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Physiotherapy Management for Patients with Dextra Knee Osteoarthritis at RSJ Prof. Hospital. Dr. Soerojo Magelang

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Keywords:
Osteoarthritis, Infra-Red (IR), Transcutaneous Electrical Nerve Stimulation (TENS) Exercise Therapy (TL).

Abstract
Background: Osteoarthritis Knee Dextra is a degenerative joint disease in the form of damage to joint cartilage that develops slowly, the cause is unknown and the joint disease is more common than other joint diseases. Objective: To determine the implementation of Physiotherapy in reducing pain, increasing joint range of motion and increasing muscle strength in cases of Dextra Knee Osteoarthritis using Infra-Red (IR) Transcutaneous Electrical Nerve Stimulation (TENS) and exercise therapy (TL) modalities. Results: After undergoing therapy 6 times, pain assessment results were obtained for T1 silent pain: 1 becomes T6 : 1, tenderness T1 : 4 becomes T6 : 2, movement pain T1 : 4 becomes T6 : 3, increased joint range of motion S: T1 : S 0 – 0 – 125 becomes T6 : S 0 – 0 – 135 , increase in right knee muscle strength, hip flexor T1: 4- to T6: 4+, hip extensor T1: 4- becomes T6 : 4+. Conclusion: Infra-Red (IR) can reduce pain in the right knee in cases of Osteoarthritis Knee Dextra, exercise therapy Transcutaneous Electrical Nerve Stimulation (TENS) can reduce pain in the right knee in cases of Osteoarthritis Knee Dextra (TL), can increase the range of motion of the right knee joint in cases of Osteoarthritis Knee Dextra and can increase muscle strength in cases of Osteoarthritis Knee Dextra.

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1. INTRODUCTION

Background of the problem

Osteoarthritis (OA) is a degenerative joint disease in the form of damage to joint cartilage that develops slowly, has no known cause and is the most common joint disease compared to other joint diseases. In general, OA sufferers are over 50 years old. Men and women can both get OA, even at earlier ages

45 years old is more often found in men, but after the age of 45 years it is more common in women with a ratio of + 4:1 (Prasetya, 2002).

Osteoarthritis genu is a degenerative disease of the joints caused by several factors. This disease is characterized by damage to the cartilage (joint cartilage). Symptoms of genue osteoarthritis are progressive, where complaints occur slowly and over time will get worse (Helmi, 2012).

Osteoarthritis occurs because the joint repair process is unable to compensate for the damage that has occurred. Osteoarthritis can affect both men and women. Under the age of 45 years, OA attacks more men, and over 55 more women are affected (Sasongko, 2011).

From the aspect of physiotherapy, Osteoarthritis genue can cause various levels of disorders, namely impairments such as decreased muscle strength, limited range of motion of joints, pain, muscle spasms, and disabilities such as the inability to carry out certain activities, for example getting up from sitting, squatting, kneeling, standing for a long time. As a result of decreased movement ability. Even the level of functional limitation such as problems with walking, running and going up and down stairs (Fukuda, 2011).

Formulation of the problem

In written work scientifically, the formulation of the problem proposed in accordance with the problems that arise in right knee osteoarthritis is as follows:

1. Can Infra-Red (IR) reduce pain in the right knee?

2. Can exercise therapy increase the range of motion in the right knee joint (LGS)?
3. Can exercise therapy increase the strength of the quadricep muscles in the right knee joint?
4. Can exercise therapy improve functional activity abilities?

Writing purpose

In writing this scientific paper, the author has the following aims:

1. To determine the effect of Infra Red (IR) on reducing pain in sufferers of right knee osteoarthritis.
2. Knowing the effect of Hold Relax on increasing range of motion
3. joints (LGS).
4. Knowing the effect of Static by cycle on increasing the strength of the quadriceps muscles of the knee joint.
5. Knowing the effect of Exercise Therapy on increasing functional activity abilities.

2. LITERATURE REVIEW

Case Description

Osteoarthritis (OA) is a degenerative joint disease in the form of damage to joint cartilage that develops slowly, has no known cause and is the most common joint disease compared to other joint diseases. In general, OA sufferers are over 50 years old. Men and women can both be affected by OA, although before the age of 45 years it is more common in men, but after the age of 45 years it is more common in women with a ratio of + 4:1 (Prasetya, 2002).

