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PHYSOTHERAPY MANAGEMENT IN POST OPERATION SYRINGOMYELIA: A CASE STUDY

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Abstract

Introduction: Syringomyelia is a disorder of the central nervous system, this disorder is often associated with the appearance of cysts (syrinx) in the spinal cord. The presence of this syrinx causes pressure on the spinal cord, thus it is followed by muscle weakness and pain. The incidence of syringomyelia cases is very little, namely 8.4/100,000 or only 2%. Physiotherapy treatment in cases of syringomyelia is usually in postoperative care. Due to the scarcity of this case, there is limited information regarding physiotherapy treatment in cases of syringomyelia.
Case description*:* A 51-year-old woman was diagnosed with syringomyelia through an MRI scan, after undergoing surgery, she complained of silent pain. Following the surgery, the patient underwent rehabilitation by physiotherapy since she complained of silent pain on the upper limb.
Intervention and Outcomes*:* The patient received treatment from physiotherapists in the form of IR and TENS. The intervention was given for 2 weeks, with a 10 minutes duration of IR and 15 minutes duration for TENS. Evaluation was done every week, where every week there was a reduction in pain, which was VDS (Verbal Descriptive Scale) 7/10 to 0/10.
Discussion and Conclusion*:* Physiotherapy can handle the side effects that occurred after syringomyelia surgery 6 months ago, which in this study showed a decrease in the silent pain score. However, the decrease of silent pain is only temporary, because the patient continued to complain of discomfort the next day.

Keyword*: Syringomyelia, Pain, TENS, IR,VDS*

Introduction

Syringomyelia is a disorder of the central nervous system, this disorder is often associated with the appearance of cysts (*syrinx*) in the spinal cord. The existence of this *syrinx* inflicts pressure on the spinal cord, followed by muscle weakness and pain. According to previous studies, *syringomyelia* is defined as a disease that manifests various neurological symptoms, cystic cavities formed in the spinal cord caused by Chiari deformation, spinal cord tumors, spinal cedar, and meninges fibrosis (1). Syringomyelia is defined as the development of cerebrospinal fluid (CSF)-filled cysts in the spinal cord. Syringomyelia is a rare neurological condition with chronic consequences and can cause disability in the patient's life (2), this is supported by previous studies which stated the prevalence of syringomyelia which was only 8.4 cases per 100,000 population, and it was more common in men than women (Mishra, Kimaya & Kanchi, 2019). The prevalence of Syringomyelia is estimated at 8.4/100,000. Syringomyelia cases are reported with an incidence rate of only 2% (4). The pathophysiology of syringomyelia remains idiopathic but is generally associated with an imbalance in fluid pressure that causes fluid outflow into the syrinx (5). There are several symptoms that usually appear in cases of syringomyelia, such as segmental sensory loss (93%), pyramidal signs (82%) and muscle atrophy (60%) (6). TENS delivers an electric current through the skin to reduce pain**,** it is effective in several clinical conditions associated with inflammatory, neuropathic, and non-inflammatory pain (7). Syringomyelia is a condition associated with congenital abnormalities, such as Chiari malformation, but also develops as a sequela of neoplasms, infections, umbilical cord, and trauma (8). Syringomyelia patients usually have several symptoms, such as progressive weakness, back pain, shoulders, arms, legs, loss of temperature sensation, facial pain and numbness, loss of pain sensation, difficulty walking, bowel and bladder dysfunction, and increased spinal curve**.**). In general, syringomyelia is treated with surgery, but it is not uncommon for some patients who undergo surgery to experience some problems as a result of the surgery which has been performed. This is supported by previous studies which mention syrinx management that includes surgical and conservative management, where surgical intervention aims to restore CSF flow**,** several studies have shown that there is a risk of severe and progressive neurological damage following the surgery (9). The role of physiotherapy is **s**ubsequent to the surgery where physiotherapy aims to deal with problems that arise after the surgery is performed**,** which is the pain problem. Thus, this study aims to determine the effect of physiotherapy intervention in patients with syringomyelia with TENS and IR treatment on pain reduction.

Case Presentation

A 51-year-old woman who works as a household assistant came to physiotherapy complaining of pain in her upper shoulder. The patient described silent pain with a score of 7 out of 10. It is known that 6 months ago the patient was washing clothes, and suddenly felt a very excruciating pain, and was examined by a doctor and then was advised for an X-ray, it was found from the results of the MRI that the patient was diagnosed with syringomyelia, thus she was referred for a surgery to be performed. A week after undergoing surgery, the patient attended a physiotherapy program. From the anamnesis, it was found that no family members had the same complaints as the patient. Previous studies have stated that *syringomyelia* patients usually have several symptoms, one of which is upper back pain (3).

