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Impact of preadmission beta blockers and cardiac dysfunction on the incidence of cerebral vasospasm and mortality in aneurysmal subarachnoid hemorrhage

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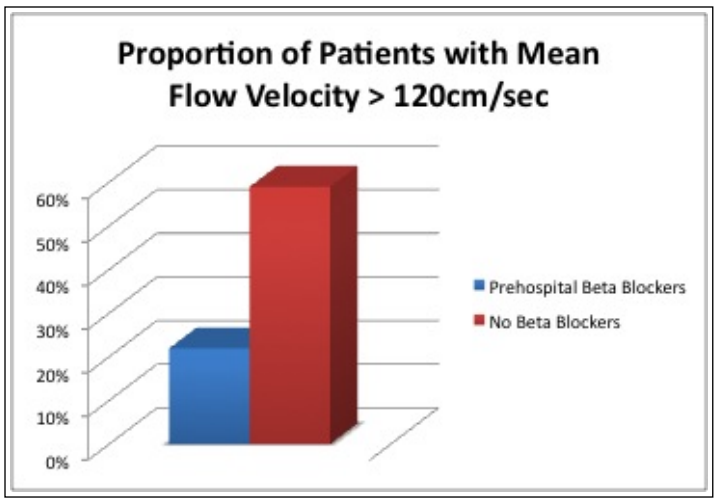
Introduction

Vasospasm is a frequent complication of aneurysmal subarachnoid hemorrhage (SAH), with a significant impact on disease course. The purpose of the present study was to assess the impact of preadmission beta-blockers and cardiac dysfunction on the incidence of vasospasm and mortality following SAH.

Methods

The study population included 210 consecutive patients treated for aneurysmal SAH at Jefferson Hospital for Neuroscience. The occurrence of vasospasm was assessed by serial transcranial Doppler and/or the need for endovascular intervention for medically refractory vasospasm.



Results

The proportion of patients with any mean flow velocity >120 cm/sec was 22% in patients taking prehospital beta-blockers versus 59% in those not taking prehospital beta-blockers (p=0.003). In multivariate analysis, preadmission beta-blockers (OR 4.5; p=0.002) and lower Hunt and Hess grades (OR 3.9; p<0.001) negatively predicted vasospasm. Fourteen patients required an endovascular intervention for medically refractory vasospasm; none were taking prehospital beta-blockers. In multivariate analysis, decreasing ejection fraction (OR 3.9; p=0.05) independently predicted medically refractory vasospasm. The rate of in-hospital mortality was 47.4% in patients with left ventricular motion wall abnormality versus 14.8% in those without (p<0.001). In multivariate analysis, left ventricle motion wall abnormality (OR 2.7; p=0.002) and decreasing ejection fraction (OR 1.1; p=0.05) were independent predictors of in-hospital mortality.

Conclusions

The results of this study suggest that preadmission beta-blockers are associated with decreased incidence of cerebral vasospasm in patients with aneurysmal SAH. Beta-blockers may be a promising therapeutic avenue for vasospasm and may need to be continued/started in patients with SAH. Left ventricular dysfunction was associated with medically refractory vasospasm and in-hospital mortality.

Learning Objectives

1)To describe the relationship between cardiac dysfunction and outcome in the setting of SAH

2) To discuss the relationship between preadmission betablockers and outcomes in SAH

Predictors	OR	P- Value
Pre-admission Beta Blockers	4.5	0.002
Hunt and Hess Grades I/II	3.9	0.001
Decreasing Ejection Fraction	3.9	0.05