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Utilization Rates of Transcranial Electric Motor Evoked Potential (tceMEP) Monitoring During Extradural Cervical, Thoracic and Lumbosacral Spine Surgery in Large and Small Centers

RESEARCH ABSTRACT

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Objective

Quantify utilization of tceMEPs during multimodality intraoperative neuromonitoring (IONM) of cervical, thoracic, and lumbosacral spine surgery. Determine if utilization is higher in larger than smaller centers.

Background

Multimodality IONM is gaining acceptance as a method of monitoring neural function during spine surgery. Complementing somatosensory evoked potentials and electromyography, tceMEPs expand surveillance to vulnerable central and peripheral motor pathways. However, minimal data exist about tceMEP utilization during surgery in different spine regions and external factors such as hospital size, which may influence adoption of the technique.

Design/Methods

A retrospective review of a multi-institutional database of 64,519 consecutive extradural spine procedures monitored from May 2013 through August 2015 was performed. Multiple comparisons of tceMEP utilization rates using logistic regression and post-hoc Tukey contrasts were used to compare tceMEP utilization during cervical, cervicothoracic, thoracic, thoracolumbar, and lumbosacral spine surgery, and utilization in larger (>300 beds) versus smaller (≤300 beds) facilities.

Results

Collapsing large and small centers, tceMEP utilization rates ranged between 88.9% and 87.7% for surgery in the cervical and/or thoracic spine, dropping to 26.1% for procedures confined to the lumbosacral region. Larger centers used tceMEPs more frequently than smaller centers in comparisons within each spinal region. This difference was greatest for lumbosacral procedures where rates in larger and smaller centers were

33.1% and 17.6%, respectively. Differences in utilization were all significant at the $p < .001$ level, save for the thoracolumbar region in which the difference between larger and smaller centers was significant at $p = 0.03419$.

Conclusions

TceMEPs are commonly used during multimodality IONM of cervical and thoracic spine surgery. Lower rates of utilization during lumbosacral procedures may reflect lack of scientific consensus on tceMEP sensitivity for detection of nerve root injury. Higher utilization in larger centers may be related to associated factors such as experience of surgical and anesthesia personnel with the potential value of the technique.