

## **PHYSIOTHERAPY FOR ISCHIALGIA DEXTRA WITH MICRO WAVE DIATHERMY, TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION AND WILLIAM FLEXION EXERCISE**

**Hana Prasila Rini <sup>1</sup>, Andung Maheswara Rakasiwi <sup>2</sup>**

Pekalongan University

<sup>1</sup>thphanaprasilarini@gmail.com, <sup>2</sup>maheswaraandung@gmail.com

### **ABSTRACT**

Ischialgia is a manifestation of lower back pain due to the presence of ischiadicus clamping. Ischialgia is a radiating pain hypoesthesia-paraesthesia or disasthesia down along the course of the nerve root of Ischiadicus. The problem of physiotherapy in ischialgia is the presence of pain disorders, spasm, muscle strength, scope of joint motion, and impaired functional activity. In this case the intervention technology was chosen to overcome the above problems using the micro wave diathermy modality, transcutaneous electrical nerves stimulation and William Flexion Exercise. Purpose of this research is to prove that modalities can reduce pain, reduce spasm, improve LGS, increase muscle strength, and improve functional activity. The research used a case study design with descriptive analitic. Instrument research consisted of pain examination, spasm examination, examination of the scope of joint motion, examination of muscle strength, and examination of functional activity. Based on the therapy carried out 6 times the results showed that there were results (1) reduction in silent pain, tenderness, pain in motion. There are decrease in spasm in the erector spain muscle, M. Piriformis, M. Hamstring, the scope of joint motion increases, Increased muscle strength for functional activities. In cases of right ischialgia with modalities MWD, TENS and William Flexion Exercise can reduce pain, reduce muscle spasm, increase muscle strength, increase joint range of motion, and improve functional activity.

**Keywords: Ischialgia, MWD, TENS**

### **INTRODUCTION**

According to Suharto (2005), about 50-80% of the occupation in industrialized countries have experienced ischialgia, and 3000 men and 3500 women aged 20 years and over state that 51% of men and 57% of women complain of ischialgia. Epidemiological data regarding ischialgia in Indonesia do not yet exist, but it is estimated that 40% of the population of Central Java aged less than 65 years has suffered from ischialgia and the prevalence in men is 18.2% and in women 13.6, the prevalence of ischialgia symptoms is reported from various kinds. in the literature ranging from 1.6% in the general population to 43% in the working population, this symptom can last

for a year or more (Wilco et al, 2010). Low Back Pain (LBP) or low back pain is a clinical syndrome characterized by the main symptom of pain or other unpleasant feelings in the lower back (Sunarto, 2005). LBP is caused by various diseases and poor body activity (Hartiyah, 2008). The pain felt by LBP patients originates from the spinal cord (lower back), muscles and nerves around the area (Suma'mur, 2009). Ischialgia is one of the manifestations of low back pain due to the clamping of n. ischidicus. Ischialgia is pain that radiates (hypoesthesia-paraesthesia or dysasthesia) down along the course of the ischial nerve roots. Ischialgia itself is a symptom in which the patient feels pain in the leg that travels from the nerve root distal to the

ischial nerve to the lower leg. (Cailiet, 1981). Ischialgia is back pain that occurs due to clamping of the ischiadicus nerve (Rahim, 2012). Ischialgia of the ischial nerve which causes transfer of pain from the back to the lower leg in either one or both (Rahim, 2012). Causes of ischialgia include physical, chemical and electrical trauma, infections, metabolic and autoimmune problems. Ischialgia increases in frequency. Trauma and mechanical disturbances are the main causes of low back pain. People who do not do muscle work or have not done this activity for a long time can suffer from acute low back pain (Markam, 1997).