Osteoarthritis genu is a degenerative disease of the joints caused by several factors. This disease is characterized by damage to the cartilage (joint cartilage). Symptoms of genue osteoarthritis are progressive, where complaints occur slowly and over time will get worse (Helmi, 2012).

Osteoarthritis occurs because the joint repair process is unable to compensate for the damage that has occurred. Osteoarthritis can affect both men and women. Under the age of 45 years, OA attacks more men, and over 55 more women are affected (Sasongko, 2011).

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Anatomy.

a. OS Femur

   Os Femur is the longest and heaviest bone in the body. The femur consists of a body, neck, proximal end and distal end. We differentiate the corpus into three parts, namely, anterior, lateral and medial facies (Evelyn, 2008).

b. OS Patella

   Os Patella is the largest sesamoid bone in the human body. Os patella shapedflat and triangular. The apex of the patella is facing distally. (Evelyn, 2008).

c. Os Tibia

   The tibial bone is divided into three parts, namely, the proximal end, the corpus and the distal end. The part of the tibiae bone that forms the genue joint is the proximal part. The proximal part consists of the medial condyle of the tibiae (Evelyn, 2008).

d. Os Fibula

   The fibula Os is small in shape and is located laterally and the fibula also consists of three parts, namely: the proximal epiphysis, diaphysis and distal epiphysis (Evelyn, 2008).

Etiology

There are various causes of osteoarthritis. Several risk factors for osteoarthritis include the following: age, gender, obesity, joint injuries (Soenarwo, 2011).

a. Age is the highest risk factor for osteoarthritis.
b. Obesity, under normal circumstances, body weight will pass through the medial knee joint and

will be offset by the lateral thigh muscles so that the resultant force will pass through the middle/central part of the knee joint. Meanwhile, in people who are obese, the resultant force will shift medially so that the force load received by the knee joint is unbalanced (Parjoto, 2002).

c. Physical activity that places a lot of stress on the knee joints will have a greater risk of developing OA (Parjoto, 2002).
d. Gender, there are more women than men (Parjoto, 2002).
e. Hormonal/metabolic factors, diabetes mellitus play a role in predisposing to the onset of OA. Although there is no clear evidence that hormonal factors are involved in causing OA

Pathology

In OA there are degeneration and inflammatory processes that occur in the connective tissue, cartilage layer, synovium, and subchondral bone. When the disease is active, one process can be dominant or several processes occur simultaneously at different levels of intensity.

a. Prone degeneration
b. Osteophytes
c. Subchondral Sclerosis
d. Synovitis

Clinical signs and symptoms

According to Parjoto (2000), if knee OA has manifested, the following signs and symptoms will improve: (1) pain, (2) limited joint scope (LGS), (3) quadriceps muscle weakness, (4) joint stiffness, is a symptom that is often found in OA, there is difficulty or stiffness in the joints when making movements, (6) deformity.

Infrared (IR) Physiotherapy Intervention Technology

Infrared is the emission of electromagnetic waves. Infrared has a frequency of 7 x 1014 – 400 x 1014 Hz and a wavelength of 700 – 15,000 nm (Wadsworth, 1983). The physiological effects arising from the administration of infrared are (1) increasing metabolic processes in the superficial layers of the skin so that the delivery of oxygen and nutrients to the tissue is improved, as well as the removal of combustion waste, (2) vasodilation of the capillaries and arterioles will occur immediately after radiation, (3) on sensory nerves, light heating has a sedative effect on sensory nerve endings, (4) on muscle tissue, an increase in temperature besides helping relaxation will also increase the ability of muscles to contract, (5) increase in body temperature.

