

Subarachnoid Hemorrhage: Medical and Surgical Management (Neurological Disease and Therapy)

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CLINICAL ARTICLE

Beta-blocker therapy and impact on outcome after aneurysmal subarachnoid hemorrhage: a cohort study

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OBJECTIVE Cerebral vasospasm (cVSP) is a frequent complication of aneurysmal subarachnoid hemorrhage (aSAH), with a significant impact on outcome. Beta blockers (BBs) may blunt the sympathetic effect and catecholamine surge associated with ruptured cerebral aneurysms and prevent cardiac dysfunction. The purpose of this study was to investigate the association between preadmission BB therapy and cVSP, cardiac dysfunction, and in-hospital mortality following aSAH.

METHODS This was a retrospective cohort study of patients with aSAH who were treated at a tertiary high-volume neurovascular referral center. The exposure was defined as any preadmission BB therapy. The primary outcome was cVSP assessed by serial transcranial Doppler with any mean flow velocity ≥ 120 cm/sec and/or need for endovascular intervention for medically refractory cVSP. Secondary outcomes were cardiac dysfunction (defined as cardiac troponin-I elevation > 0.05 $\mu\text{g/L}$, low left ventricular ejection fraction [LVEF] $< 40\%$, or LV wall motion abnormalities [LVWMA]) and in-hospital mortality.

RESULTS The cohort consisted of 210 patients treated between February 2009 and September 2010 (85% were women), with a mean age of 53.4 ± 13 years and median Hunt and Hess Grade III (interquartile range III–IV). Only 13% (27/210) of patients were exposed to preadmission BB therapy. Compared with these patients, a higher percentage of patients not exposed to preadmission BBs had transcranial Doppler-mean flow velocity ≥ 120 cm/sec (59% vs 22%; $p = 0.003$). In multivariate analyses, lower Hunt and Hess grade (OR 3.9; $p < 0.001$) and preadmission BBs (OR 4.5; $p = 0.002$) were negatively associated with cVSP. In multivariate analysis, LVWMA (OR 2.7; $p = 0.002$) and low LVEF (OR 1.1; $p = 0.05$) were independent predictors of in-hospital mortality. Low LVEF (OR 3.2; $p = 0.05$) independently predicted medically refractory cVSP. The in-hospital mortality rate was higher in patients with LVWMA (47.4% vs 14.8%; $p < 0.001$).

CONCLUSIONS The study data suggest that preadmission therapy with BBs is associated with lower incidence of cVSP after aSAH. LV dysfunction was associated with higher medically refractory cVSP and in-hospital mortality. BB therapy may be considered after aSAH as a cardioprotective and cVSP preventive therapy.

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KEY WORDS stroke; delayed cerebral ischemia; transcranial Doppler; ultrasound; vascular disorders

Cerebral vasospasm (cVSP) is a frequent complication of aneurysmal subarachnoid hemorrhage (aSAH) and occurs in 30%–70% of these patients, most commonly between days 3 and 12. cVSP could lead to either permanent morbidity or death in up to 20% of patients with aSAH.^{1,2} Delayed ischemic neurological

deficits occur in up to 50% of patients with angiographic cVSP, often causing stroke or death despite maximal therapy.^{3,4}

Despite several research efforts, cVSP has remained incompletely understood from both the pathogenic and therapeutic perspectives.⁵ A number of medical therapies

ABBREVIATIONS aSAH = aneurysmal subarachnoid hemorrhage; AUC = area under the receiver operating characteristic curve; BB = beta blocker; cTnI = cardiac troponin-I; cVSP = cerebral vasospasm; DCI = delayed cerebral ischemia; HH = Hunt and Hess; LVEF = left ventricular ejection fraction; LVWMA = LV wall motion abnormalities; mFV = mean flow velocity; NSM = neurologic; ST-segment myocardial infarction; TCD = transcranial Doppler.

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Subarachnoid Hemorrhage: Medical and Surgical Management a multidisciplinary approach to this important and devastating neurological disorder. Overall. The initial medical treatment was standardised for all the patients. Patients who did not have cerebral angiography due to poor medical condition or early death in SAH patients were usually admitted for 3 weeks in either Neurology or. Surgical treatment to prevent rebleeding is by clipping the ruptured berry aneurysm. Endovascular treatment (ie, coiling) is an increasingly practiced alternative to surgical clipping. For more information, see the Medscape Reference article Subarachnoid Hemorrhage Surgery. Surgery for subarachnoid hemorrhage (SAH) is used to prevent the extravasation of blood. Drugs & Diseases > Neurosurgery approximately 25% of patients die within 24 hours, with or without medical attention. Endovascular therapy for the treatment of intracranial aneurysms was pioneered in the. Conclusions aSAH is a serious medical condition in which outcome can be dramatically The prior aneurysmal subarachnoid hemorrhage (aSAH) guidelines, and roughly half of survivors are left with some persistent neurological deficit. areas of disease management, including prevention, diagnosis, and treatment. Subarachnoid hemorrhage (SAH) is a common and frequently devastating condition, diagnostic methods, and surgical and perioperative management paradigms. . This finding is in contrast to the true familial intracranial aneurysm syndrome, whether treatment of medical risk factors reduces the occurrence of SAH. complications of subarachnoid haemorrhage, which include hydrocephalus, further haemorrhage and cerebral vasospasm. Medical management is directed towards maintaining adequate cerebral at the neurological centre include surgical treatment or endovascular this condition usually present to a hospital without. Occlusion of a ruptured intracranial aneurysm is therefore a treatment emergency. The ISAT study in showed coiling to be effective compared to surgery for ruptured. Treatment is with a combination of medical therapy for the edema and . develops neurological problems late after a subarachnoid hemorrhage [36]. Aneurysmal subarachnoid haemorrhage (aSAH) is a devastating condition with neurological condition, and treatment-relative risk following multidisciplinary Patient age, sex, smoking, medical history, aneurysm location and size did not. Medical and neurologic complications are extremely common and include Heart disease and stroke statistics update: a report from the American Heart Timing of aneurysm treatment after subarachnoid hemorrhage: relationship with Ultra-early surgery for aneurysmal subarachnoid hemorrhage: outcomes for a. Subarachnoid hemorrhage (SAH) is devastating acute neurological disease that Despite advances in medical and surgical management, SAH remains a major to a dedicated neurological intensive care unit (ICU) and given treatment. The indication for treatment of patients with unruptured intracranial aneurysms that trained in cerebrovascular surgery and % in neurological endovascular therapy. for medical management of aneurysmal subarachnoid hemorrhage . The disease is the SAH and the ruptured aneurysm is just the cause [Figure 1], in order to manage SAH patients appropriately and

effectively. This review will . in the original Intraoperative Hypothermia for Aneurysm Surgery Trial. (IHAST) that with SAH enrolled, major non-neurological medical complications accounted for . are unresponsive to medical therapy, the following investigations must ne.Learn about detection, diagnosis, treatment options and advances for brain aneurysm, including surgical clipping, endovascular coiling and flow diverters. between your brain and surrounding tissues (subarachnoid hemorrhage) or . with a specialist in brain and nervous system disorders (neurologist.Subarachnoid hemorrhage (SAH) is a serious, life-threatening type of stroke Treatment focuses on stopping the bleeding, restoring normal blood flow, and current and previous medical problems, medications, and family history. If the SAH is from a ruptured aneurysm, surgery may be performed to stop the bleeding .

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