Signs and symptoms of Dextra Ischialgia include the presence of radiating pain, the limitations of motion in the trunk and hip joints are mainly for extension movements, laseque when doing footwork raised before reaching 70 mencepai is called a positive sign, patrik and Kontra patrik are sometimes painful, weakness of the trunk and hip muscles. Physiotherapy problems in right ischialgia include weakness in muscle strength, decreased range of motion and functional activity, muscle spasms can occur due to spontaneous reactions of a muscle due to pain protection, another potential reaction is that the patient tries to avoid movements that cause painful movements so that will interfere with the exercise or therapy process. If allowed to continue it will result in joint stiffness, muscle spasm, shortening of the muscles or atrophy and functional impairment of the legs (Mardiman dkk, 1993). Radiant pain is defined as an unpleasant feeling and is an emotional experience associated with both actual and potential tissue damage (Price et al., 2008). VAS Scale (Value Analog Scale) Is a tool to measure the degree of pain by showing the points on the pain scale line (0 - 10 cm), one end point is painless and the other end shows severe pain. The presence of pain in the trunk and hip area causes limited motion in the trunk and hip, so it is necessary to check the trunk and hip LGS using the midline and

goneometer. Goneometer & midline is a tool used to measure the extent of motion of the joints in degrees / cm (Clarkson, 2000). A decrease in the value of muscle strength occurs because the patient is reluctant to move the trunk and hip joints or from prolonged immobilization so that muscle strength decreases. Examination of the strength of the trunk and hip muscles is performed using MMT (Manual Muscle Testing). MMT is an attempt to determine a person's ability to contract a muscle or muscle group voluntarily (Luklukaningsih, 2009 ). To assess the patient's functional activity ability using the OSWESTRY index. With the scoring criteria number 1: no difficulty and 6: very difficult. The total value of examining functional disorders using the disability index from OSWESTRY uses the following calculations: The total value is divided by 50 times 100 (Hudaya, 1996).

Various approaches are used to manage pain lower back such as: physiotherapy, medical, use of toolsadaptation, acupuncture, and even surgery. Special There are various modalities of physiotherapy approach which consist of: (1)micro wave diathermy (MWD), (2) electrical stimulation; transcutaneous electrical nerves stimulation (TENS), interference (3) exercise therapy

(Kaplan et al, 1989). The best technology against physiotherapy there is currently no solution to the problem of low back pain understanding. Physiotherapy intervention in muscular lower back pain which is often used is exercise therapy. William flexion exercise is an active modality that has stretching techniques and techniques active reinforcement (Roland, 1999).

Based on this background the authors are interested in find out more about the benefits of giving tens, mwd and therapy exercise in the case of right ischialgia.

## RESEARCH METHOD

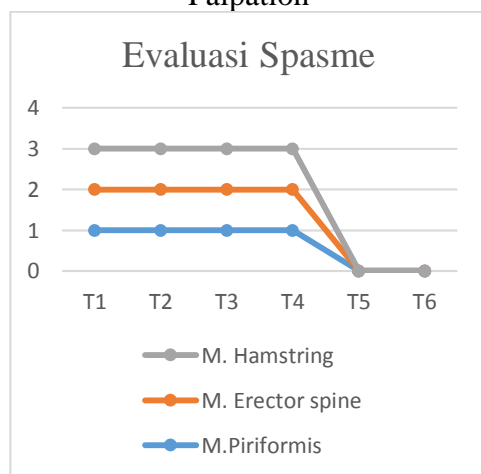
The research method used is descriptive analytic method, which is a method of examining the status of human groups, an object, a set of conditions, a system of thought or a class of events in the present. The research design used was a case study design (Notoatmojo, 2010). Analyze the data in a descriptive way and evaluate it to find out patient progress by analyzing the data, the therapist can determine the program subsequent therapy to achieve therapeutic goals, so that results can be obtained the end of the action that progressed from before the therapy. In this data collection method consists of primary data and secondary data, data primary, namely data obtained by the researcher directly from the patient, while the data secondary data taken from existing data (medical records).

## FINDINGS

### 1. Muscle Spasm

Muscle spasm by palpation is by pressing and holding the patient's body to determine the tension in the trunk and hip muscles. The assessment criteria are as follows. (0) = no spasm (1) = no spasm. (Mardiman dkk, 1993).

