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Title
Severe Central Neuropathic Pain Relieved by Deep Brain Stimulation – a Case Study

Abstract
Objective: Central neuropathic pain (CNP) is a serious problem after spinal cord injury (SCI) that is particularly refractory to treatment. Although both pharmacological and non-pharmacological approaches may reduce the severity of CNP, pain relief is rarely substantial. Thus, more effective management of CNP is urgently needed. The objectives of the present case study were to determine the effect of deep brain stimulation (DBS) on: (1) SCI related CNP severity and impact; and (2) pain related sensory function.

Design/Method: One-year case study of a 54-year-old woman with incomplete paraplegia (T11/T12, ASIA B) who sustained electrocution injuries 30 years prior to study. At baseline, she reported constant and severe CNP in lower limbs and buttock areas present since shortly after her injury, and thermal and mechanical allodynia in the painful limbs. Electrodes were implanted in the anterior periaqueductal gray (PAG) and in the periventricular gray (PVG) at study week 8. DBS parameters were adjusted during the course of study to optimize pain relief. Pain outcomes (International SCI Pain Basic Data Set, Neuropathic Pain Symptom Inventory, and Quantitative Sensory Testing) were evaluated at baseline and study weeks 20, 32, and 52.

Results: After starting DBS treatment (week 8), CNP severity rapidly decreased from severe to minimal, paralleled by a substantial reduction in the painful area. There was also a reversal of dynamic mechanical and cold allodynia in the painful area. The improvement lasted the entire study period and she discontinued pain medication (pregabalin, 75 mg/day) by study week 24. She described the impact of the treatment in these words: “It's a whole new world. It's like, Wow! You know]”

Conclusion: The results of this study suggest that activation of PAG/PVG endogenous pain inhibitory systems can inhibit the mechanisms underlying both CNP and associated sensory dysfunction.

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Contact Name: Eva Widerstrom Noga
Contact Email: EWiderstrom Noga@med.miami.edu

Objective 1. Summarize the effects of deep brain stimulation (DBS) in one person with SCI related central neuropathic pain.

Presenters Listed
Eva Widerström Noga,1,2,4 D.D.S., Ph.D.; James Adcock,1,4 Ch.E., M.B.S.; Maydelis Escalona,1,4 B.S.; Letitia Fisher,1,4 B.S.; Jonathan R. Jagid,1,4 M.D.; Corneliu C. Luca,3,4 M.D.; Alberto Martinez Arizala,1,2,3,4 M.D.; Alberto Vitores,1,4 B.S.; D. Hentall,1,2,4 Ph.D.

1The Miami Project to Cure Paralysis, Miller School of Medicine, University of Miami, Miami, FL; 2 Department of Neurological Surgery, Miller School of Medicine, University of Miami,
Participants
Eva Widerstrom Noga, D.D.S., Ph.D.

Bio

Education
University of Göteborg, Sweden 1986 D.D.S. (Dental Surgery)
University of Göteborg, Sweden  1993  Ph.D. (Pain Physiology, Pain Psychology)

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NonFinancial Disclosure: Dr. Eva Widerstrom Noga has no relevant nonfinancial relationships to disclose.