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Physiotherapy Management Condition of Low Back Pain Lumbar Spondylosis Using Transcutaneous Electrical Nerve Stimulation and William Flexion Exercise Modalities at Pku Muhammadiyah Gamping Hospital

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Abstrak
Low Back Pain is pain that is felt in the lower back region, can be a local pain, and radicular pain or both. Pain originating from the lower back can refer to other regions or otherwise derived from other areas in the felt in the lower back area, then do a treatment of physiotherapy by using modalities of physiotherapy in the form Transcutaneus Electrical Nerve Stimulation (TENS), Short Wave Diathermy (SWD), and William's Flexion therapy. Objective: To investigate the implementation of physiotherapy in reducing pain, increasing range of motion (LGS), and reduction of muscle spasm in conditions of Low Back Pain. Therapy: modalities used in the case of Low Back Pain are Transcutaneous Electrical Nerve Stimulation (TENS), Short Wave Diathermy (SWD), and William's Flexion Exercise Therapy. Results: The results obtained after the conducted therapy 6 times with modalities SWD, TENS, and Therapeutic Exercise William's Flexion are as follows: pain silent T1 = 0 mm to T6 = 0 mm, tenderness T1 = 60 mm to T6 = 30 mm , pain motion T1 = 20 mm to T6 = 0 mm, LGS Trunk Flexion T1 = 6 cm into T6 = 7 cm, LGS extension Trunk T1 = 2 cm into T6 = 2 cm, muscle spasm Paravertebra T1 = 2 to T6 = 0. Conclusion: SWD, TENS, and William's Flexion Exercise therapy can reduce motion tenderness and pain, improve LGS, and reduce muscle spasm in conditions of Low Back Pain.

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1. INTRODUCTION

A. Background of the problem

Low Back Pain is pain felt in the lower back area, it can be local pain, radicular pain or both. Pain originating from the lower back can be referred to other areas or vice versa, originating from other areas can be felt in the lower back area (Meliala et al, 2005).

In the United States, mechanical low back pain is the most common patient complaint submitted to doctors, approximately 60-80% of the adult population is affected, so Low Back Pain is ranked 4th in the number of patient complaints in outpatient clinics. Judging from the costs incurred, low back pain is ranked 3rd most expensive after cancer and heart disease. Complaints of Low Back Pain most often cause lost days of work (Soedomo, 2002).

Low Back Pain is a problem that is often encountered and affects approximately 60 – 80% of the population at some point during their lives. Of all cases, only 20-30% of cases are found to have anatomical abnormalities. Meanwhile, the remaining 70-80% have no known cause (idiopathic) (Yanuar, 2002). But lower back pain can be caused by strains of the vertebral muscles, HNP, spondylosis, spondylolysis,

Myogenic, vertebral tumors, infections. Physiotherapy in this case plays a role in restoring and overcoming impairment and activity limitation disorders so that patients can return to their activities. To overcome this problem, physiotherapy modalities such as Transcutaneous Electrical Nerve Stimulation (TENS), Short Wave Diathermy (SWD) can be used, which is a physiotherapy modality chosen by the author in cases of low back pain due to

Myogenics is discussed in this Scientific Writing proposal. Another modality used by the author for Low Back Pain cases is William's Flexion exercise therapy. The benefits of therapy for Low Back Pain patients are increasing joint range of motion (LGS), patient comfort, reducing spasm, increasing the joint's ability to function better biomechanically (Basmajian, 2003).

B. Formulation of the problem

1. Can Short Wave Diathermy (SWD), Transcutaneous Electrical Nerve Stimulation (TENS), and William's Flexion therapy reduce pain and improve LGS?

C. Writing purpose

To determine the effect of Short-Wave Diathermy (SWD), Transcutaneous Electrical Nerve Stimulation (TENS), and William's Flexion therapy on reducing pain and increasing LGS in cases of Low Back Pain.

