

BOC06

October 16, 2012

1:00:00 PM - 3:00:00 PM

Room West Salon G

Beta Blockade and Clinical Outcomes in Aneurysmal Subarachnoid Hemorrhage

Melody M. Chang, M.D., Jessie J. Southerland, M.D., Dare Adewumi, M.D., Rafeek Woods, M.D., Olaide Ajayi, M.D., Rajeev Samuel, B.S., Bryan S. Lee, B.S., Frank Hsu, M.D., Richard L. Applegate, M.D., Ihab Dorotta, M.D.
Loma Linda University Medical Center, Loma Linda, California, United States

Background:

The clinical course of patients suffering from aneurysmal subarachnoid hemorrhage may be complicated by hypertension and neurogenic myocardial stunning. Management of these complications often involves the use of beta blockers. High Fisher grade subarachnoid hemorrhage may also be complicated by cerebral vasospasm, which could have pathophysiologic influence from sympathetic nervous system stimulation or blockade. Currently, the only medication clearly recognized to improve outcomes in subarachnoid hemorrhage is the calcium channel antagonist nimodipine, which improves clinical outcomes but not the incidence of vasospasm. Other agents of interest include anti-inflammatory or vasodilatory agents such as statins, endothelin-1 receptor antagonists, and magnesium.

Methods:

We sought to investigate any relationship of beta blockade to the incidence and severity of radiographic vasospasm in aneurysmal subarachnoid hemorrhage by retrospectively examining 219 adult patients between 8/2004 and 9/2010 who were admitted to the Surgical Intensive Care Units at Loma Linda University Medical Center. Patients were excluded if they expired within 3 days of admission because of inability to assess vasospasm and other outcomes. Three groups were isolated relevant to beta blockade: 77 were never beta blocked (No/No), 123 were started on a beta blocker after admission to the hospital (No/Yes), and 18 were continued on their home beta blockers (Yes/Yes). Records were analyzed for the development of vasospasm with or without resultant infarction, death, and discharge status. Outcomes were evaluated using multivariate analysis through logistic regression and adjusted for potential confounders. Odds ratios for outcomes were calculated setting the odds ratios for No/No patients to 1.

Results:

Patient characteristics are shown in the table. One hundred and forty five patients had vasospasm, 47 consequently infarcted, and 53 died or required care in a long-term facility. The figure shows that patients initiated on beta blockade after admission (No/Yes) had significantly increased radiographic vasospasm [OR 2.11 (1.06-4.16)]. However, despite increased incidence of vasospasm, these patients had significantly fewer deaths or need for long term care [OR 0.17 (0.05-0.64)], with decreased tendency for infarcts [OR 0.70 (0.32-1.55)]. In the population already on a beta blocker (Yes/Yes) during aneurysmal rupture, there was a trend toward increased vasospasm [OR 1.61 (0.50-5.29)] that led to infarction [OR 1.51 (0.44-5.13)], with decreased mortality or need for long term care in a facility [OR 0.13 (0.01-1.30)].

Conclusions:

The use of beta blockers in aneurysmal subarachnoid hemorrhage is associated with increased incidence of radiographic cerebral vasospasm. However, despite the increased rate of vasospasm, the use of beta blockers was associated with improved discharge characteristics.

References:

1. Liang C, et al. J Stroke Cerebrovasc Dis 2011; epub: 1
2. Keyrouz S, et al. Crit Care 2007; 11: 220.