Management and Outcome

The measuring instrument used in this patient is the VDS (Visual Descriptive Scale) as a silent pain measurement tool. The pain score consists of a range of 0 to 10, where 0 = no pain, 1-3 = mild pain, 4-6 = moderate pain, 7-9 = severe bearable pain. And 10 = severe unbearable pain. Physiotherapy intervention in the form of treatment using IR (Infra-Red) and TENS (Transcutaneous Electrical Nerve Stimulation) 10-50 Hz modalities with an intensity according to the patient's tolerance, was carried out for 2 weeks by giving the modality 2 times/ week. IR was applied with a distance of 40 cm between the IR and the skin. From the result of the intervention there was a decrease in pain, this was proven by the pain measurement before the intervention which was assessed using a VDS on the scale of 7/10 that decreased to 0/10. It is acknowledged that the patient consistently participated in intervention activities from January to June, at the beginning of the intervention the patient had very disturbing spasms and limitations of motion, and after regularly participating in the intervention there were no more spasms nor limitations of motion. The patient complained of soreness if she did not regularly seek the intervention, so patients consistently came to physiotherapy.

Discussion

Based on the results of the data obtained from research which was conducted for 2 weeks, where evaluation was carried out every week after the patient was intervened, there was a temporary decrease in silent pain because the patient then complained of silent pain the following day. There are several previous studies that mention the treatment of syringomyelia, as in the previous studies (9) which stated that conservative management can reduce pain but cannot reduce the size of

syringomyelia, where in this study patients were given interventions in the form of pain

management, cervical traction, joint mobilization and manual therapy in soft tissue indicated for postural correction and biomechanics in combination with drugs, it was found in this study that patients experienced a decrease in the pain score measured using the VAS (Visual Analog Scale) with a pre value of 90/100mm to 30.100mm and NDI (Neck Disability Index) from 39 to 25, it was concluded in this study that physiotherapy treatment can be an alternative, in addition to syringomyelia surgery for symptomatic management, physiotherapy treatment is incapable of reducing the size of the syrinx. The study of Jugowice D et al (13) in this study examined a 44-year-old man with no history of spinal cord trauma, infection or other pathological processes, the patient came with complaints of progressive chest pain and left leg paresis, from the results of MRI (Magnetic Resonance Imaging) the patient was diagnosed with syringomyelia at T5-T7 and cranial hydromyelia, in this study using a minimally invasive technique, where this technique is effective for the idiopathic syrinx, it was found in the results of the study that it was effective in treating cases of idiopathic syrinx. Vilella's study (14) Idiopathic syringomyelia is a condition in which cystic cavities appear within the spinal cord, the diagnosis of syringomyelia was at C3-C6, 3 years ago, where the patient was a former volleyball athlete with no muscle atrophy or limb paraesthesia, however, he began to experience persistent back and neck pain, restricting his functional abilities in sports (jogging, volleyball) and independent activities. The patient was given physiotherapy treatment in 6 sessions, increasing muscle strength, myofascial release, dry needling, and muscle strengthening exercises, the results showed that physiotherapy intervention can be an effective treatment for syringomyelia which shows symptoms of myofascial pain syndrome. The previous study used a 33-year-old woman with a diagnosis of syringomyelia. The patient was reported to the neurology department for sensory disturbances and shoulder pain for several months. Once admitted, Neurological examination reported a right hand muscle deficit, loss of temperature sensation, and asymmetric tendon reflexes. Several weeks earlier, an MRI of the patient's spine showed Arnold Chiari malformation, syringomyelia and C5/C6 and C6/C7 discopathies. The patient then underwent medial suboccipital craniectomy and a month later was admitted to the neurologic rehabilitation department for paresis and sensory disturbance of the right upper extremity. After being given treatment by physiotherapy, motor function was detected.

TENS (Transcutaneous electrical stimulation) utilizes an external stimulator that delivers high frequencies (10-15 Hz) (conventional) (10). TENS is a self-noninvasive technique that conducts electric current through the skin surface by activating peripheral nerves, where electrophysiology

shows that TENS-induced afferent activity can inhibit the transmission of nociceptive information in the CNS (central nervous system), and produce hypoalgesia, thereby reducing pain (11). Infrared is the emission of electromagnetic waves used for superficial complaints. There is a sedative effect from the infrared where heat stimulation reaches the subcutaneous tissue which will result in vasodilation of blood vessels, so that the flow in blood vessels increases and substance P or metabolic waste will be wasted. In addition, the heating effect will also increase metabolism which will result in an upsurge in the supply of nutrients and oxygen to the tissues hence the pain is reduced. The heat produced by infrared stimulates peripheral nerve endings (neurons) which will activate A alpha and A delta nerve fibers that can activate inhibitory neurons, such as inhibitory amino acids and neuropeptides, these substances bind to primary afferent receptors and dorsal horn neurons. As a result, nociceptive transmission will be inhibited by pre-synaptic and post-synaptic mechanisms and nociceptor transmission will decrease. Therefore, the pain impulses are not sent directly to the brain though are more modulated which results in reduced pain (12).

Conclusion

Syringomyelia is a disorder of the central nervous system, this disorder is often associated with the appearance of cysts (syrinx) in the spinal cord. The existence of this syrinx causes pressure on the spinal cord, followed by muscle weakness and pain. In cases of syringomyelia, it is often treated with surgery. Physiotherapy plays a role in dealing with several complaints that emerge after the patient undergoes surgery, one of the problems that often arises and is complained of is pain. In this study, researchers used IR and TENS as interventions in managing pain in postoperative syringomyelia patients. The results of this study indicate that there is a significant reduction in pain, as indicated by the VDS pain score reduction of 7/10 to 0/10. However, this study has several limitation, such as the pain reduction is only temporary. In addition, there is no long-term follow-up.

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