviani et al, 2018).

*Osteoarthritis*most well-known for its effect on articular cartilage, which is severely degraded during the course of the disease. Articular cartilage is the smooth cartilage at the ends of long bones and within the intervertebral discs. This provides a low friction surface for articulation while being able to transmit heavy loads. Despite the long half-life of collagen in cartilage, healing is very slow, even with minor injuries. Although cartilage undergoes the most prominent changes. All joints are affected, synovium, joint ligaments, and subchondral bone (Caldera et al, 2019)

Ultrasound(US) is a physiotherapy modality that uses sound waves with mechanical vibrations to form longitudinal waves and travel through certain mediums with varying frequencies of more than 20,000 Hz. In practice it is common to use 0.7 Mhz and 3 Mhz. the shape of the ultrasound wave is longitudinal Hold Relax Stretching uses isometric contraction of the antagonist muscle in carrying out the treatment, this contraction can be done for 6 seconds because at 6 seconds the muscle will carry out metabolic processes that occur in the muscle so that the contraction of the antagonist muscle will be followed by relaxation of the agonist muscle (Kisner, 2016). (Haryoko, 2019)

Transcutaneous Electrical Nerve Stimulation (TENS) is the activation of sensory nerve fibers with non-pharmacological interventions that pass an electric current through the skin surface to relieve or control pain because TENS activates endogenous inhibitory mechanisms to reduce central excitability (Dailey et al., 2020).

Hold Relax Steartching Exercise Therapy can reduce spasms and facilitate muscle relaxation to increase the range of motion of joints / LGS from joints that experience limitations due to *Osteoarthritis* GENU (Khairurizal, 2019)

This case study concluded that osteoarthritis genu dextra occurred during the pain-free period. It is important to know that complaints of pain that occur in the quadriceps muscle are very high risk in the elderly, patients need physiotherapy to prevent very severe pain and immediately take physiotherapy action immediately.

Conclusion

Implementation of physiotherapy in patients with Osteoarthritis Genu Dextra at RSJD Dr. Arif Zainuddin Surakarta uses Ultrasond, TENS, and Hold rilex. Evaluation of Dextra Genu Osteoarthritis Cases with Ultrasond, TENS and Hild Rilex at RSJD Dr. Arif Zainuddin Surakarta is a patient with a diagnosis of osteoarthritis, male, 56 years old, who has been given physiotherapy treatment for two treatments from June 26 2023 to July 4 2023. The problems with physiotherapy found were pain, decreased knee muscle strength dextra, edema on the knee dextra and decreased functional activity. After being treated twice, the results showed that there was no increase in MMT in the knee flexor-extensor muscles, there was no decrease in tenderness, silent pain, and motion pain.

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