

# Effects of Therapy in Patients Suffering from Chronic Back Pain Treated with Spinal Cord Stimulation

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## ■ ABSTRACT:

Pain in the lumbosacral part of the spine in the course of degenerative disease is the most common cause of physical activity limitation in adults. Treatment includes pharmacotherapy, physiotherapy, psychotherapy, health promotion, and sometimes surgery. Surgical treatment is not always successful, and the various clinical and psychosomatic symptoms that result from surgical treatment failure are known as failed back surgery syndrome. For some patients with this condition, spinal cord stimulation can provide relief. The aim of the work was to define subjective and objective spinal cord stimulation effects by assessing chosen disability and physical activity limitation ratios. Pain intensity, level of disability, and presence of neurological symptoms were assessed. The examination was performed twice: before the stimulator implantation and at least 6 months postimplantation. The study was conducted at the Department of Neurosurgery and Paediatric Neurosurgery in Lublin. Thirty-six patients suffering from failed back surgery syndrome were recruited for this study. The Visual Analog Scale, modified Laitinen's pain questionnaire, and Oswestry Disability Index were used in this work. The study showed that spinal cord stimulation was effective in treating spinal and lower limb pain in 64% of patients, similar to results obtained in other departments. Although back pain and neuropathic pain radiating to the lower limbs decreased, moderate physical activity impairment was still observed according to the Oswestry Disability Index scale. The decrease in neuropathic pain radiating to the lower limbs had the most significant influence on reducing physical activity impairment.

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## BACKGROUND

Back pain resulting from degeneration of the spine is one of the most frequent conditions affecting adults today. Disorders of the lumbosacral part of the spine are the most common causes of physical activity limitation in adults and one of the main reasons for absences from work (Andersson, 1999; Maniadakis & Gray, 2000). It is estimated that 60%-80% of the adult population suffer from this kind of pain (Hoy, Brooks, Blyth, & Buchbinder, 2010). Cases of reported back pain require careful diagnostic testing, thorough risk factor analysis, and adequate therapy. Treatment for back pain includes pharmacotherapy, physiotherapy, psychotherapy, health promotion, and—if these means turn out to be insufficient (e.g., there are symptoms of neurological disorders or the pain is unbearable)—surgery (Krasucki, 2005). The percentage of patients whose back pain is treated surgically varies across countries, ranging from 0.4% to 2.2% (Andersson, 1999). Surgery will not solve all of a patient's medical issues; it is still necessary to introduce a secondary prevention program and lifestyle changes (Krasucki, 2005). The outcome of therapy is also influenced by how well the back pain risk factors can be controlled and active cooperation of the patient (Slade & Molloy, 2009).

Surgical treatment is associated with a risk of failure. It is estimated that 8% to 25% of operations to relieve back pain do not result in satisfactory outcomes (Rutkowska, 2004; Taylor, Van Buyten, & Buscher, 2005; Wetzel & LaRocca, 1991). These patients require further treatment, often another (and sometimes multiple) surgical intervention. The various clinical and psychosomatic symptoms that result from the failure of surgical treatment are defined as failed back surgery syndrome (FBSS) and post-laminectomy syndrome. Chronic pain, which is the main component of FBSS, limits a patient's participation in normal life activities and causes serious disability. Spinal cord stimulation (SCS) is, for a small group of these patients (qualification criteria are fulfilled by about 5% of patients), a chance to improve their quality of life (Kumar, Hunter, & Demrtia, 2006).

## AIM OF THE STUDY

The aim of this work is to assess the effectiveness of SCS in subjective (chronic pain treatment) and objective (chosen disability and activity limitations ratios) categories for this particular group of patients. Recognition of these limitations also allows us to better define the aims of functional improvement therapy for physiotherapists as well as for patients.

## MATERIALS AND METHODS

Thirty-six patients treated with SCS in the Department of Neurosurgery in Lublin from 2008 to 2013 took part in the study. The group consisted of 20 women and 16 men aged 43 to 80 years (mean age  $59.61 \pm 9.36$  years). Patients qualified for SCS after failed surgery on the lumbar part of the spine (from 1 to 8 operations). Pharmacotherapy and physiotherapy were also insufficient in treating chronic pain in the course of degenerative disease.

Patients were qualified for stimulator implantation after taking their medical history, a clinical examination, and medical imaging (CT or MRI) examination. Patients with active psychiatric disorders, severe depression, hypochondriac behaviors, and histories of drug and alcohol abuse were excluded from the study. Patients' state assessments also included clinical examination in order to determine the pain intensity and level of disability caused by FBSS. In this study the following methods were used:

- Visual Analog Scale (VAS) according to Huskisson (1982)—type and intensity of pain of the lumbar part of the spine as well as neuropathic pain radiating to the lower limbs were assessed, scoring from 0 (no pain) to 10 (unbearable pain)
- Pain assessment modified scale according to Laitinen (1979)
- Oswestry questionnaire (Oswestry Disability Index [ODI])—this scale consists of 10 questions concerning pain intensity, self-care, lifting, walking, sitting, standing, sleeping, sexual activity, social life, and travelling. The patient was to choose the answer that best reflected his or her situation; point values for each question range from 0 to 5, for a possible maximum score of 50. Point totals were converted to percentages (1 point = 2%). On the basis of this questionnaire, five degrees of life quality impairment are determined: 0%-20%, no disability; 21%-40%, slight disability; 41%-60%, moderate disability; 61%-80%, serious disability, with pain affecting all aspects of life; 81%-100%, complete disability, patient is bedbound (Niskansen, 2002).

All examinations were performed twice: before the implantation and at least 6 months postimplantation.

## RESULTS

Patients were treated symptomatically and surgically because of pain and limitations resulting from degenerative disease of the spine. Twenty-three patients had been diagnosed with chronic comorbidities: hypertension (23), diabetes (7), and chronic obstructive pulmonary disease (4). A majority of the group (30 patients [83.3%]) were professionally inactive because of poor health and age. Between 2

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