Predictors of Angiographic Obliteration in Acute Subarachnoid Hemorrhage Aneurysms

Richard T. Dalyai MD; Jeffrey Landy BS; David Boorman; Nohra Chalouhi MD; Mario Zanaty MD; Saurabh Singhal; George M. Ghobrial MD; Pascal Jabbour MD; Robert H. Rosenwasser MD, FACS, FAHA; Stavropoula I. Tjoumakaris MD

Introduction

Subarachnoid hemorrhage is a well-known disease that can have neurologically devastating outcomes. Less understood are those variables that contribute to angiographic outcome.

Methods

We studied a total of 491 patients, from 2007 to 2011 at a single neurovascular center with the diagnosis of SAH and an aneurysmal source identified on diagnostic cerebral angiography. Patients' aneurysms were treated with endovascular occlusion or craniotomy for clip ligation at the discretion of the treating physician. All charts were reviewed for clinical presentation, past medical history, laboratory values, surgical procedures, radiographic obliteration, and clinical outcome at discharge. Univariate analysis was used to test covariates collected by the time of aneurysm treatment that were predictive of angiographic obliteration between 6 months and 5 year follow up.

Results

There were 425 aneurysms (86%) were located in the anterior circulation while 66 were located in the posterior circulation. 322 patients (65%) were Hunt and Hess(HH) grade 3 or greater while 169 patients (34%) were HH grade 1 or 2. Univariate predictors of obliteration ($p<0.05$) were : patients who did not undergo decompressive hemicraniectomy($p=0.004$), patients without delayed ischemic neurologic deficits($p=0.013$), admission GCS of 15 ($p<0.001$), decreasing aneurysm size ($p=0.018$), younger age ($p<0.001$), pH between 7.35 and 7.45 (0.005), and increasing GCS on discharge (0.001).

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the predictors of angiographic obliteration and identify an effective treatment for a SAH.

Conclusions

We report that the most significant factors predicting angiographic obliteration are decreasing age ($p<0.001$), GCS 15 on admission ($p<0.001$), pH 7.35-7.45 (0.014), and smaller aneurysms (0.048).