

Diagnostic Value of Somatosensory Evoked Potential (SSEP) Changes During Carotid Endarterectomy: A Systematic Review and Meta-analysis

Enyinna Levi Nwachuku MD



Introduction

Perioperative stroke is a persistent complication of carotid endarterectomy (CEA) for patients with symptomatic carotid stenosis (CS). Our primary aim is to evaluate whether changes in somatosensory evoked potential (SSEP) during CEA are diagnostic of perioperative strokes in patients with symptomatic CS.

Methods

Authors searched Pubmed/MEDLINE and World science database for reference lists of retrieved reports and/or experiments from January 1950 through January 2013 for studies on SSEP use for post-operative outcome after CEA for symptomatic CS. The inclusion criteria were: Randomized controlled trials, prospective, or retrospective cohort reviews; Population of symptomatic CS; Utilization of intraoperative SSEPs monitoring during CEA; Immediate post-operative assessment and/or up to 3 month follow-up; Total sample size = 50 patients; Studies with adult humans, = 18 years of age; Studies published in English.

Results

464 articles were retrieved. A mixture of 15 prospective and retrospective cohort studies remained for data analysis. A 4557 patient cohort encompassed the total sample population for all the studies, 3899 of which had symptomatic CS. SSEP change exhibited strong pooled average specificity 91% [86%, 94%] but a weaker pooled average sensitivity of 58% [49%, 68%]. A pooled diagnostic odds ratio for individual studies of patients with neurological deficit with changes in SSEPs was 14.39 [8.34-24.82], indicating that the odds of observing an SSEP change among those with neurologic deficit are 14 times higher than those without neurologic deficit.

Conclusions

Intraoperative SSEP is a highly specific test in predicting neurological outcome following carotid endarterectomy. Patients with perioperative neurological deficits are 14 times more likely to have had changes in SSEPs during the procedure. The utilization of SSEPs to design prevention strategies can prove valuable in reducing perioperative cerebral infarctions during CEA.

Learning Objectives

1. Effectiveness of SSEP in predicting post-operative outcome in patient undergoing carotid endarterectomy for symptomatic carotid stenosis.
2. Validity of SSEP in comparison to EEG assessing outcomes post-endarterectomy

[Default Poster]