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Use of Tens in Chronic Pain Management and Nursing Care

Kronik Ağrı Yönetiminde ve Hemşirelik Bakımında Tens Kullanımı

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ABSTRACT

Chronic pain is pain that lasts more than three months. Since chronic pain decreases the quality of life, it can lead to significant negative economic effects by reducing the individual's participation in work life and productivity. For these reasons, it is very important to control pain. Pharmacological and non-pharmacological methods are used in pain control. Non-pharmacological methods include complementary applications such as Transcutaneous Electrical Nerve Stimulation (TENS). In the nursing regulation in our country, the use of TENS is shown as a nursing intervention in the segment 'applied with the decision of the physician and applied together with the physician. TENS is an adjunctive treatment modality that has been widely used in the clinic for many years to manage a variety of painful conditions. In our country, the use of TENS is available in nursing interventions but is not routinely used in care. In its current form in the regulation, it may be recommended that nurses use TENS in the treatment of chronic pain after receiving the necessary training together with the physician.

Keywords: Chronic Pain, Nursing, Nursing Care, TENS.

ÖZET

Chronic pain is pain lasting longer than three months. Since chronic pain reduces the quality of life, it can lead to negative economic effects by reducing the individual's participation in work life and productivity. For these reasons, it is very important to control pain. Pharmacological and non-pharmacological methods are used in pain control. Non-pharmacological methods include complementary applications such as Transcutaneous Electrical Nerve Stimulation (TENS). In the nursing regulation in our country, the use of TENS is shown as a nursing intervention in the segment 'applied with the decision of the physician and applied together with the physician'. TENS is an adjunctive treatment method that has been widely used in the clinic for many years to manage various painful conditions. In our country, the use of TENS is available in nursing interventions but is not routinely used in care. In its current form in the regulation, it may be recommended that nurses use TENS in the treatment of chronic pain after receiving the necessary training together with the physician.

Anahtar kelimeler: Hemşirelik, Hemşirelik Bakımı**,** Kronik Ağrı, TENS.

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INTRODUCTION

Pain is a global health problem with negative consequences for patients, societies and health systems (Johnson et al., 2020). Chronic pain is defined as pain lasting longer than three months (Kılıç, 2017). Cochrane Reviews, it has been reported that half of the adult population complains of chronic pain and 10% to 20% clinically experience significant chronic pain (Gibson et al., 2019). Since chronic pain decreases the quality of life, it leads to negative economic effects by decreasing the individual's participation in work life and productivity (Gibson et al., 2019). Pharmacological and non-pharmacological methods are used in pain control. Pharmacological treatments used in pain control include nonsteroidal anti-inflammatory drugs (NSAIDs), opioids and adjuvant analgesics. Non-pharmacological methods include applications such as hot-cold application, Transcutaneous Electrical Nerve Stimulation TENS (Transcutaneous Electrical Nerve Stimulation) massage, exercise and cognitive behavioural therapies (Kılıç, 2017). In the management of pain, which is a very complex and multidimensional experience, the use of TENS is recommended as a noninvasive, easy, cheap and reliable treatment method in combination with drugs (Erden & Çelik, 2015). TENS is a nonpharmacological method used in the treatment of acute and chronic pain (Vance et al., 2022). TENS requires the application of electrical currents, which are usually produced by small portable devices, and provides stimulation of nerves through the skin to reduce pain. The use of TENS is quite simple, portable, self-administered and inexpensive. From this point of view, if it is found to be effective and safe, it may be an important option for people with chronic pain (Travers et al., 2020).

Transcutaneous Electrical Nerve Stimulation (TENS)

TENS is a form of electroanalgesia in which electrical nerve stimulation is applied therapeutically through the skin (Gibson et al., 2019; Brosseau et al., 2003). TENS, which is a non-pharmacological method, reduces pain by applying the electric current produced by small portable devices through the skin and stimulating the nerves (Travers et al., 2020). According to the gate control theory, impulses from TENS should be transmitted to the central nervous system (CNS). The transmission of this electric current is strengthened by placing the electrodes in the optimum body regions. Electrodes are placed directly over the painful area, skin nerves, acupuncture points or other trigger points, providing electrical stimulation to the underlying peripheral nerves (Brosseau et al., 2003).

History of TENS

For the first time in the world in 46 BC, Scirbonius Largus stated that the electric eel had a therapeutic effect on headache and arthritis-related pain. In the 19th century, James Churchill used electrical impulses obtained with various devices for therapeutic purposes. The importance of TENS in pain treatment has increased considerably with the gate control theory in pain physiopathology, first proposed by Melzack and Wall in 1965. In a study conducted in 1967, TENS became the most commonly used treatment method with the reduction of neuropathic pain as a result of stimulation of thick fibres with high frequency current (Erden & Çelik, 2015).

Tens Device

There are many TENS devices with different features in the market. Choosing the TENS device that will provide effective analgesia is only possible by knowing the indications for use and the technical features of the device. The device is large enough to be carried in a pocket or worn on a belt and is battery operated. New model TENS devices have 2 channels and the parameters of each channel can be adjusted independently of the other. This is advantageous in patients with pain of different character and widespread. Power supply, amplifier and electrodes are required for stimulation of the peripheral nervous system. The power supply and amplifier are located in the TENS device. The current produced is usually in the form of a biphasic wave and has zero electric charge. In this way, skin irritation caused by ionisation is prevented. The current produced in the power supply is increased in the amplifier and reaches the electrodes and electrical stimulation begins (Erden & Çelik, 2015; Aydın& Nazlıkul, 2021; Başer & Taşçı, 2015).

