

Early predictors of outcome in aneurysmal subarachnoid hemorrhage patients: Analysis medical and surgical variables of 252 patients

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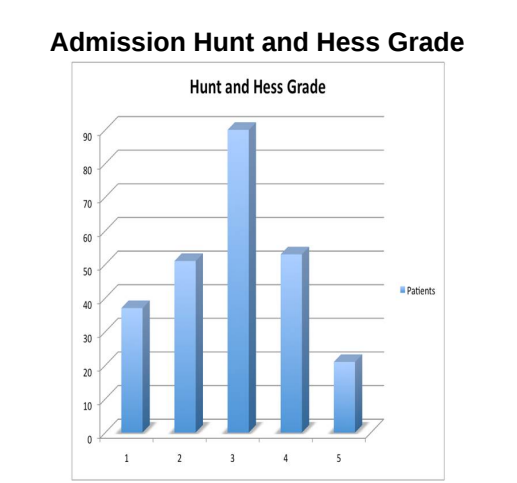
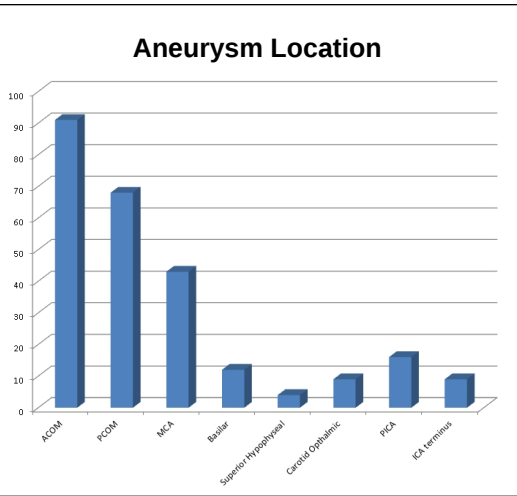


Introduction

Subarachnoid hemorrhage is a well known disease that can have neurologically devastating outcomes. Less understood are those initial medical and surgical variables that contribute to their neurologic outcome.

Methods

We studied a total of 252 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. Ordinal logistic regression analysis was used to test covariates collected by the time of initial aneurysm treatment that were predictive of discharge GCS. Multivariate analysis was carried out to determine predictors of favorable discharge outcome.



Conclusions

We report that the most significant factors predicting early favorable outcome are decreasing age ($p<0.001$), lower hunt hess ($p<0.001$), pH 7.35-7.45 (0.014), and presence of early infarct on CT (0.048). Type of aneurysm treatment (clip/coil) was not predictive when controlling for the above.

Results

There were 202 patients younger than 65(80%), while 50 patients were older than 65. 156 aneurysms (61%) were located in the anterior circulation while 96 were located in the posterior circulation or posterior communicating segment. 164 patients (65%) were Hunt and Hess(HH) grade 3 or greater while 88 patients (34%) were HH grade 1 or 2. Univariate predictors of favorable outcome (increasing GCS at discharge) ($p<0.05$) were : decreasing age ($p<0.001$), no external ventriculostomy ($p<0.001$), elevated admission GCS ($p<0.001$), decreasing Hunt Hess ($p<0.001$), euthermic temperature ($p=0.024$), increasing FI02 ($p<0.001$), decreasing a-a gradient (0.05), pH between 7.35 and 7.45 (0.008), increasing O2 ($p<0.001$), white blood count less that 12 (0.007), and normal albumin levels (0.041).

Surgical Treatment	
Surgical Variable	Patients
EVD	162 (64%)
VPShunt	55 (21%)
Decompressive Craniectomy	33 (13%)
Angioplasty for Vasospasm	23 (9%)
Coiled initially	190 (75%)
Clipped initially	56 (22%)
Balloon Assist	39 (15%)
Stent Assist	6 (3%)
Aneurysm Recurrences	40 (16%)

Multivariate Analysis of Factors with Increasing GCS on Discharge		
Factor	P Value	95% Confidence Interval
Decompressive Craniectomy	0.033	-1.54- 0.06
Age > 65	< 0.001	-0.06- -0.02
Hunt Hess 3-5	<0.001	-1.067- 0.468
pH > 7.45 or <7.35	0.014	-1.28- 0.14
Early Infarct	0.048	-2.53- 0.01
Type of Treatment	0.84	-0.59- 0.72

