Pain therapy with Spinal Cord Stimulation (SCS): patient characteristics and healthcare cost implications comparing early and late therapy start

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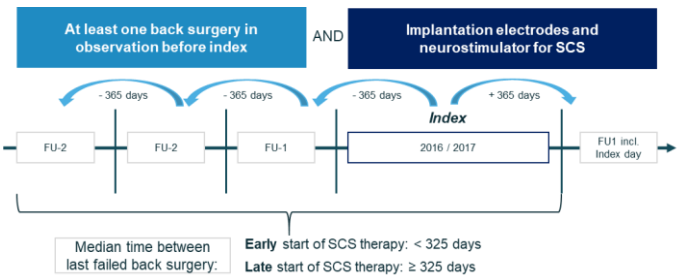
Objective

Approx. 19% of European adults [1] suffer from chronic pain, a condition which heavily impacts quality of life for patients, often leads to inability to work, and is associated with high costs for health insurances. When conservative treatment and back surgery fail, Spinal Cord Stimulation (SCS) with an implanted neurostimulator [2] is currently often a second-line treatment option to reduce pain. The aim of the study was to identify characteristics and healthcare costs of patients who received SCS therapy and compare those for patients with an early vs. a late start of the SCS therapy.

Methods

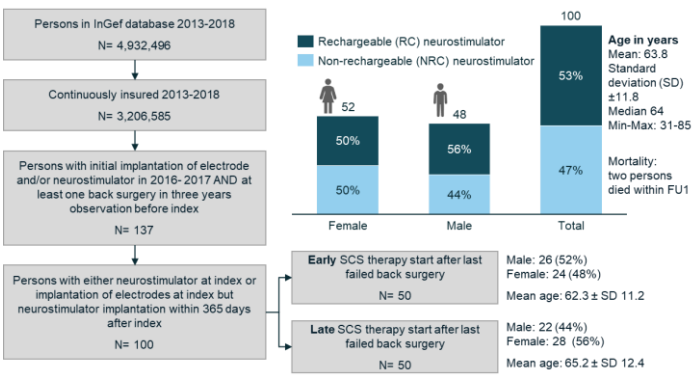
A retrospective analysis based on German statutory health insurance (SHI) claims data was conducted within the InGef research database, which represents a 5% representative and anonymized sample of the German population [3].

Figure 1: Indexing and observation period



Patients with SCS therapy were identified upon implantation of electrodes and neurostimulator in 2016 or 2017. They were observed for the three years leading up to the implantation (FU-3, FU-2, FU-1), during which they must have had at least one failed back surgery, and for one year of follow-up (FU1). Patients with neurostimulator usage before index were excluded to derive a population of patients with initial SCS therapy. Patients must have been continuously insured during observation to avoid loss to follow-up.
Patients were stratified in two equal groups based on the median number of days between last failed back surgery and SCS therapy ('Early SCS': >325 days vs. 'Late SCS': ≥325 days), *see figure 1*.
Data on a previously published SCS population (analyzed in the same database) [4] with three years FU after SCS therapy was used to compare rechargeable (RC) and non-rechargeable (NRC) neurostimulators.

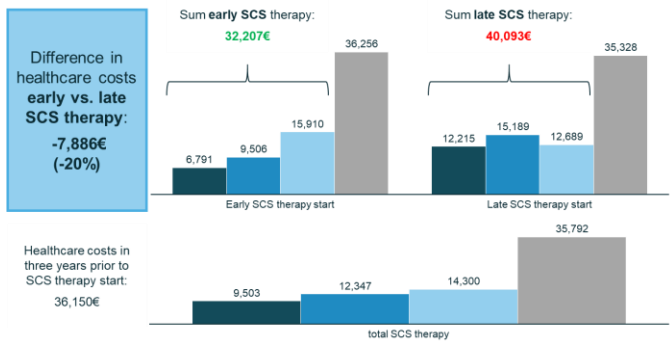
Figure 2: Patient flow and patient characteristics at index



Results

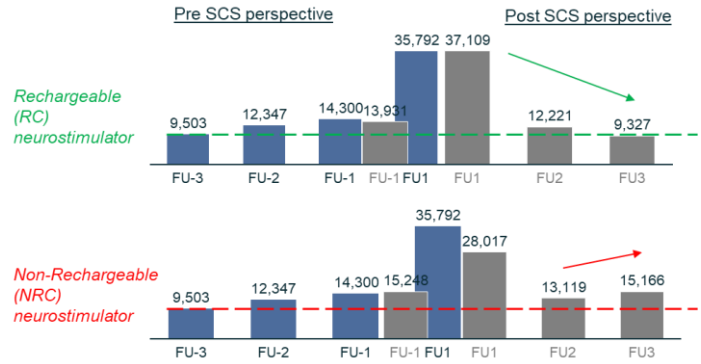
Overall, 100 patients were identified with initial SCS usage after failed back surgery, *see figure 2*. Around half were male (48%) and half were female (52%). Patients were on average 64 years old. There were slightly more patients using rechargeable (RC) neurostimulators than non-rechargeable (RC) (53% vs 47%). Stratified by time between last failed back surgery and SCS start, 50 of patients were categorized having an early SCS start and 50 as having a late SCS therapy start. Age and sex distribution was similar within the groups.

Figure 3: Average healthcare costs [€] per patient during observation



Average healthcare costs per patient increased within the years leading to SCS therapy from €9,503 to €14,300 and reached their peak in the year of SCS therapy start at overall €35,792. This amounted to a total of 36,150€ costs for the three years prior to SCS therapy start. While patients with early SCS therapy showed in total €32,207 in this timespan, costs for patients with late therapy start were at €40,093 healthcare costs prior to SCS therapy. Hence, patients with an early therapy start showed €7,886 (-20%) lower healthcare costs in comparison to those with a late therapy start, *see figure 3*.

Figure 4: Comparison of healthcare costs [€] three years before and after SCS therapy



Combining healthcare costs of SCS therapy three years before index to previously published healthcare costs three years after index [4], stratified by RC and NRC, a general increase in healthcare costs before SCS therapy and a decrease after SCS therapy start was found.
Patients with an RC neurostimulation showed an overall steady decrease in healthcare costs after implantation resulting in annual costs even lower than 3 three years prior to SCS therapy start. Patients with an NRC neurostimulation on the other hand also showed a decrease in costs. Two years after implantation, however, an increase in costs was seen again , *see figure 4.*

Conclusion

Patients with an early therapy showed notably lower healthcare costs (-20%) in three years prior to SCS therapy than those with a late SCS therapy start. Comparing healthcare costs after SCS therapy, rechargeable neurostimulators seemed to be superior to non-rechargeable neurostimulators based on their steady decrease in costs three years after SCS therapy [4].Therefore, early SCS therapy using rechargeable neurostimulators in patients with chronic pain and failed back surgeries suggests benefits for both patient and payer perspective.

References:
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Author contributions: This analysis was financed by Nevro Corp. and carried out and evaluated by HGC Healthcare Consultants GmbH, the University of Applied Sciences Niederrhein and the Institute for applied health research (Institut für angewandte Gesundheitsforschung GmbH (InGef). Dr. Luecke is employed at the Franziskus Hospital in Linz. He is active in advisory for Nevro Corp. and the centre for second medical opinion of the statutory health insurance. Dr. Jähnichen is employed at the Roland hospital in Bremen and is active in advisory for Nevro Corp. Berit Libutzki, Vincent Straub and Dr. Christoph Bischoff-Everding are employed at HGC Healthcare Consultants GmbH. Harald Kuhlmann is employed at inspiring health GmbH and was previously employed by Nevro Corp.