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Therapeutic Electrical Stimulation and Nutritional Management For Sarcopenia in a Patient With Rheumatoid Arthritis: A Case Report

Topic: Neurostimulation (rTMS, tDCS, etc.)

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BACKGROUND

The prevalence of sarcopenia is high in rheumatoid arthritis (RA) patients due to secondary factors such as chronic inflammation. To improve sarcopenia, rehabilitation interventions combining resistance training and nutritional management are recommended. However, resistance training in RA patients may exacerbate joint impairments. Belt electrode-skeletal muscle electrical stimulation (B-SES) is a novel therapeutic electrical stimulation method that induces isometric contractions of the lower limb muscles in a non-weight-bearing position. This case report examines the effects of a six-month B-SES and nutritional management program in a patient with concurrent RA and sarcopenia.

CASE DESCRIPTION

The patient was a 73-year-old female diagnosed with RA over a year ago and maintained low disease activity. She was diagnosed with sarcopenia based on the Asian Working Group for Sarcopenia 2019 criteria. Given her concurrent RA and sarcopenia, a six-month rehabilitation program comprising B-SES and nutritional management was implemented. The patient underwent B-SES (G-TES, Homer Ion Institute Co. Ltd, Tokyo, Japan) for 20 minutes once or twice a week in an outpatient setting. The stimulation was administered in "disuse mode" (frequency: 20 Hz; pulse width: 250 μs; duty cycle: 5 seconds contraction, 2 seconds rest). The current intensity was set to the maximum tolerate level. Additionally, she was instructed to consume one nutritional supplement drink (REHADAYS, Otsuka Pharmaceutical Factory, Inc., Tokushima, Japan) containing leucine daily. The average frequency of B-SES was 1.6 times per week, and the patient demonstrated high adherence (95.9%) to the nutritional supplement regimen. No joint-related adverse events were observed during this time. After six-months of rehabilitation treatment, the patient exhibited increased muscle mass (right lower limb: 5.09 kg to 5.27 kg; left lower limb: 4.97 kg to 5.09 kg), improved knee extensor strength (31.0 kgf to 34.5 kgf), and enhanced walking speed (0.5 m/s to 1.0 m/s).

DISCUSSION

B-SES may enable muscle activation without joint stress, making it particularly beneficial for patients with joint-related impairments. We believe that rehabilitation treatment incorporating therapeutic electrical stimulation, such as B-SES, as an alternative to resistance training, in combination with nutritional management, is a safe and effective strategy for managing sarcopenia in RA patients.

CONCLUSION

A six-month rehabilitation program combining B-SES and nutritional management in a patient with concurrent RA and sarcopenia resulted in increased muscle mass, muscle strength, and improved physical performance without joint-related adverse events.

Statement of Disclosures

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