Graphic 1. Evaluation of Muscle Spasm by Palpation



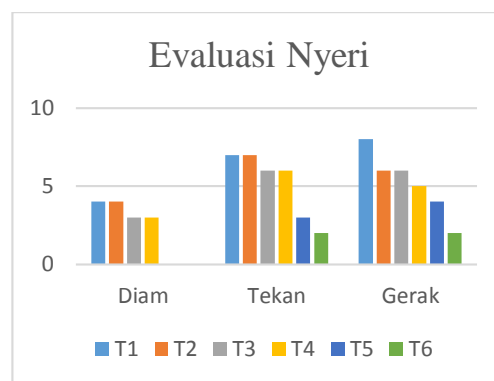
From graphic 1, the results of T1 to T6 in the spasm examination show that there is a reduction in spasm in M. Erector spinae,

M. Piriformis and M. Hamstring on the 6th therapy with T1 to T6 results in M. Erector spinae, M. Piriformis and M. Hamstring values 1 and T6 becomes 0.

### 2. Pain with VAS

The VAS scale (Visual Analog Scale) is a measuring tool for the degree of pain by showing points on the pain line (0-10 cm) one end point is painless and the other end shows unbearable pain (Wall and Melzack, 1999).

Graphic 2. Evaluation of Degree of Pain with VAS Scale (Visual Analog Scale).

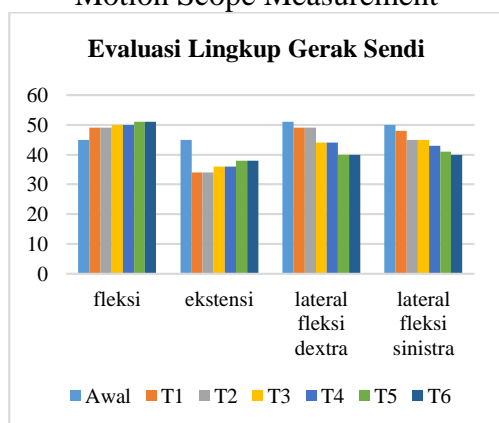


From graphic 2, it is found that there is a decrease in pain that spreads to a decrease in the pain scale, in silent pain.

### 3. Scope of Joint Motion with Midline & Goniometer

To evaluate the range of motion of the shoulder joint using the midline & goniometer, namely by measuring the extent of motion of the joint in degrees / cm.

Graphic 3. Evaluation Results of Joint Motion Scope Measurement

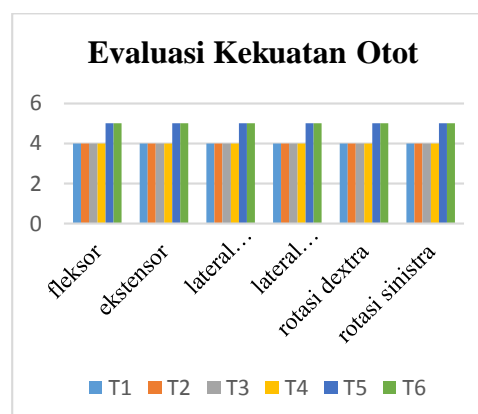


From graphic 3 above, the results of the increase in LGS from the spine obtained a value of 45 cm, in the flexion movement there is an increase in T1 = 4 cm, there is an increase in T6 = 6cm, in the extension movement the difference is obtained T1 = 11 cm there is an increase in T6 = 7 cm, in the right and left lateral flexion movements, the initial value was 51 cm, the right left lateral flexion movement obtained the difference between T1 = 2 cm, there was an increase in T6 = 11 cm, in the left lateral flexion the difference was T1 = 2 cm there is an increase at T6 = 10 cm, in the right rotation movement T1 = 40° there is an increase at T6 = 41°, in the left rotation movement the value T1 = 40° is an increase at T6 = 41°.

#### 4. Muscle Strength with MMT (Manual Muscle Testing)

Evaluation of the strength of the trunk and hip muscle groups using MMT (Manual Muscle Testing) (Luklukaningsih, 2009).

Graphic 4. Evaluation of Muscle Strength with MMT

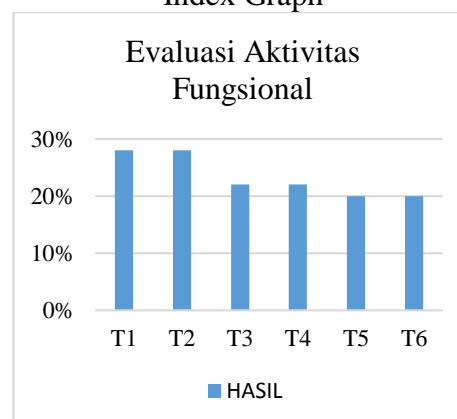


From graph 4 above, it is found that there is an increase in the strength of the 4-5 trunk flexor muscles, 4-5 trunk extensors, 4-5 right lateral flexors, 4-5 left lateral flexors, 3-4 right trunk rotators, 3 left trunk rotators. -4 and hip flexors 4-5, hip extensors 4-5, hip abductors 4-5, hip adductors 4-5, endorotators 4-5, exorotator 4-5.

