PROVISION COMBINATION OF CERVICAL TRACTION AND NEURAL MOBILIZATION MODALITY IN PHYSIOTHERAPY MANAGEMENT IN CERVICAL RADICULOPATHY: A CASE REPORT

Anggun Agiel Kurniansari [1], Arif Pristianto [2], Putri Rochmaningtyas[3]

[1] *Physiotherapy Department, Faculty of Health Sciences, Universitas Muhammadiyah Surakarta*

*Corresponding author: Anggun Agiel Kurniansari, Email: anggunagiel28@gmail.com

Abstract

Introduction: Cervical radiculopathy (CR) is a condition described as neck pain radiating to one or both sides of the upper limb, allowing sensory, reflex and even motor disturbances to occur. The incidence of CR was recorded as 1.07-1.75 per 1000 males and 0.68-5.8 per 1000 females. Most of the improvement was obtained through non-surgical measures, that physiotherapy management will be described in the form of a combination of cervical traction (CT) and neural mobilization (NM) modalities.
Case Presentation: A 52-year-old female patient complained of neck pain up to her left arm, appeared forward head posture, was diagnosed with cervical radiculopathy due to narrowing of the intervertebral disc from C5-7 (SMRI results).
***Management and Outcome*:** After 6 treatments, pain reduction was obtained from T0: 4/10 to T5: 2/10 numeric rating scale (NRS), the results of the goniometer measurement of the joint range of motion (ROM) neck flexion T0:42˚ to T5:45˚ and decreased disability rate from 35% (T0) to 42% (T5) neck disability index (NDI) score.
Discussion: The use of CT provides a short-term analgesic effect, increasing the intervertebral foramen space that the pressure between the discs decreases. While the NM technique will increase the ability of nerve gliding and decrease nerve mechanosensitivity.
Conclusion: The combination of CT and NM modalities can reduce pain, increase ROM and decrease disability in CR patients.

Keyword: *cervical radiculopathy (CR), radicular pain, cervical traction, neural mobilization, physiotherapy*

Introduction

Cervical Radiculopathy (CR) is a clinical condition caused by compression of the nerve roots in the cervical vertebrae. The clinical manifestations of CR are very broad but the usual symptoms are pain, sensory deficits, motor deficits and reduced reflexes or even a combination of these (1). The incidence of cervical radiculopathy cases based on epidemiological data is 1.07 to 1.75 per 1000 for males and 0.63 to 5.8 per 1000 for females (2). CR is more likely to occur in the elderly in whom the spine has degenerated, with an estimated risk of developing CR in the 50 to 54 year age range (3).

Cervical radiculopathy caused by nerve root compression may occur in 2 conditions such as disc herniation or bone osteophytes affecting cervical nerve roots. In an epidemiological study it was explained that the C7 nerve root (C6-7) herniation was the most commonly affected nerve root, followed by by nerve roots C6 (C5-6) and C8 (C7-T1 herniations). Narrowing of the nerve roots caused by disc material nerve damage both mechanically and chemically. Mechanically in the form of nerve compression that allows local ischemia and nerve damage, then chemical damage cause further sensitization and an increase the pain in related area (4). The high number of nerve root damage that occurs at levels C5-6 and C6-7 is associated with biomechanics of the cervical spine, where at levels C5-6 and C6-7 maximal flexion and extension movements occur and are at high loading. Cervical radiculopathy is a common cause of neck and arm pain with characteristic symptoms of pain radiating to the upper extremities according to a dermatomal distribution. Sensory symptoms (pain, numbness and paresthesias) may also be accompanied by weakness or altered reflexes depending on the level of the cervical nerve root involved (5).

Provocative tests were conducted to identify potential sources of neuropathic pain felt by the patient. In this case, the spurling test shoulder abduction and neck distraction can be selected for CR with a moderate sensitivity value or around 50% with a high specificity value of more than 80% (6). Imaging for CR cases should be in the form of radiographs, computed tomography scans or magnetic resonance imaging (MRI). Radiographs are usually taken from an anteroposterior (AP) and lateral view of the cervix. The data obtained from radiographs can be in the form of disc height and degenerative changes, while imaging performed from a lateral view angle will obtain better foramen evaluation results. MRI provides soft tissue evaluation for disc herniation and signs of myelomalacia. Then for imaging a CT scan is suitable to provide an explanation in the form of pathology and information on the presence of disk impingement (1). Various conservative treatments can be use as options in the management of patients with CR, but unfortunately there is not much evidence that explains which conservative treatment gives the best results in this case. The combination of two or more modalities (multi-treatment) in CR cases is widely chosen by

medical personnel and most patients have obtained improvement from non-surgical treatment for CR cases. Based on the explanation above, it can be concluded that the purpose of this study is to describe the management of physiotherapy by administering a combination of cervical traction and neural mobilization modalities in CR patients.

