

High frequency spinal cord stimulation as a treatment of failed back surgery syndrome

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Introduction and objectives

In the Netherlands, high frequency spinal cord stimulation (HFSCS) has been used to treat patients with failed back surgery syndrome (FBSS) since 2010. The advantages of treatment with high frequency spinal cord stimulation compared to conventional spinal cord stimulation (CSCS) could be the absence of paresthesia and a higher effectiveness for the treatment of backpain. Little is known about the effectiveness of HFSCS, particularly in patients that failed treatment with CSCS. This study was conducted to assess the effectiveness of HFSCS for the total research group and also for patients that failed CSCS prior to treatment with HFSCS. Furthermore, the aim was to determine factors that have a predictive value for an effective treatment.

Methods

A retrospective study was conducted on 53 patients with FBSS in whom a Senza[®] battery was implanted prior to November 2013 in three Dutch hospitals (Albert Schweitzer Hospital, Maastad Hospital and Rijnstate Hospital). Pain scores on a 0 to 10 point scale prior to implantation, at the end of a trial period, at short-term and at long-term after implantation were collected. Also a set of patient characteristics and result of psychological questionnaires prior to implantation were collected. The percentage of patients in which HFSCS was effective (≥ 30 percent pain reduction or ≥ 2 points reduction in pain score) was assessed and factors that have a predictive value for an effective treatment were determined.

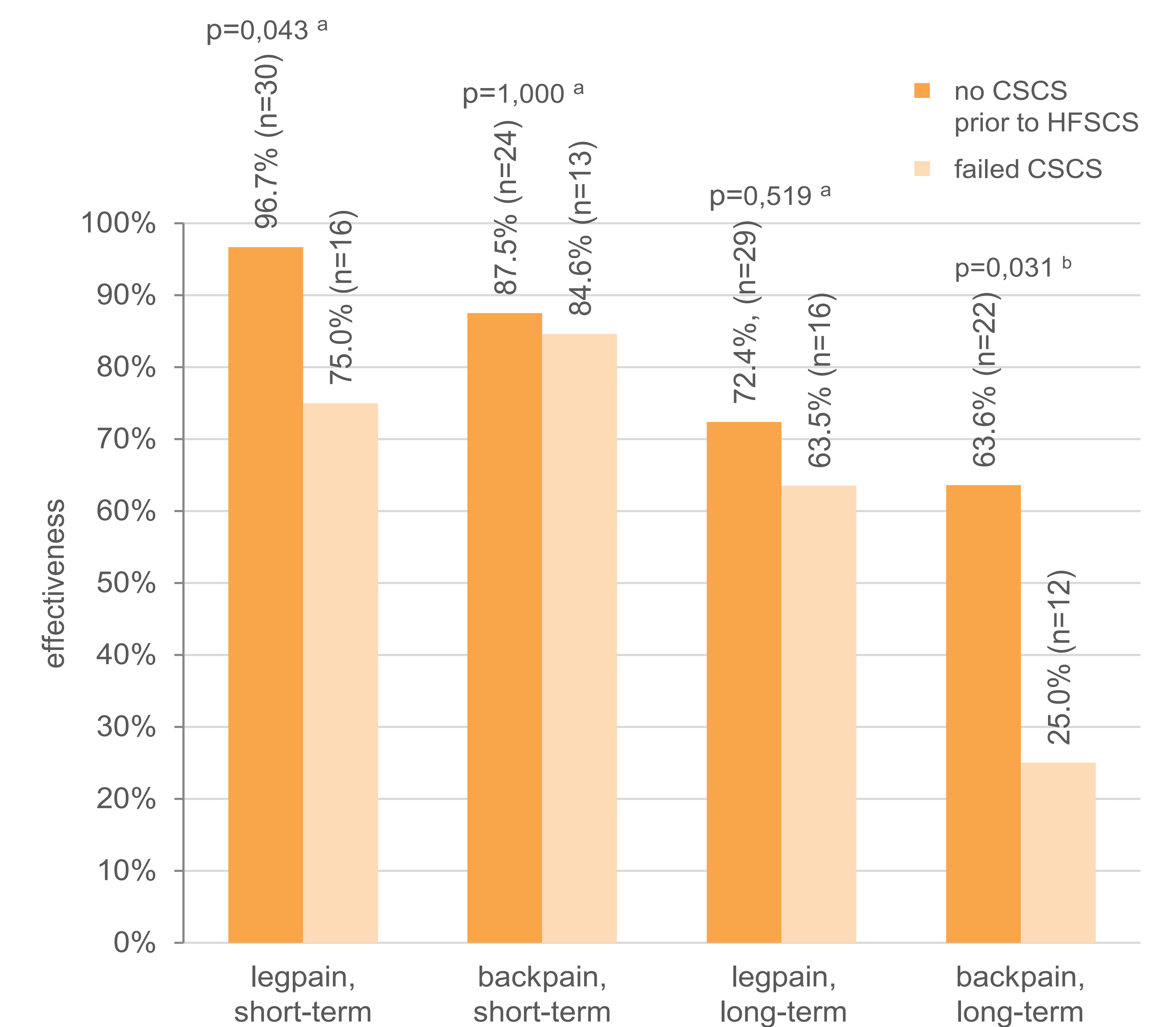
Results

The long-term (2-24 months after implantation) effectiveness of HFSCS was 68,9% for legpain and 50,0% for backpain. Average long-term pain scores for legpain and backpain were lower than average baseline pain scores ($p < 0,001$). The average long-term reduction in pain score was 3,5 points for legpain and 2,3 points for backpain. The effectiveness of HFSCS on backpain is higher in patients who did not fail CSCS prior to treatment with HFSCS ($p = 0,031$) (Figure 1). The effectiveness of the therapy was higher in patients that had a trial period of one week or shorter ($p = 0,022$, OR=5,8) and in patients that had a pain score in the trial period lower than 1,6 points ($p = 0,040$, OR=25,6).

Conclusion

HFSS is an effective therapy for patients with FBSS, especially for legpain in patients who did not fail CSCS prior to treatment with HFSCS. The therapy is most effective on long-term in patients that report low pain scores in a short trial period. A thorough evaluation of the trial period can increase the effectiveness of HFSCS as a treatment of chronic pain in patients with FBSS.

Figure 1: Effectiveness of HFSCS



^a Fisher's exact test

^b Pearsons chi square test