#### 5. Functional Activity Capability with OSWESTRY Index

For the evaluation of functional activities carried out with the OSWESTRY index, the results showed that on all OSWESTRY scale items, the total score was 28% (moderate ability) to 20% (light ability).

Graphic 5. Evaluation of the OSWESRY Index Graph



From graph 5 above it can be concluded that an increase in functional activity was measured using the Oswestry index in the 3rd therapy when lifting heavy objects without pain, and an increase in the 4th therapy was able to walk regardless of the distance without pain and when I was able to sit on all types of chairs, while the increase in activity in the 5th therapy, namely I was able to stand as long as I wanted, in the increased activity in the 6th therapy when lifting heavy weights, from the first therapy to the sixth therapy, the results showed that in all the Oswestry scale item which previously had a total score of 28% which means moderate ability and at the sixth therapy it becomes 20% meaning mild ability.

## DISCUSSION

The William Flexion exercise is designed to reduce low back pain by strengthening the muscles that flex the lumbosacral spine, especially the abdominal muscles and gluteus maximus muscles and by relaxing the extensor muscle group of the lower waist (Basmajian, 1978). From the intervention that has been given, it has the effect of reducing pain, decreasing spasm, then increasing the range of motion of joints and muscle strength so that the patient's functional activity can increase from the presence of William flexion exercise from minimal to maximum movement. William Flexion exercise is an exercise technique that aims to correct posture, relax muscles, increase endurance, stretch and increase lordosis. The increase in muscle strength here is due to the William Flexion exercise which is carried out 6 times, from the movements the body does using the William Flexion exercise, it can increase muscles and provide relaxation to muscles that are experiencing tension then give increased endurance of the muscles from minimal to maximum (Williams, 2008). There is an increase in LGS in ischialgia patients due to exercise William Flexion exercise is to

correct posture, muscle relaxation, stretching makes muscle stretch and there is an increase in the range of motion of the joint.

The method for back pain has a component of the initial assessment for lumbar movement, followed by an intervention based on the results of the assessment. The goal of the movement that centralizes pain. The term centralization refers to a pattern of pain response in which one-way repetitive motion and a continuous posture produces sequential and resistant pain. The increase in LGS in ischialgia patients is due to the William Flexion exercise to correct posture, muscle relaxation, stretching which causes muscle stretching and an increase in the range of motion of the joints. 4-5 hip adduction. 4) Decreased muscle spasm of M. Erector spinae lumborum, M.piriformis and M. Hamstring from 1 to 0. 5) Increased joint range of motion (ADL).

The use of TENS showed a decrease in pain levels. The decrease in pain level is obtained because conventional TENS produces analgesic effects mainly through segmental mechanisms, namely by activating A- $\beta$  fibers which in turn will inhibit nociceptive neurons in the dorsal horn of the spinal cord. This refers to the gate control theory (Gate Control Theory) which states that the gate consists of inhibitory internal cells known as the substance gelatinosadan which are located in the posterior cornu and T cells which relay information from a higher center. The level of T cell activation is determined by the balance of intake of large-diameter A- $\alpha$  and A- $\beta$  fibers as well as small-diameter A- $\delta$  fibers and type fibers. The intake of small diameter fibers will activate T cells which will be felt as a complaint of pain. If the large diameter fibers are activated, it will activate T cells but at the same time the impulses also activate the substance gelatinos which results in decreased intake of T cells derived from

small diameter fibers in other words, the intake of large diameter fiber impulses will close the gate and inhibit 54 impulse transmissions. pain so that the pain is felt reduced or disappeared (Parjoto, 2006).

