E-Poster

EP-372

Dysesthesia-Matched Transcutaneous Electrical Nerve Stimulation Significantly Improved Chronic Pain in Both Lower Limbs and Walking Ability After Transverse Myelitis: A Case Report

Topic: Neurostimulation (rTMS, tDCS, etc.)

Kentaro Kawamura[1], Seiji Etoh[1], Shinichi Togo[2], Megumi Shimodozono[3]

[1]*Department of Rehabilitation and Physical Medicine, Kagoshima University Graduate School of Medical and Dental Sciences,, Kagoshima, Japan*

[2]*Department of Rehabilitation, Fujimoto general hospital, Miyakonojo, Miyazaki, Japan*

[3]*Department of Rehabilitation and Physical Medicine, Graduate School of Medical and Dental Sciences,, Kagoshima, Japan*

BACKGROUND

In recent years, it has been reported that adjusting the pulse width, frequency, and stimulation intensity of transcutaneous electrical nerve stimulation (TENS) in accordance with the patient's dysesthesia can alleviate these symptoms. This method is referred to as dysesthesia-matched TENS (DM-TENS). We applied the treatment to lower limbs of a patient with transverse myelitis (TM) suffering from pain for about 14 years.

CASE DESCRIPTION

A 62-year-old male was diagnosed with TM at the Th5 level approximately 14 years ago. He has incomplete paraplegia and dysesthesia and pain in both lower limbs. For pain management, he has been taking pregabalin, duloxetine, tramadol, and acetaminophen, but their effects have been limited. He continued to experience severe symptoms, with the Short-Form McGill Pain Questionnaire-2(SF-MPQ-2) score of 212, primarily in the anterior thighs and lower legs of both limbs. Dysesthesia-matched-TENS was applied to four areas: the anterior thighs and lower legs of both lower limbs. Dysesthesia-matched-TENS was achieved at 200 Hz, 100 μsec, and 40–50 mA. During the stimulation, there was a remarkable improvement, with the SF-MPQ-2 score decreasing to 5. The improvement was maintained throughout the 20-minute stimulation. Before and during the stimulation, a 10-Minute Walk Test (10MWT) was conducted. In comfortable speed walking, the time improved from 14.9 to 10.3 seconds. In maximum-speed walking, the time improved from 12.0 to 8.0 seconds. The patient also reported a noticeable improvement in balance perception, allowing him to perform the 10MWT without a cane. His comfortable and maximum walking speed further improved to 9.5 and 7.5 seconds without a cane. The symptoms recurred approximately 30 minutes after the stimulation ended.

DISCUSSION

The significant improvement in pain with DM-TENS might also contribute to the motor improvement. By adjusting the frequency, pulse width, and intensity based on the nature of each patient's dysesthesia, the effectiveness of TENS may be maximized. In this case, while the improvement was only observed as an immediate effect during stimulation, repeated rehabilitation treatment under favorable conditions is expected to result in long-term improvements in function and activity.

CONCLUSION

Dysesthesia-matched-TENS significantly improved chronic neuropathic pain in both lower limbs and walking ability in a patient with TM. If we establish a method for adjusting stimulation parameters and demonstrate reproducibility of effects in other patients, we are confident that it will become a widely used and powerful therapeutic tool.

Statement of Disclosures

Not applicable

Corresponding Author:
Kentaro Kawamura
Department of Rehabilitation and Physical Medicine, Kagoshima University Graduate School of Medical and Dental Sciences,, Kagoshima, Japan
Email: kentarok@m.kufm.kagoshima-u.ac.jp

Doi: 10.5606/archisprm.2026.EP-372