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Effectiveness of Scrambler Therapy on patient with chronic low back pain: A case report

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ABSTRACT

Aims: The leading cause of disability, Chronic Low Back Pain (CLBP), severely impacts a person's quality of life. It creates numerous challenges for clinicians to treat, where Scramble Therapy (ST) is effective and safe for the treatment of CLBP.

Case presentation: A 51-year-old male patient (height 165 cm, weight 71 kg, BMI of 25.3 kg/m2, and a waist-to-hip ratio of 0.98), with >5 years of CLBP, underwent scrambler therapy. The Visual Analog Scale (VAS), the Oswestry Disability Index (ODI), and the modified Schobert test were used to assess the degree of pain, functional impairment, and lumbar range of motion. Following ten sessions of treatment, the Oswestry Disability Index reduced from 50% to 12%, the VAS score went from 7.5 cm to 1.5 cm, and the lumbar range of motion improved (flexion 45mm to 68 mm and extension 21 mm to 32 mm).

Conclusion: In CLBP patients, the ST treatment is successful in reducing the intensity of chronic pain, lowering functional impairment, and improving the lumbar range of motion.

Keywords: Chronic low back pain, Case report, Scrambler therapy

Introduction

The term Chronic Low Back Pain "(CLBP) refers to low back discomfort that lasts longer than three months [1]. It is the leading cause of disability in both developed and developing nations, has a terrible impact on people's quality of life, and lowers productivity at work by increasing work absenteeism [2]. Earlier studies reported that both the prevalence and management costs of CLBP have considerably grown in the United States during the past 20 years [3] A total cost of US$2.2 billion per population and US$1226.25 per patient were reported annually due to CLBP in low and middle-income countries [4]. Multimodal approaches are frequently employed to treat patients. They include medication, anesthetic intervention, surgical approaches, cognitive behavior therapy, relaxation therapy, physiotherapy, and complementary therapy[5]. A safe and affordable treatment option for CLBP is physiotherapy, which uses a variety of exercises and electrotherapy to enhance patients' quality of life and functional independence [6].

The MC5-A Calmar device, commonly known as Scrambler Therapy (ST), is used to treat many different medical conditions [7]. The ST is a novel method for treating pain by electrostimulation and reorganizing the pain center of the brain by the principle of neuroplasticity, which Giuseppe Marineo first described in 2003 [7]. With five channels and a maximum current density of just 0.0002009 W/cm2, the gadget may generate 16 various types of nerve action potential for electro-analgesia. These currents can be delivered and controlled using a dial that ranges from 10 to 70. The US Food and Drug Administration (FDA) has approved this device as a safe and non-harmful treatment option [7-8]. Scrambler Therapy has been shown in studies to significantly improve CLBP [9,10]. This is the first study in Bangladesh, to the best of our knowledge.

Case presentation

This study is a single case study. A 51-year-old male patient (height 165 cm, weight 71 kg, BMI of 25.3 kg/m2, and a waist-to-hip ratio of 0.98), with more than five years of CLBP, (diagnosis was confirmed by Magnetic Resonance Imaging (MRI) who works for a private company, initially underwent pharmacological treatment (NSAIDs and muscle relaxants) but did not find relief. A consultant then recommended him to the physical medicine and rehabilitation department, where he underwent scrambler therapy. He did not exhibit any abnormalities in his respiration, blood pressure, or pulse, and he had no signs of dysesthesia. He also read a thorough explanation of the study's goals and procedures before agreeing to participate in this investigation. After that, written informed consent was obtained from the patient for publication of this case report and accompanying images. Ethical clearance has been obtained from the institutional ethical review board of Sylhet MAG Osmani Medical College Hospital. The study adhered to the principles of the Declaration of Helsinki, revised in 2013. The device (Brand-GEOMC. Model-MC-5A, Competitive Technologies, Inc., Fairfield, CT, USA) was applied to the patient in a prone-lying position with four electrodes implanted above and below the area of the lower back that was the most painful (Figure 1). Treatment sessions lasted 30 minutes each for 10 consecutive sessions (three sessions per week). Throughout each treatment session, gradually raise the ST device's intensity every 20 seconds until the patient experiences some sensations but none that are uncomfortable or painful [9]. The patient also underwent the following exercises: core stability exercises, pelvic bridging, posterior pelvic tilting, and self-stretching of the thoracolumbar fascia. Each exercise treatment session lasted for 20 minutes [11]. No adverse event was recorded for the patient. A 10-cm VAS scale, which has great validity and reliability in quantifying pain intensity, was used to evaluate the degree of pain [12]. Functional impairment was assessed using the Oswestry Disability Index (ODI). A self-report questionnaire with ten questions reflecting various motor functions and a score range of 0 to 50 that is multiplied by two was used to determine the percentage of functional impairment (0% to 100%) [13]. The lumbar joint range of motion (flexion and extension) was assessed using the modified Schober test. The test has excellent validity and reliability to measure the lumbar joint range of motion [14].

The VAS score decreased from 7.5 cm to 1.5 cm, Oswestry Disability Index 50% to 12%, and increased lumbar range of motion (flexion 45mm to 68 mm and extension 21 mm to 32 mm) after 10 sessions of treatment.

Figure 1) Electrode placement for Scrambler Therapy

Discussion

Persistent pain substantially impairs quality of life and has a detrimental impact on an individual's bio-psycho-social aspects of health [1]. So, the most cutting-edge, effective, and novel type of treatment, such as ST therapy, appears to enhance the management of chronic pain [8]. Scrambler Therapy is a non-invasive neuromodulation device in which non-pain signals are produced from artificial neurons and transmitted via ascending fibers by stimulating the body using EKG electrodes and re-modulation of pain as "non-pain information" to the brain, known as bio-cybernetics principles [8]. After 10 therapy sessions, we saw considerable improvement in our patient's pain (VAS decreased from 7.5 to 1.5) and functional impairment (ODI decreased from 50 to 12). A study conducted in our neighboring country of Nepal showed that six sessions of ST therapy reduced pain intensity from a mean VAS of 8.12 to 3.62 and improved functional impairment from a mean ODI of 49.87 to 18.44 [10]. After a 3-week follow-up, randomized, sham-controlled research among CLBP responders who had undergone ST therapy for 10 sessions appeared to exhibit considerably less pain interference and severity [9].

After 10 sessions of therapy, we saw an improvement in the lumbar range of motion in our case study. Similar findings were seen in randomized controlled research by Tantawy et al., who found that therapeutic exercise and interferential treatment dramatically enhanced lumbar ROM in individuals with CLBP [11].

Conclusion

Our case study revealed that the ST device, a fully automated multiprocessor medical device, helps reduce chronic low back pain, lowering functional impairment and enhancing lumbar range of motion in CLBP patients. To evaluate its efficacy and effectiveness, further randomized controlled studies on individuals with CLBP are required.

Authors' contribution

Conceptualization, MJI., and SA.; methodology, MJI., and SA.; software, MJI, and SA.; validation and investigation, MJI., and SA.; KMKI., MAM, formal analysis, MJI., and SA.; writing—original draft preparation, M.J.I., and SA.; writing—review and editing, M.J.I., and S.A.; All authors have read and agreed to the published version of the manuscript.

Conflict of Interest

The authors declare no conflict of interest.

Ethics Approval

Ethical clearance has been obtained from the institutional ethical review board of Sylhet MAG Osmani Medical College Hospital. Written informed consent was obtained from the patient for publication of this case report and accompanying images.

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