According to Singh 2012, the use of micro wave diathermy has a significant effect on reducing muscle spasm. MWD has several effects that help reduce problems in the problematic muscles, so that the use of MWD can be given in conditions of ischialgia. Muscle Relaxation is an effect resulting from the MWD intervention. When MWD is performed, it will be accompanied by stretching of the vertebral muscles. This will stimulate the golgi tendon of the organ so that muscle spasm is reduced and a relaxing effect can be achieved. In the condition of right ischialgia, the role of physiotherapy is very important in the problem of physical capacity and functional ability. After doing physiotherapy 6 times, there were changes including: 1) Decreased lumbar tenderness from 7 to 2 2) Increased range of motion in flexion movements has a difference of 6 cm, extension movements have a difference of 7 cm, left lateral motion is 3 cm difference , the right lateral movement has a difference of 1 cm, 3) Increased strength of the trunk flexors

## CONCLUSION

Ischialgia Dekstra needs to get proper and appropriate medical services included in physiotherapy which can play a role in reducing pain, increase the scope of joint motion (LGS), and increase functional activities patients with physiotherapy modalities, such as Micro Wave Diathermy, Transcutaneous Electrical Nerve Stimulation and William Flexion exercise. After doing therapy 6 times, there was a decrease in pain T1 silent pain (4), tenderness (7), motion pain (8), whereas in T6 silent pain(0), tenderness (2), motion pain (2). There is a decrease in spasm in the M. Erector spine, M. Piriformis, M. Hamstring where T1 = 1 no spasm and T6

= 0 does not exist spasm. There is an increase in the scope of motion of the trunk joint for all movements. There is an increase in the strength value of the 4-5 trunk flexor muscles, 4-5 trunk extensors, lateral flexor right 4-5, left lateral flexor 4-5, right trunk rotator 3-4, rotator trunk left 3-4 and hip flexors 4-5, hip extensors 4-5, hip abductors 4-5, adductor hip 4-5, endorotator 4-5, exorotator 4-5 (full ROM against gravity, against maximum resistance). There is an increase in the functional activity of T1 = 28% there is a change in T4 = 20% the result of moderate dependence.

## REFERENCES

- Cailliet, R., 1981; *Low Back Syndrome*; Second Edition, F.A Davis Company, Philadelphia
- Clarkson, Hazed M, 2000; *Musculoskeletal Assesment joint Rnge of Motion and Muscle Streght*, Second Edition, Lippincott Williams & Wilkins, Maryland, hal.102, 109-121
- Hasibuan. Junianto, P. 2007. *Tanda dan gejala penyebab ischialgia*
- Hudaya Prastya, 2002 ; Politeknik Kesehatan Surakarta Jurusan Fisioterapi , Surakarta
- Athletes*, Journal of Intercollegiate Sport, 2, 260268)
- Kuntono, H. P., 2008. *Aspek Fisioterapi Syndroma Nyeri bahu dalam Kupas Tuntas Frozen Shoulder*, Surabaya.
- Luklukaningsis Zuyina, 2009, *Sinopsis Fisioterapi untuk Terapi Latihan*, Penerbit Mitra Cendekia Yogyakarta, Yogyakarta.
- Mardiman, Sri, dkk, 1994; *Dokumentasi Persiapan Praktek Profesional Profesi (DPPPFT): Akademi Fisioterapi Surakarta Depkes*; Surakarta, hal. 8-35
- Markam S.1997.*Neorologi*.Jakarta :Pt, EGC

- Price Sylvia A, Willson dan Lorraine M, 2005; *Patofisiologi*, Edisi 6, Penerbit EGC, Jakarta. Hal. 1063.
- Rahim, H.A. 2012. *Vertebra*. Jakarta: Sagung Seto
- Suharto, 2005. Penatalaksanaan Fisioterapi pada Nyeri Pinggang bawah Aspesifik Akibat Joint Block Thorakal dan lumbal, dalam: *Cerminan Dunia Kedokteran* No. 146. Pp: 152-54
- Suma'mur, P. K. (2009). *Higiene perusahaan dan kesehatan kerja*. Jakarta: sagung Seto
- Wall Patrick D. Melzack Ronald. 1999. *Text Book of Pain*, Fourth Edition. Elsevier, Chulchill Livingstone. USA.
- Wilco C., 2010. Surgerry versus conservative management of sciatica due to a lumbar herniated disc: a systematic review. Department of Neurosurgery, Leiden University MedicalCenter