D. The benefits of writing

1. For Writing

Increase and expand knowledge about Low Back Pain cases and forms of therapy. Adding information to physiotherapy in particular and to health workers in general, about the effect of giving Short Wave Diathermy (SWD), Transcutaneous Electrical Nerve Stimulation (TENS) and exercise therapy in cases of Low Back Pain.

2. For Hospitals

Useful as a method of physiotherapy services that can be applied to patients with cases of Low Back Pain so that they can be treated optimally.

3. For Readers

Providing information and knowledge about Low Back Pain and its physiotherapy management.

2. LITERATURE REVIEW

A. Definition

Low Back Pain is an unpleasant sensory and emotional experience in the area between the 12th thoracic vertebra to the bottom of the hip. Those that arise due to potential damage or tissue damage include: blood vessel dermis, muscle fascia, tendons, cartilage, ligament bones, intra-articular meniscus, bursa (Paliyama, 2005)

Low back pain is related to stress/strain of the back muscles, tendons, ligaments which usually occurs when doing excessive daily activities. The pain is dull, varies in intensity, often becomes chronic, can be localized or can spread around the glutea. This pain is not accompanied by hypertension, paresthesia, weakness or neurological deficits. If a cough or sneeze does not spread to the legs (Paliyama, 2005).

B. Anatomy Physiology

1. Lumbar vertebral structure

The lumbar vertebrae are composed of 5 vertebrae that joint with each other which play an important role in carrying out their function of supporting the body and means of movement. The general arrangement of vertebral bones consists of the corpus, arch, and vertebral foramen.

2. Intervertebral disc
   a) The inner part, called the nucleus pulposus, is a gelatinous material with strong water-binding properties because it contains 88% water.
   b) The edge is called the annulus fibrosus which consists of collagen fibers arranged in concentrations and fibrocartilage which differs in description from the nucleus pulposus (Platzer, 1992). It is an elastic structure between the vertebral bodies. The inner disc structure is called the nucleus pulposus, while the peripheral part is called the annulus fibrosus. The disc functions as a joint cushion between adjacent bodies 12 as a shock breaker at various pressures in supporting body weight (Kapandji, 1990).
3. Stability

   There are two types of stability in the vertebrae, namely passive stabilization and active stabilization.

   For passive stabilization is a ligament consisting of:
   a) The anterior longitudinal ligament is attached to the anterior part of each disc and anterior to the vertebral body, this ligament controls extension movements.
   b) the posterior longitudinal ligament which extends and attaches to the posterior part of the disc and posterior to the vertebral body. This ligament functions to control flexion movements.
   c) The ligament flavum is located on the dorsal vertebra between the laminae which functions to protect the spinal cord from the posterior.
   d) The transfer ligament is attached to each transverse process which functions to control flexion movements. Meanwhile, those that function for active stabilization are the muscles that function for lumbar movement which are located anteriorly, laterally and posteriorly. The anterior and lateral muscles include: m. rectus abdominis, m. internal oblique, m. psoas major, and m. quadratus lumborum. Posterior muscles include: m. longissimus thorakalis, m. iliocostalis.
4. Biomechanics of the lumbar spine

   Movements that occur in the lumbar vertebrae are:
   a. Flexion movement

      Measurement of joint range of motion is carried out using the mid line. The data taken in this measurement is the range of motion of the joints in the vertebrae. This measurement is carried out with the patient standing, then the therapist places the mid line with the benchmarks Vc7 and Vs1 for flexion-extension movements. The patient is asked to perform flexion-extension movements and the difference between the measurements in position is measured normal. In normal people, the difference between the normal position and the flexion or extension position is on average around 10cm or 4 inches.
   b. Lateral flexion movement

      With the moving muscle m. internal oblique abdominis, m. rectusabdominis. For lateral flexion movements, measurements are made by placing the mid line on the middle finger, then measuring the normal distance (when standing upright) from the middle finger to the floor. After that, the patient is asked to perform lateral flexion movements right and left, measure the distance from the middle finger to the floor, whether there is a striking difference between right and left. If there is a striking difference between the right and left, it means there is a limited range of motion (LGS) on one side.
5. Etiology

a. Changes in body posture are usually due to primary and secondary trauma.
b. Primary trauma such as: Spontaneous trauma, for example an accident.
c. Secondary trauma such as: HNP, osteoporosis, spondylitis, spinal stenosis, spondylitis, osteoarthritis.
d. lumbosacral ligament instability and muscle weakness.

