

Introduction

Cognitive outcomes following brain surgery are an important component of quality of life (QOL) and long-term functional status. Increasingly, emphasis is placed on outcome measures to assess surgical quality. Postoperative cognitive status provides an objective, interrogable endpoint for clinical use. Despite this, information on postoperative cognitive outcomes of brain tumor patients remains sparse, and postoperative assessment of cognitive status is not part of routine follow-up care in these patients. Here we analyze and compare the quality of neuropsychological tests used in the assessment of postoperative cognitive outcomes of brain tumor patients.

Methods

Tests were included if they had evidence of being used to assess cognition in brain tumor patients following surgical tumor resection. PubMed and PsychInfo were queried for all publications related to cognitive outcomes in brain tumor patients, yielding 28 tests. To allow comparisons and determine relative value, specific quality variables for each test were investigated: number of cognitive domains assessed, depth of each domain, time to administer, performance compared to other tests, and objective efficacy measures including sensitivity, specificity, PPV, NPV and ROC AUC.

Results

Among 28 tests analyzed, the modified mini-mental state exam, Addenbrooke's Cognitive Exam – Revised, and the Neurobehavioral Cognitive Status Exam scored highest in our assessment. Each scored highly in objective efficacy measures, covered a broad range of cognitive domains, and was widely accepted in the medical community. When compared to other tests considered, these three returned greater sensitivity/specificity and lower false negative rates for detecting cognitive impairment.

Conclusions

Neuropsychological testing should be a routine part of outcome tracking. We recommend these tests be incorporated into standard outcome tracking for brain tumor patients following surgery to better capture this important aspect of postoperative functional status and QOL. Future research may utilize cognitive outcome data to compare surgical approaches, identify best practices, and improve patient outcomes.