

Case Report: the Provision of Intervention TENS and Neuro Mobilization in Patients with Cervical Root Syndrome (CRS)

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Abstract

The purpose of this article is to show the benefits of physiotherapy modalities in the form of *Trancutaneous Electrical Nerve Stimulation* (TENS) and Neuro Mobilization in patients with Cervical Root Syndrome (CRS). It begins with the presence of activity will cause excessive effect on a person, such as a complaint on the muscular system (*musculoskeletal*) in the form of complaints of pain, pain, fatigue and other. This research using this type of research is a case study. The implementation of the research made in In RSUP Dr. Sardjito. After getting physiotherapy treatment for 3 times using TENS and Neuro Mobilization obtained positive results such as a decrease in pain silent, press, and motion, the presence of reelkatan LGS, and increased activity. In addition, it was found that the presence of a decrease in pain in cervical, i.e. there is the addition of ROM on some field of motion. Another thing is there is a drop points NDI which signifies that the patient is gradually able to release its dependence with other people in the activity diary.

Keywords : TENS, Neuro Mobilization, Cervical Root Syndrome (CRS)

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Introduction

Human do a variety of activities to meet their needs, whether it is the need of physical, mental, spiritual and social work, sports, beraktivibags social, worship, and other-other. Activity will cause excessive effect on a person, such as a complaint on the muscular system (*musculoskeletal*) in the form of pain complaint of pain, stiffness, and other (Haryatno and Kuntono, 2016). *Cervical Root Syndrome* (CRS) is a condition caused by irritation of the the emphasis of the nerve roots servical by the protrusion of the *discus intervertebralis*, the symptoms are neck pain that spreads to the shoulders, the upper arm or the forearm, and weakness or spasm of the muscles.

Cervical Root Syndrome (CRS) appear most often the result of degenerative changes that occur in the spine. CRS can be caused by compression of the nerve root *cervical*. Compression can occur as a result of disc herniation, *spondylosis*, the instability of the structure of the *cervical*, trauma, or tumor. The CRS is a disorder of the nerve roots such as disk herniation, *spondylosis*, or *cervical osteophytes* are accompanied by complaints of pain, numbness, tingling, weakness of the upper extremities and often result in functional limitations (Sarfranzawaz et al., 2015).

The prominence of the section *discus* this then the surrounding tissues, namely *corpus-corporis vertebrae* adjacent will be a change. The combination between the depletion of discus that causes narrowing of the outdoor discus and the onset of osteophytes will narrow the diameter of the spinal cord. Neck pain, also known as pain in cervical, pain nape of the neck or *cervical syndrome* is a complaint that is often encountered in clinical practice. Every year at 16.6% of the adult population complains of a bad taste in the neck, even the 0.6% continued to be neck pain that weight. The incidence of neck pain increases with age (Prestige, Winaya & Silakarma, 2014).

Neck pain results in a person experiencing a decrease in productivity of work and interfere with daily activities (Fatmawati, 2013). *Cervical Root Syndrome* is a collection of symptoms which is very annoying activity of the patient so that proper handling can be diberiakan bias specialized handling non opratif and if the complaint was the weight of the surgery may be done to rehabilitate the patient's condition (Eubanks, 2010). A riset by (Dewi, 2015) states that after the therapy to the patient , *cervical root syndrome* of the results obtained in the form of: a decrease in pain, increase in LGS, and adanya decrease muscle spasm.

From the background of the problem above, the researcher wants to know the benefits of physiotherapy modalities in the form of *Trancutaneous Electrical Nerve Stimulation* (TENS) and Neuro Mobilization to reduce pain, increase the Scope of Joint Motion (LGS) and increases the functional activity of the patient's Cervical Root Syndrome (CRS).

Methods

Penelitian using this type of research is a case study. The implementation of the research carried out in Dr. Sardjito general HOSPITAL on a patient named Mr. A 32-year-old religious Islam and worked as a farmer.

Results

A patient named Mr. A 32-year-old experiencing a sense of nyeri menpotatoes from the neck up to the right hand up to finger 3,4, 5. Based on the complaint then do physiotherapy Transcutaneous Electrical Nerve Stimulation (TENS) and Neuro Mobilization. As for the history of the disease now that the patient comes to the poly physiotherapy adult RSUP Dr. Sardjito Yogyakarta on Tuesday (27/04/2021) complained of pain radiating from the neck to the fingers 3,4,5 right hand already since 1 years. Pain is felt very heavy when the patient raised his hands to the top. The patient has no history of falls or injury that can trigger issues currently experienced. The patient has no history of concomitant diseases, and the patient did not have a history of family illness.