6. Pathology

The waist is the back part of the body that supports the body from the thorax upwards and the abdomen. This part is the lumbar spine in particular and the entire spine in general. Each vertebra along with the intervertebral discs along the vertebral column is an anatomical and physiological unit. (Kisner, Carolyn, 2009)

The front part which consists of the vertebral body and intervertebral discs functions as a strong carrier, but is quite flexible and can withstand pressure along its axis. What resists this pressure is the nucleus pulposus.

Flexibility is guaranteed by strong ligaments and fascia that bind and wrap the bodies and intervertebral discs. However, this flexibility is guaranteed against excessive backward and lateral bending by the posterior superior articulus which is the back of each vertebra. The back consists of the pedicle, lamina and spinous and transverse processes. (Kisner, Carolyn, 2009) In its entirety the back provides a tunnel known as the vertebral canal. And the inferior articular facies articulate with the neighboring articular facies. These joints consist of all the tissue elements that each joint has normal body, namely cartilage, synovial and capsule (Kisner, Carolyn, 2009)

CASE STUDY IMPLEMENTATION PLAN

A. Physiotherapy Diagnosis

Problems faced in cases of lower back pain include:

1. Impairments

Impairment consists of (1) tenderness and movement pain in the lower back, (2) there is spasm of the L4-L5 paravertebral muscles, (3) there is limited trunk flexion.

2. Functional Limitations

Functional limitation in the form of patients having difficulty carrying out functional activities, especially when praying, standing for a long time, walking long distances, bending and sitting for a long time.

3. Participation Restrictions

Participation Restriction in the form of the patient still being able to participate in all activities around his home environment well but accompanied by pain in the lower back.

B. Implementation of Physiotherapy

The modalities used in cases of Low Back Pain are Short Wave Dhiatermy (SWD), Transcutaneous Electrical Nerve Stimulation (TENS) and exercise therapy in the form of William's Flexion Exercise.

1. Transcutaneous Electrical Nerve Stimulation (TENS) (Kapandji, IA, 2009)
   a. Tools preparation

      Make sure the machine is in good condition. Prepare electrodes of the same size and the electrodes are quite wet. You must also pay attention to cable installation, method of installation and placement of electrodes as well as selecting frequency, pulse duration, time duration and intensity.

   b. Patient preparation

      Position the patient to sleep on his back. Give the patient an explanation

about the therapy that will be carried out including the name of the therapy, the reason for giving the therapy, the expected feeling during the therapy and the effects of the therapy.

c. Implementation of therapy

Place the electrode on the pain point, then the therapist adjusts the intensity according to the patient's tolerance. The therapist always monitors the patient during therapy. If you no longer feel the current, then the intensity must be increased. After the therapy is complete, reduce the intensity and turn off the machine. Remove the electrodes, check the treated area for redness as a sign of irritability, then tidy up and store the TENS unit after use.

2. Short Wave Diathermy (SWD) (Kuntono, Heru Purbo, 2000)

a. tools preparation

Make sure the machine is in good condition, check that the cables and electrode limbs are in good condition. Before using the machine, you must first check whether it is functioning properly by using a light bulb attached to the electrode limb. If the SWD is in good condition and all components are installed properly then the SWD is ready to be used.

b. Patient preparation

Position the patient to sleep on his stomach. Give the patient an explanation about the therapy that will be carried out including the name of the therapy, the reason for giving the therapy, the expected feeling during the therapy and the effects of the therapy.

c. Implementation of therapy

Place the electrode on the area that feels painful, then set the therapy time for 15 minutes. After that, the therapist adjusts the intensity according to the patient's tolerance. The therapist must always control the patient's condition whether the intensity felt by the patient is too hot or not felt at all. After the therapy is complete, reduce the intensity and remove the electrode, check the area being treated, whether there is a reddish color as a sign of irritability, then tidy up and store the SWD unit after use.

