



The Clinical and Economic Impact of TENS in Patients with CLBP: A Long-Term Retrospective Database Study

Michael E. Minshall, MPH, Abhishek Chitnis, MS, Michael Stokes, MS, Veronica Alas, PhD, Luke Boulanger, MA, MBA, Elyse Gatt, BA, Robert Pivec, MD, Baltimore, Maryland, Michael A. Mont, MD, Baltimore, Maryland

Abstract:

Introduction

The prevalence of chronic low back pain (CLBP) has been estimated to affect 30% of the United States population, with total annual costs estimated at \$86 billion. Numerous non-operative treatment modalities exist for isolated low back pain, one of which is transcutaneous electrical nerve stimulation (TENS). Prior published reports have reported mixed results regarding the efficacy of TENS for this application. However, there have been only a few studies that have evaluated healthcare resource use and costs associated with TENS therapy. The purpose of this study was to use a nationwide database to evaluate both the costs and resource use associated with treating CLBP patients with TENS.

Methods

The costs and clinical impact of TENS compared with other treatment modalities, using data collected between 2008 and 2010 from commercial and Medicare supplemental administrative claims databases (Truven Health Analytics MarketScan™), were studied. Patients were selected if they had at least two ICD-9-CM coded claims for low back pain in a three month period and were then propensity score matched at a 1:1 ratio between patients who received TENS and those who did not (22,913 patients in each group). There were no demographic differences in the two groups, with the exception that patients who were treated with TENS had evidence of more severe disease prior to any intervention. The minimum length of follow-up from the database was two years which incorporated outcomes data prior to the intervention as well as one year post-intervention. Major endpoints evaluated were differences between the two groups on total costs, incidence of subsequent back surgery, need for further imaging, subsequent medical resource utilization (e.g. physical therapy visits or emergency room visits), and rate of opioid use. Means were compared using a Wilcoxon Rank-Sum test and a p-value of 0.05 was used as the threshold to determine statistical significance.

Results

CLBP patients who were treated with TENS had significantly lower rates of back surgery, medical imaging, physical therapy visits, emergency room visits, and opioid prescriptions than patients who were not treated with TENS after 1 year of follow-up (all p < 0.01; Table 1). The total per-patient costs for TENS were \$81 lower compared to patients who did not receive TENS (\$18,228 vs. \$18,309, respectively, p<0.0001).

Discussion and Conclusion

Patients who had documented low back pain and were treated with TENS demonstrated reduced utilization of back surgery, imaging, physical therapy visits, ER visits, and opioid therapy when compared to patients who were not treated with TENS. This is despite the TENS cohort having evidence of more severe disease prior to any intervention being performed. Patients receiving TENS also had significantly lower costs, although the magnitude of the difference may not be clinically pertinent. This treatment option may be a useful adjunct for the orthopedic surgeon who would like to offer his or her patients non-opioid forms of analgesia.

Number of Events per Year in CLBP: Non-TENS vs. TENS

Event	Number of Events/Year in non-TENS Group	Number of Events/Year in TENS Group	Incremental Differences	p-value
Back Surgery	0.092	0.075	0.018	p<0.0001
Imaging	0.460	0.314	0.146	p<0.0001
Physical Therapy	10.652	9.385	1.267	p<0.0001
ER Visits	0.538	0.505	0.033	p<0.0027
Opioid Use	4.086	3.882	0.204	p<0.0001

Empi, Inc. | A DJO Global Company

T 800.328.2536 D 651.415.9000

205 Highway 22 East | Clear Lake, SD 57226 | U.S.A.

Empi.com