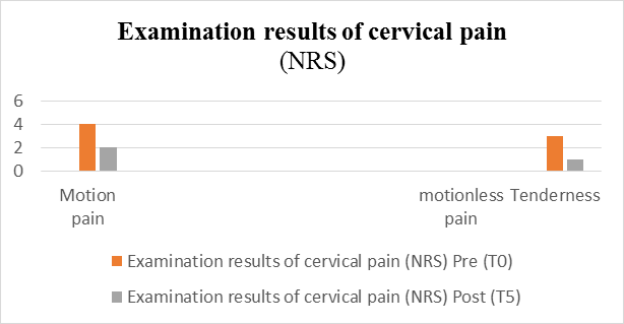
Case Presentation

A 52-year-old female patient works as a nurse. 5 years ago, the patient underwent cervical MRI with the result that there was a narrowing of the right and left C5-7 intervertebral discs resulting in irritation of the C5-6 and C6-7 nerve roots. After a few years, the complaints subsided, but approximately 3 months ago, the patient again felt radiating pain and even interfered with the patient's daily activities, including work. The patient came to the orthopedic poly and received a referral to a medical rehabilitation clinic, the patient explained that the main complaint he felt was neck pain to the left arm and it felt worse when he woke up. It was also stated that the patient has a habit of stretching his neck when he feels tense by making sudden movements to the right and left, the patient is also used to sleeping with stacked pillows, the patient appears to have a slightly forward head posture. The patient took celexocib 200 mg according to the prescription given by the doctor.

Management and Outcome

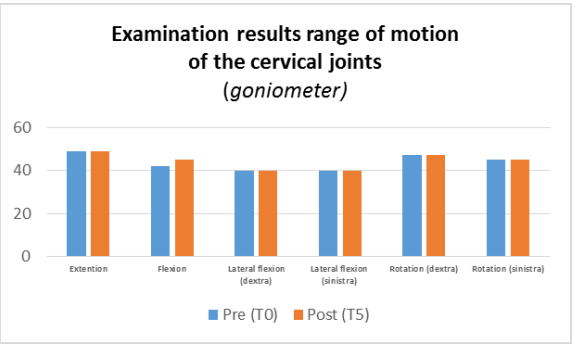
The patient's therapy visit schedule is every 2 times a week (total 3 weeks) and treatment is given in the form of a combination of 2 modalities, namely CT and NM and is given education at the beginning of the visit. The main goal of therapy is to reduce the intensity of radiating pain and for other purposes such as correcting posture and increasing ROM, especially in neck flexion motion so that an increase in the ability of daily activities will be obtained without any significant complaints. There are several examinations related to patient complaints such as pain using a numerical rating scale or NRS (table 1), joint range of motion using a goniometer (table 2), and to see the level of patient disability an examination using the neck disability index (NDI) (table 3).

Table 1. Results of pain assessment using the Numeric Rating Scale (NRS)



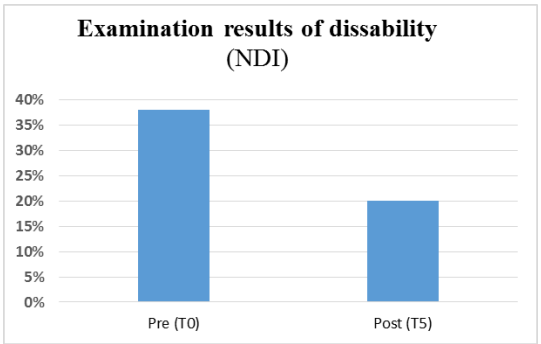
Pain assessment using the NRS where the scale consists of a value of 0 to 10 where 0 is no pain, 1 to 3 mild pain, 4 to 6 moderate pain and 7 to 10 severe pain. Motion pain only occurs when neck flexion is radiating and intermittent, motionless pain is not found, while tenderness occurs when palpation or emphasis is placed on the area m. upper trapezius.

Table 2. Results of ROM examination cervical (goniometer)



Examination of the ROM cervical joints was performed using a goniometer and only on cervical flexion which experienced an increase in from 42° (T0) to 45° (T5).

Table 3. Results of the CR (NDI) patient disability examination



Based on the examination of the degree of disability in the CR patients above, it was found

that there was a decrease in the percentage score of the NDI from 35% (T0) to 20% (T5), where the interpretation of the NDI score if 0-20% means minimal disability (mild), 20-40 % mild disability, 40-60% severe disability, 60-80% paralyzed and 80-100% completely disabled.