3. William's Flexion Exercise (Priyatna, H, 2000)

a. Patient preparation

Position the patient to sleep on his stomach. Give the patient an explanation about the therapy that will be carried out including the name of the therapy, the reason for giving the therapy, the expected feeling during the therapy and the effects of the therapy.

b. Implementation of Therapy

1) Starting position. The patient sleeps on his back on a comfortable but somewhat hard mattress. Both knees are bent and both feet are flat on the surface of the mat. Flatten your waist by pressing your waist down against the mat by contracting your abdominal and buttock muscles. Every 5 seconds then limp. Repeat this exercise 10 times. Make sure that when you are limp, your waist remains flat. To be sure, place your hands below the middle of your waist.
2) The starting position is the same as position 1. Contract your abdominal muscles and flex your head so that your chin touches your chest and your shoulders are lifted until they come off the mat, then hold for 5 seconds and continue to relax. Do this exercise 10-25 times. Don't do sitting up.

3) The starting position is the same as position 1. Flex one knee towards your chest as far as possible, then both hands reach your hamstrings and pull your knee towards your chest. At the same time, lift your head so that your chin touches your chest and your shoulders are off the mat, and hold for 5 seconds. The exercise is repeated with the other leg. Do it 10 times, don't do it with both legs straight up, because it aggravates the waist problem.
4) The starting position is the same as position 1. This exercise is the same as number 3 but with both knees bent, raised upwards and pulled with both hands towards the chest. Raise your head and shoulders off the mat. Exercise is repeated 10 times. Warning: when you raise both legs up as far as possible, then pull them up with both hands towards your chest.
5) The patient's position is that one leg is straight behind, the other leg is bent forward, both arms are straight on the mattress and support the back straight forward. Move your back down so that your chest is against your thighs several times. After that, move the pelvic up and down, together with the waist several times. Then alternate with the other leg. Movement is repeated 10 times.
6) Exercise in position 5. The patient stands with his back against the wall. Both feet are at 10-15 cm from the wall. Flatten the back against the wall by keeping the patient's back flat and walking away from the wall. Hold your back flat for 10 seconds, then increase the time you hold your back flat with as much strength as possible.
7) The patient stands with his back slightly bent, his arms straight down and slightly forward, his legs slightly flexed at the knees. Then the patient, with both hands and feet still in place, sits in a squat and both hands touch the mat, then stands up again. This exercise is repeated 10 times.

3. DISCUSSION

Patients with a diagnosis of Low Back Pain based on the examination results show pain and a decrease in LGS. After receiving physiotherapy treatment for 6 times, the results were reduced pain, decreased muscle spasm, and increased LGS. Mechanism of reducing pain, increasing LGS, and muscle spasm:

1. Decreased Pain

There was a reduction in pain during 6 therapy sessions. This means that giving Short Wave Diathermy for 15 minutes can reduce the pain felt due to the heat effect produced by Short Wave Diathermy which affects the circulation of pain. The physiological effects produced by Short Wave Diathermy will increase temperature, increase metabolic processes, smooth or increase capillary blood flow, so that pain can be reduced. Reducing pain with the application of TENS means a direct influence occurs at the cellular level, where the current causes excitation of peripheral nerve cells, then indirectly affects the system level which is indicated by the release of endogenous analgesic substances such as endorphins, enkephalins and serotonin (Parjoto, 2006).