Transcutaneous Electrical Nerve Stimulation (TENS)

Electrical stimulation given to nerve fibers will produce nerve impulses that travel in two directions along the axons of the nerves concerned. This event results in the release of P material from sensory neurons which leads to vasodilatation. (Jagmohan. S, 2005)

Exercise therapy

The general benefits of exercise therapy for those with OA of the knee joint include (1) increasing and maintaining LGS, (2) strengthening the muscles that move the knee joint, (3) increasing static and dynamic resistance, (4) increasing patient comfort, (5) reducing swelling. , (6) increasing the joint's ability to function better biomechanically and (7) increasing bone density (Lyn and Kisner, 2007).

a. Modified Hold Relax

   Hold Relax is a technique that uses contractions optimized isometrically (without movement) of the antagonist muscle group followed by relaxation of the muscle group (the principle of reciprocal inhibition by extending and increasing the LGS of the knee in the opposite direction to the muscle).

   The purpose of hold relax is (1) improving relaxation of antagonist patterns (2) improving mobilization, (3) reducing pain, (4) strengthening agonist movement patterns so that it can increase LGS (Kisner and Colby, 1996).

b. free active movement

This is an exercise that is done independently. Where movements originate from the muscles themselves which aim to increase tissue flexibility (Kisner, 2007).

c. Resisted active movement.

At this practice contraction occurs statically and dynamically with external resistance. The effects obtained from this exercise are also aimed at non-contractile tissues such as bones, tendons and ligaments where this exercise has the effect of maintaining tendon and ligament strength (Kisner, 2007)

3. PHYSIOTHERAPY PROCESS

1. Anamnesis
   a. General Anamnesis
      Name: Mr. Syamaun, Age: 52 years, Gender: Male, Religion: Islam, Occupation: Military Police, Address: Jln. Phyology Block B.6 Magelang, Registration Number: 06-03-000312 with a diagnosis of Osteoarthritis knee dexstra.
   b. Special Anamnesis
      - Main complaint
        The patient's main complaint is pain during activity.
      - History of Current Illness
        The history of the patient's current illness is that in 2014, approximately 2 weeks ago the patient felt pain in his knees, pain occurred in his knees after walking long distances and working too hard, then the doctor advised him to go to physiotherapy.

   c. System Anamnesis
      Head and neck: the patient does not complain of dizziness and neck stiffness Cardiovascular: the patient does not feel palpitations Respiration: the patient does not feel shortness of breath Gastrointestinal: smooth bowel movements Urogenital: controlled urination Musculoskeletal: there is pain in the left knee. Nervorum: does not feel tingling
2. Inspection
   a. Physical examination
      Blood pressure: 130/90, pulse: 68 x/minute, breathing: 22 x/minute, temperature: 36 C, height: 175 cm, weight: 84 kg.
   b. Inspection
      In this patient, statically the general condition of the patient is good, there is no visible deformity, while dynamically the patient looks limping when walking due to loss of the heel strike phase.
   c. Palpation
      local temperature is the same on the right and left, spasm in the quadriceps and hamstring on the left knee, and there is tenderness on the lateral side of the left knee.
   d. Basic movements
      - Active Movement
        Knee dexstra: Can move flexion-extension but not full ROM with pain with good coordination.
      - Passive Movement
        Knee dexstra: Can movef flexion-extension with full ROM there is normal pain and end feel.
      - Movement Against Prisoners
        The patient is able to resist resistance and is able to resist minimal resistance and there is pain on the lateral side of the left knee
   e. Inspection
      - VDS Pain Scale
        Silent pain: 4 (Pain is not that severe) Pressing pain: 6 (Severe pain)
        Movement pain: 5 (Quite severe pain)

- MMT
  Knee : dextra : 4 Knee : sinistra : 5
- LGS
  Knee dextra : S : 0o - 0o -100o Knee sinistra : S: 0o-0o-130o
- Anthropometrics
  5 cm Proximal Tuberosity of Tibia D:40 cm S:40 cm 10 cm Proximal Tuberosity of Tibia D:45 cm S:45cm 5 cm Distal Tuberosity of Tibia D:51cm S:51cm
- Posterior sliding drawer test (+) Anterior sliding drawer test (+)

  Crepitus (+) Hyperextension (+) Gravity sign (+)

f. Physiotherapy Diagnosis
   - Impairments
     There is quadricep and hamstring muscle spasm, pain, decreased muscle strength, limited LGS.
   - Functional Limitations
     There is interference with squatting activities
   - Disabilities
     The patient is not able to walk long distances while on duty.