A special test or provocative test is given in the form of a spurling test, this test is used in cases of cervical radiculopathy. The specific value of the spurling test is 93% to be use as a diagnosis of CR, while the sensitivity value is 30% (7). The test is performed with the patient sitting relaxed, the patient neck extension and rotation to the side of the complaint (in this case left rotation) then the therapist applies pressure above the patient's head in a forward downward direction. Positive finding in the form of radicular pain to the ipsilateral side according to the direction of rotation where in this case the pain radiates to the left arm so that the patient is positive for CR. The next test is the distraction test which has the same purpose as the spurling test, carried out with the patient sitting, the therapist's palm is placed under the patient's chin and the other hand holds the patient's occipital & temporal area, then gives a pull or distraction in an upright direction to reduce the burden in the cervical area, if there is a decrease in pain from the previous pain intensity, the patient is positive for cervical radiculopathy. The specific value of the distraction test for the diagnosis of CR is 0.86 and with a low sensitivity value of 0.50 (8).

Education was given at the beginning of the visit (T0) with the aim of supporting the healing process of the CR patient. One of the educations given is in the form of posture correction by exemplifying how to properly position the head, namely the axial extension position or neutral neck position according to the recommendation of a physical therapist to reduce neck pain and spasm in the upper trapezius muscle, which CR patients often complain about (9). Mentions in the results of his research that there is an improvement in pain, function and a decrease in the level of disability after being given a combination of 2 modalities of cervical traction and neural mobilization in CR patients. The combination of the two modalities was carried out simultaneously and carried out by 2 therapists. Cervical traction is given with the aim of increasing the inter disc space and the intervertebral foramen space so as to reduce pressure on the problematic nerve roots. The results of traction will be maximized if performed in a state of muscle pain has subsided, CT (10).

The therapy is carried out in a relaxed supine position with the patient's spine in a comfortable position. CT was performed in 10 sets with intermittent mode which was given in stages from grade II, grade III and grade IV. Each set is performed for 60 seconds (1 minute) with 30 seconds of rest. Simultaneously with manual cervical traction, the patient was given NM with one of the goals to facilitate nerve gliding ability. The neural mobilization technique is a technique that includes passive motion of repetitive flexion and extension of the elbow, wrist and fingers of

the involved side and is applied slowly and oscillatingly. NM administration was initiated with low medial nerve mechanosensitivity (neutral position), then progressively increased to 90° shoulder abduction combined with external rotation to further facilitate nerve gliding and reduce the level of nerve mechanosensitivity (11).

Discussion

Physiotherapy management in CR patients with complaints of pain radiating from the neck to the left arm, tenderness in the m. upper trapezius, limited neck flexion and decreased functional ability in daily activities such as work. Patients receiving CT and NM treatment 6 times for 3 weeks of therapy have obtained a decrease in pain intensity from T0:4/10 to T5:2/10 (NRS), an increase in the degree of joint neck flexion range of T0:42° to T5: 45° (goniometer) and the final result was a decrease in the neck dissability index (NDI) score from 35% (T0) to 42% (T5). Giving CT will get a short-term analgesic effect and provide space between the vertebrae cervical which will expand the area of the intervertebral foramen so that there is a decrease in intra-disc pressure (11). The analgesic effect obtained plays a role in reducing pain in CR patients.

Giving NM will provide a neural mobilization technique were able to significantly increase the flow of nerve intraneural and dispersion of liquid nerve and improve edema intraneural and flow aksoplasma the liquid contained in and around the myelin sheath, which with increasing aksoplasma were allegedly able to reduce the deficit in sensory and motor on the part of the involved limb so There will be a decrease in symptoms such as numbness, tingling, weakness and muscle tension. As the results have been obtained, pain reduction occurs not only in motion, neck flexion tenderness in thearea m. The upper trapezius also experienced a decrease, the motor deficit as previously complained, namely the limitation in motion, neck flexion also improved, which showed an increase in the ROM neck flexion. Neural Mobilization has 2 techniques, namely sliding and tensioning, the technique is slinding considered more comfortable in patients with conditions of increased irritability and the severity of symptoms felt. So that the administration of NM in this patient uses atechnique sliding. The benefits that exist in NM will restore a state homeostatic in and around the nerves through the action of nerve mobilization, reducing nerve adhesions if this occurs where adhesions nerve will interfere with the ability of the nerves in motion sliding, reduce the level of mechanosensitivity nerve or reduce the activity of the nervous system. mechanoreceptors present in the related areas (11). Through the reduction of both sensory symptoms and motor skills after being given the combination of these modalities, the decrease in disability in patients also decreased according to the results of the pre and post NDI examination above.

Conclusion

A 52-year-old female patient with a diagnosis of cervical radiculopathy due to C5-C7 nerve root irritation (disc herniation), for 6 times (3 weeks) a combination treatment of 2 modalities in the form of CT and NM was given and there was a decrease in radicular pain, decreased tenderness in m. upper trapezius, an increase in the range of motion of the cervical joints, especially in neck flexion and a decrease in the NDI score with the interpretation of the patient being classified as mildly disabled.

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