Mechanisms of Tens in Pain Reduction

TENS application, a form of electroanalgesia, shows analgesic effect through skin stimulation. This effect has been explained by various theories. According to the gate control theory proposed by Melzack and Wall, TENS is thought to produce analgesia. According to this theory, the stimulus from TENS is transmitted to the central nervous system (CNS) (Brosseau et al., 2003).

Depending on the effectiveness of TENS, the frequency and intensity of TENS can be adjusted. TENS can be applied at low frequencies (LF), <10 Hz, high frequencies (HF), >100 Hz or mixed frequencies (LF and HF) (Vance et al., 2022). At clinically used frequencies and

intensities, TENS activates large diameter afferent fibres in the periphery that send messages to the central nervous system (Vance et al., 2014). Afferent impulses are sent to the central nervous system to activate descending inhibitory systems to reduce hyperalgesia. In this way, TENS reduces hyperalgesia through both peripheral and central mechanisms (Vance et al., 2014). According to the gate control theory of TENS, it is suggested that large afferent fibres inhibit central nociceptive transmission, resulting in a decrease in pain perception (Gibson et al., 2019). In short, it is stated that TENS alleviates pain in the spinal ligaments and electrical stimulation of the nerves moves the pain-relieving substances naturally present in the body in a free state and thus reduces pain (Kılıç, 2017).

Use of Tens in Nursing Care

In Annex 3 of the nursing regulation in our country, the use of TENS is shown as a nursing intervention as it can also be used in nursing care in the segment of TENS is applied together with the physician with the decision of the physician (Nursing regulation, 2011). When international nursing studies on TENS application are examined, it is seen that nurses apply TENS as a non-pharmacological method in pain treatment and provide training to patients for the application of TENS at home (Jahangirifard, 2018; Bjerså, 2015). The New York Nurses Association stated that TENS is an integrative treatment method that should be used in nursing care. It has been stated that special education and clinical experience are important in these methods and that the nurse has a responsibility in informing the patient about the benefits and risks of treatment. It was stated by the association that the nurse has assistant and coordinator roles in TENS application (New York Nurses Association). Nurses, as a member of a multidisciplinary team, play a role in informing the patient before the procedure, preparing the patient for the procedure and TENS application and termination of the application with the physician's decision (Karayurt et al., 2024). There is evidence that nurses apply TENS in pain units in our country. According to the Dokuz Eylül University Hospital Pain Unit TENS application directive, nurses admit patients to the unit, give information about the procedure, take the treatment plan entered on the pain unit form filled out by the doctor and process it on the treatment form, give the patient the appropriate position, control the TENS device and check the electrode, adjusts the frequency and amplitude, determines the mode and sets the duration, selects the appropriate electrode, applies gel and adheres the electrodes of the device to the determined points, starts the procedure, controls, evaluates the patient's compliance with the procedure, and separates the patient from the TENS device at the end of the procedure (Karayurt et al. , 2024). TENS should be used in nursing care to

prevent unnecessary opioid use, to relieve the patient's pain with non-pharmacological methods caused by chronic pain and to improve the quality of care.

International Tens Study Results Used in Chronic Pain Management

TENS is used in pain management in osteoarthritis, rheumatoid arthritis (RA), headache, migraine, neck and low back pain (Johnson et al., 2020; Kılıç, 2017). As a result of the chronic pain study in which 381 studies were analysed, it was reported that pain intensity during or immediately after TENS was lower compared to placebo (Johnson et al., 2020). A review of nine studies did not conclude that TENS was harmful or beneficial in terms of pain control, disability, health-related quality of life, use of pain medication or general impression of change in people with chronic pain (Gibson et al., 2019). No effective result was found in the use of tens application in the treatment of chronic neck pain (Martimbianco et al., 2019). TENS was reported to have an immediate analgesic effect on chronic low back pain (Dias et al., 2021). Another study reported that the combination of heat and TESN did not reduce pain scores in patients with chronic low back pain (Leemans et al., 2021). Similarly, another study found no effect of TENS in the treatment of chronic low back pain (Facciet al., 2011). However, a meta-analysis of 13 studies reported a significant reduction in pain in the treatment of chronic low back pain with TENS (Jaureguiet al., 2016).

CONCLUSION

TENS is an adjunctive treatment method that has been widely used in the clinic for many years to manage various painful conditions. In our country, the use of TENS is available in nursing interventions but is not routinely used in care. In its current form in the regulation, it may be recommended that nurses use TENS in the treatment of chronic pain after receiving the necessary training together with the physician. This review may shed light on increasing the use of TENS in nursing care and clinical studies for evidence-based nursing care.

Clinical Contribution

As a member of the multidisciplinary team, nurses have duties such as information before TENS, patient preparation for TENS, TENS application and termination of the application with the decision of the physician. It is recommended to use TENS in nursing care to prevent unnecessary opioid use, to relieve the patient's pain caused by chronic pain with non-pharmacological methods and to improve the quality of care.

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