g. Objective
   - Short-term
     Increases quadriceps and hamstring muscle strength and LGS knee and reduces knee pain and spasm in the quadriceps and hamstrings.
   - Long-term
     Increase functional activities as optimally as possible.

h. Education
   - Patients are advised to wear a knee brace.
   - It is recommended to do swimming or cycling.
   - Avoid activities that put stress on the knees.

i. Implementation of physiotherapy
   Tuesday December 2014
   - Infrared

     Preparing tools, checking cables and checking light bulbs. The patient's position is to sleep on his stomach in a comfortable position, the area to be treated is free from cloth, the light is perpendicular to the area being treated, set the distance between 45-60 cm for 10 minutes.
   - Transcutaneous Electrical Nerve Stimulation

     The position of the patient is lying on his back, the patient is in a comfortable position. The therapist's position next to the patient. Place electrodes on the lateral and medial sides of the left knee. Using current frequency: 200, duration: 50 with a time of 10-15 minutes. Then increase the intensity until you feel stimulation in the form of comfortable vibrations, then increase the intensity to the patient's tolerance limit.

   - Exercise Therapy
     - Active Resisted exercise

       The patient's position is sitting idly on the bed. The patient is instructed to straighten his legs, the therapist provides resistance. Do 8 counts with 4 repetitions.
     - Free active movement

       Prone or sitting position on the edge of the bed with the patient moving flexion and extension. The important thing is not to do it while supporting your body weight because this can cause further damage to the joint. Performed alternately 8 x 2 counts.

RESULTS AND DISCUSSION Results

1. Results of muscle strength evaluation with MMT Knee flexors: from T0 4 to T6 5 Knee extensors: from T0 4 to T6 5
2. The results of the evaluation of the degree of pain were measured by VDS. Silent pain: from T0 4 to T6 4
   Pressure pain: from T0 6 to T6 5 Movement pain: from T0 5 to T6 4
3. LGS evaluation with a goniometer
   Knee Dexstra: from T0 S: 0o-0o-100o to T6 S: 0o-0o-125o

DISCUSSION

1. Increased Dextra Knee Muscle Strength

   Providing exercise therapy in cases of osteoarthritis in the form of active movements and resistance aims to restore coordination, increase and maintain muscle strength in functional activities (Kisner, 2007).
2. Decreased Pain

   Physiological effects include therapy with infrared radiation which will produce a warming effect on superficial skin tissue resulting in vascular dilation which increases blood circulation in the area, the supply of oxygen and nutrients in the area also increases, thus causing a sedative effect and eliminating pain (Jagmohan, 2005).

   Electrical stimulation given to nerve fibers will produce nerve impulses that travel in two directions along the axon of the nerve in question, this event results in the release of P material leading to vasodilatation (Parjoto, 2006).
3. Improved LGS Knee Dextra

   Exercise therapy for osteoarthritis involves this movement active and resistance movement aims to train the muscles so that they relax and prevent movement limitations and maintain muscle elasticity (Kisner, 2007).

4. CONCLUSION

The patient with the name Mr. Syamaun, 52 years old with case of Osteoarthritis knee dexstra after carrying out physiotherapy with IR, TENS and Exercise Therapy modalities for 6 times, the following results were obtained:

1. There is a decrease in pain.
2. There is an increase in flexor and extensor muscle strength.
3. increased range of motion of joints.

IR, TENS, and exercise therapy by providing these three modalities have a great influence on the condition of osteoarthritis of the knee joint. Providing Infrared and Transcutaneous Electrical Nerve Stimulation can help prevent and treat problems in the form of reducing pain in the knee ranging from silent, pressing and movement pain, while exercise therapy can increase strength, reduce edema and restore the patient's functional activity to the maximum possible.

Suggestion

1. For Patients

   Patients are advised to be more careful in their activities especially those who use the knee joint a lot, patients are told to wear knee pads, especially during activities. If they feel pain, it is best to compress them with warm water. In addition to undergoing regular therapy, home exercises are also better in determining the patient's success and patience is also needed to get results. desired patient.
2. For Physiotherapists

   When providing services, it should be in accordance with existing procedures, can take advantage of advances in science and technology to increase knowledge that is appropriate to the patient's condition, and physiotherapists can choose intervention technology that is appropriate to the patient's condition.

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