

Predictive Value of Intraoperative Neurophysiological Monitoring in Patients With Normal and Abnormal Baseline Recordings During Spine Surgery

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Introduction

We sought to delineate if having baseline deficits on preoperative recordings increased the predictive value of detecting a new neurodeficit with intraoperative neurophysiological monitoring.

Methods

Analysis of a consecutive series of patients who underwent spine surgery with neurophysiological monitoring during a 3-year period at a university hospital. Sensitivity and specificity were determined using Bayesian techniques. There were 1652 (65.3%) patients with abnormal baseline recordings and 2530 (60.5%) patients with normal baseline recordings. Impact of length of surgery & of variables including age, sex, BMI, DM, HTN, CAD, CVD & history of smoking, on the development of a new neurodeficit was defined.

Results

Seventy (4.2%) & 53 (2.1%) new neurodeficits occurred in patients with abnormal & normal baseline recordings respectively. The OR for developing a new neurodeficit in patients with pre-operative abnormal readings was 2.06 ($p < 0.001$, CI 95% 1.42%-3.02%). Intraoperative monitoring had a sensitivity of 17% and specificity of 89% in predicting a postoperative neurodeficit in patients with abnormal baseline recordings. In patients with normal baseline recordings this sensitivity and specificity increased to 24.5% and 92.2% ($p = 0.35$). Neither the length of surgery nor did any analyzed patient related variable have a statistically significant impact on the development of a new neurodeficit.

Conclusions

The odds of developing a new neurodeficit are higher in patients with abnormal baseline recordings. Robust baseline recordings increase the sensitivity and specificity of the IOM to predict a new neurodeficit.

Learning Objectives

By the conclusion of this session, participants should be able to define if preoperative abnormal SSEP recordings portend bad prognosis for patients undergoing elective spine surgery. Participants should also be able to define the role of intraoperative monitoring and their positive and negative predictive values to detect a postoperative neurodeficit.