Table 1. Anamnesis System

System	Description
the Head and Neck	There are complaints of pain in the neck
Cardiovascular	No complaints of chest pain and palpitations
Respiration	No complaints of shortness of breath and cough
Gastrointestinalis	No complaints of nausea, vomiting and CHAPTERS controlled
Urogenital	BATH controlled
Muskuloskeletal	the Patient complained of a stiff neck or spasm of the M. Trapezius
Nervorum	Patients feel pain from the neck of the back, shoulder, arm until the fingers right

Based on the anamnesis the system mentioned that the patient had complaints on the neck but no complaints on the chest. Patients experiencing neck that is rigid or spasm of the M. Trapezius. So the patients feel the pain from the neck of the back, shoulder, sleeveen until the finger on the right.

Table 2. Vital signs

Blood pressure	: 120/80 mmhg
Pulse Rate	: 62 x / minute
Respiratory	: 24 x / minute
Temperature	: 35,9°C
Height	: 162 cm
Weight	: 58 kg

Vital signs daripasien the obtained results are normal. Inspection static i.e. the patient is not using a *neck collar*, *forward head posture*, and no injury. As for the inspection dynamically i.e. pasien walking without aids, phalang 3,4,5 dextra stiff and restricted movement.

Table 3. Examination Of The Basic Movements

Movement type	Description
active Motion	<ul style="list-style-type: none"> - Wrist dextra : Dorsal flexion and palmar flexion is not full ROM + Pain - Phalang dextra : Flexion not full ROM + pain
passive Motion	<ul style="list-style-type: none"> - Wrist dextra : Dorsal flexion and palmar flexion of the full ROM + pain - Phalang dextra : flexion of the full rom + pain
Motion isometric against prisoners	<ul style="list-style-type: none"> - Wrist dextra : dorsal flexion and palmar flexion able to fight the prisoners + pain - Phalang dextra : Flexion able to fight against prisoners of + pain

Examination of the basis of the type driven by the patients themselves or be driven by terapist can be limitations because of the pain so that the patient is difficult to move freely.

Table 4. Examination of the functional ability using the *Neck Disability Index*

No	Category	Value
1	Level of pain	2
2	Treatment inri	2
3	Mengangkat	2
4	Read	0
5	headache	0
6	Concentration	0
To	Work	1
7		
8	Drive	2
9	Bedroom	1
10	Rec	2
Total:		12

$$\begin{aligned}
 &\text{The value of the patient : 12} \\
 \text{Number:} &= 10 \times 5 = 50 \\
 &= 12/50 \times 100 \\
 &= 24\% \text{ (category currently)}
 \end{aligned}$$

Cognitively the patient is in good condition. Pasien can tell the condition and answer all the questions given by the physiotherapist. As for the intra-personal pasien

have the spirit of cured with therapy 1 week time. Then for the state of interpersonal patients, namely kir and the environment to give support against the patient's recovery. Most cases of radiculopathy cervical can heal itself and can be managed conservatively in the absence of symptoms of progressive neurological or other symptoms related (Iyer & Kim, 2016).

Discussion

Intervention TENS and Neuro Mobilization in Patients with CRS (Cervical Root Syndrome)

The granting of TENS in the case of cervical root syndrome aims to reduce the pain through the mechanism of segmental. TENS will produce the effect of analgesia with a way to activate the fibers A beta that will inhibit the neurons nosiseptif in cornu attractive of the spinal cord, which refers to the theory of gate control (Gate Control Theory). Therapy with the use of Trancutaneous Electrical Nerve Stimulation (TENS) modalities that can generate an electric current with a low frequency that is used to generate muscle contraction or modifications implus pain through the effects of the sensory nerves. Stimulation on sensory nerve fibers bermylein thickness will produce the effect. inhibition or blocking of the activity of the nerve fibers bermylein thin or not bermylein that carry the pain impulses, so that the information is pain not to the central nervous system. In conjunction with the modulation mechanism consists of his of the mechanism of periperhal, the mechanism of segmental, and the mechanism of extra-segmental (Nugroho, 2017).