Exercise therapy also has an effect on reducing pain. For example, in exercise therapy with William's Flexion Exercise, to reduce pain, provide lower trunk stability through active development of the abdominal muscles, gluteus maximus, and hamstrings, to increase flexibility / elasticity in the hip flexor and lower back (Sacro spinalis) muscle groups, as well as to restore / perfect the working balance between the flexor & extensor postural muscle groups (Sugijanto, 2015)

2. Increase in Joint Range of Motion (LGS) Based on the graph above, there is also an increase in the Joint Range of Motion. This means that providing exercise therapy such as the William flexion exercise can reduce pain, reduce muscle spasms, increase tissue elasticity so that the range of motion of the joints increases (Sidharta, P 2015).

4. CONCLUSIONS AND SUGGESTIONS

A. Conclusion

After carrying out physiotherapy procedures 6 times on a patient named Mr S, aged 59 years with a medical diagnosis of Low Back Pain, the results were obtained:

- There is a reduction in back pain by using Short Wave Diathermy (SWD), Transcutaneous Electrical Nerve Stimulation (TENS) modalities.
- There is an increase in the range of motion of the trunk joints using the William's Flexion Exercise therapy modality.

B. Suggestion

Low back pain sufferers due to trauma with existing physical capacity and functional abilities are still faced with meeting the needs of daily living so they need help with the problems they face. To obtain optimal therapeutic results, good cooperation is needed between sufferers and therapists as well as the related media team so that it is possible to obtain maximum results. In this condition, it is necessary to give advice to sufferers who experience it

1. routinely do the exercises that have been taught by the therapist, namely the William Flexi method,
2. always wear a corset when doing activities to provide stability to the vertebrae,
3. Avoid excessive stress on the lumbar vertebrae, for example by lifting or moving objects correctly, such as the lifting techniques that have been taught,
4. carrying out therapy routinely and regularly where 6x treatment is not enough to obtain maximum results,
5. always check with the doctor to determine the level of healing,
6. The patient is advised to do sit ups, back ups

5. BIBLIOGRAPHY

Basmajian, John U, 2005 ; Therapeutic Excercise; Third Edition, Rehabilitation mendian, Jakarta.

Kapandji, I. A., 2009; The Physiologi of Joints; Volume three, Churchill Livingstone, USA. Kisner, Carolyn, 2009 ; Therapeutik Exercise Foundations and Techniques ; Third Edition, F. A.
Davis Company, Philadelphia

Kuntono, Heru Purbo, 2000; Penatalaksanaan Elektro Terapi pada Low Back Pain; Kumpulan Makalah TITAFI XV; Semarang 2-4 Oktober 2000, IFI

Meliala, 2005; Tata Pemeriksaan Klinis Dalam Neurologi; Dian Rakyat, Jakarta.

Paliyama, 2002; Perbedaan Pemberian Back Isometrik dan Back Isotonik pada Kasus Low Back Pain Akibat Lumbo Sacral Strain Ditinjau dari Kemampuan Aktivitas Sehari-hari, Semarang

Parjoto, 2006; sumber Fisis; Poiteknik Kesehatan Surakarta; Surakarta.

Platzer, Warner, (2004). Atlas dan Buku Teks Anatomi Manusia. Penerbit Buku Kedokteran EGC.

Priyatna, Heri, 2000; Perbedaan Pemberian Back Isometrik dan Back Isotonik pada Kasus Low Back Pain Akibat Lumbo Sacral Strain Ditinjau dari Kemampuan

Aktivitas Sehari-hari; Kumpulan Makalah TITAFI XV ; Semarang IFI.

Sidharta, Priguna, 2015; Tata Pemeriksaan Klinis Dalam Neurologi; Dian Rakyat, Jakarta

Soedomo. 2002. Pengembangan Tehnik Terapi Nyeri Dengan Modalitas Thermal ;disampaikan pada Pelatihan Penatalaksanaan Fisioterapi Komprehensif pada Nyeri, Surakarta, 7-10 Maret 2002.

Sugijanto, 2015; Manual Terapi pada Keluhan Nyeri Punggung Bawah Non Spesifik; Kumpulan Makalah TITAFI VIII; Bandung, IFI.