Table 5. The results of the evaluation of granting intervention

T1 (27/04/2021)	Pain VAS 6/10 Spasm of the muscles of the upper trapezius ROM Dorsal and palmar flexion of the wrist dextra as well as flexion of the phalang dextra limited
T2 (04/05/2021)	Pain VAS 6/10 Spasm of the muscles of the upper trapezius ROM Dorsal and palmar flexion of the wrist dextra as well as flexion of the phalang dextra limited
T3 (11/05/2021)	Pain VAS 4/10 Spasm of the muscles of the upper trapezius reduced ROM of the Dorsal and palmar flexion of the wrist dextra as well as flexion of the phalang dextra not limited

Cervical root syndrome is a condition caused by irritation or compression of the nerve roots *cervikal* by the protrusion of the *discus intervertebralis*, the symptoms

are neck pain that spreads to the shoulders, upper arms or lower arms, parasthesia, and weakness or spasm of the muscles. Some of the conditions on the neck caused by a shift or clamping of the nerve roots or disorders of the *intervertebral foramen* may be accompanied by signs and symptoms of *cervical root syndrome*. Conditions tebananyak in this case caused by the process of *degenerative* and *herniation of discusintervertebralis*.

The theory says TENS can be used on a variety of state of one of the patient's *Cervical root syndrome (CRS)*. TENS works by stimulating the nerve fibers of type α β which can reduce pain (Corwin 2009). Its mechanism of action is estimated through 'closing the gate' the transmission of pain from the nerve fibers are small by stimulating the nerve fibers is large, then the nerve fibers large will close the path of pain messages to the brain and increase blood flow to the painful area and TENS also stimulate the production of anti-pain natural body that endorphin (James et al. 2008). If TENS is given with the techniques and the correct dose, the change in pain will occur through the process blocks the transmission of pain. TENS also cause simultaneous movement on the skin are perceived as massage, causing a relaxation effect on the patient. The simultaneous movement of the contained in the TENS believed to affect the hypothalamus to stimulate the pituitary gland release of β endorphin, namely chemical compound endogenous that can provide a calming effect to the body (Knight & Droper 2008, Nuach, Widyawati & Hidayati, 2014).

In general, for starters only one root that experience irritation of the heaviest, then the other two suffered the same fate because of the difference in the degree of irritation, time difference in emphasis, clamping and so forth. Then radicular pain due to irritation of the 3 root posterior can also be felt by the patient as pain neurogenic consisting of a sharp pain, dull and paraesthesia. Pain arising in the cervical vertebrae felt in the area of the neck and the back of the head though the pain can be projected into the area of the shoulders, upper arm, forearm or hand. A sense of pain in thepicu/aggravated by movement/neck position specific and will be accompanied by tenderness, and limited movement of the neck (Wahyuni, Sugiarti & Ramdani, 2019).

Pain arising in the case of cervical root syndrome often happens because of the age factor, posture or attitude of the body, the duration of work and duration of work in a relatively long time. This happens because with the workings of a muscle in a long time will cause the muscles into a spasm of, shortening of the size of the muscle, stimulate the occurrence of crosslink acting myosin as well as a decrease in blood circulation which ultimately led to the trigger point (Daniel,2013). In patients with a diagnosis of Cervical Root Syndrome usually difficulties or limitations in performing daily activities. An example is the activity of the patient when lifting, take, move. The activity of the patient with the position of the neck is the same and in a long time this is what makes the presence of pain, spasm and the presence of the limitations of the LGS. With the modalities provided by the physiotherapy aims to eliminate or reduce

the complaints of the patients which lead to the existence of limitations in performing daily activities. To cope with the pain of the patient using the modalities of TENS.

The Results Of The Evaluation Of The Functional Activity Of The

Patients in the name of Mr. A the age of 32 years with a diagnosis of *Cervical Root Syndrome* (CRS) with complaints of pain silent, press, and motion, the limitations of the scope of the joint motion, the presence of spasm of the muscles of the *upper trapezius*, as well as a decrease in the functional activity of the neck of day-to-day. After getting physiotherapy treatment for 3 times using TENS and Neuro Mobilization dct obtained positive results such as a decrease in pain still, the press, and of motion, an increase LGS, and increased functional activity.

Table 6. Evaluation of the functional Activity of using a *Neck Disabilty Index*

No	Category	Value
1	Level of pain	1
2	Treatment inri	1
	Mengangkat	1
4	Read	0
5	headache	0
6	Concentration	0
To	Work	1
8	Drive	1
9	Bedroom	1
10	Rec	1
Total:		7

$$\begin{aligned}
 \text{Number:} &= 10 \times 5 = 50 \\
 &= 7/50 \times 100 \\
 &= 14\% \text{ (categories of light)}
 \end{aligned}$$

After getting physiotherapy 3 times obtained results as above. Of the 10 items penialian include : pain intensity, personal care, lifting activities, the activity of reading, headaches, concentration, activity, work, driving, sleeping, and recreation. From the results of the Sum of all components of the assessment increase, which at the beginning of the first therapy of patients classified in the category of experiencing limitations in the day that is being. Up at the end of therapy already experienced an increase in the patient was classified in the category of limitations of activities sofat lighter. According to Howell (2011) the lower the number the value of the functional is then disabiliti patients are also increasingly low. The increase in the functional activity can be increased due to pain and spasm reduced.

Table 7. The evaluation of ROM

Regio	Dextra	Sinistra	Normal
Shoulder	S : 45 - 0 - 180	S : 45 - 0 - 180	S : 45 - 0 - 180
	F : 45 - 0 - 180	F : 40 - 0 - 180	F : 45 - 0 - 180
	R : 90 - 0 - 85	R : 90 - 0 - 85	R : 90 - 0 - 85
Elbow	S : 5 - 0 - 140	S : 5 - 0 - 140	S : 5 - 0 - 140
Wrist	S : 40 - 0 - 80	S : 60 - 0 - 110	S : 60 - 0 - 110

Based on the evaluation table ROM can be concluded that the ROM is able to (1) maintain the strength of muscles, (2) keep the pergerakanpersendian, (3) blood flow, (4) avoid the occurrence of deformities. ROM exercise resulted in an increase in the circulation of blood in the internal capsule of the joints and improve flexibility of the joints so that the pain can be reduced even resolved (Suratun, 2008 Hannan, 2016). ROM exercise is a simple activity that is able to give effect to the change in the pain scale. In addition, the difference in pain scale before and after a workout ROM can be used as a benchmark. Conclusions can be drawn if the ROM exercises are able to affect the change in scale of the pain of osteoarthritis while maintaining the range of motion of the joints so that the improvement occurs in the joints are problematic.

This is reinforced by research (Khan, 2016) that after 2 weeks of treatment, patients with neck pain showed a decrease in pain are real as compared with the control group ($P < .001$). To level before and after the t-test paired samples was used and the results with values of p less than 0.05 considered significant. The average difference of 0.94 (VAS) with a p-value significant ($P < 0.01$) obtained showed an increase respectively in the score scale of the pain numeric. Traction cervical manual when used with ROM exercises and conventional modalities is an effective method to reduce pain in radiculopathy cervical. Recent literature supports the protocol involving multiple interventions.

Cervical Root Syndrome is the normal result of degenerative changes such as high disc wrinkled and joints zygapophyseal hyperplasia, characterized by neck and shoulder pain with the combination of the loss of sensory or loss of motor function (Liang et al, 2019). Patients in the name of Mr. A 32 years old, diagnosis of physiotherapy experience Cervical Root Syndrome with symptoms of pain and muscle weakness radiating from the cervical to the upper extremities to the fingers of the hand. after getting Physiotherapy 3 times to get the following results : (1). Causest to decrease the pain in cervical, namely there is the addition of ROM on some field of motion. (2). There are pele tone points NDI which signifies that the patient is gradually can release ketergantunganannya with other people in the activity diary. Patients showed improvement of symptoms was significantly related to the literature of physical therapy showed that patients with radiculopathy cervical can benefit from a multi-treatment includes traction cervical intermittent, therapeutic interference and exercise therapy (Deolankar, Toshniwal, Chitapure & Malani, 2021).

Conclusion

Patients in the name of Mr. A the age of 32 years with a diagnosis of *Cervical Root Syndrome* (CRS) with complaints of pain silent, press, and motion, the limitations of the scope of the joint motion, the presence of spasm of the muscles of the *upper trapezius*, as well as a decrease in the functional activity of the neck of day-to-day. After getting physiotherapy treatment for 3 times using TENS and Neuro Mobilization obtained positive results such as a decrease in pain still, the press, and of motion, an increase LGS, and increased functional activity.

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