Neurogenic stress cardiomyopathy

Key concepts

● impaired cardiac function (reduced ejection fraction) not attributable to underlying coronary artery disease or myocardial abnormalities. May be reversible

● cardiac enzymes (troponin) tend to be lower than expected for the degree of myocardial impairment, distinguishes NSC from acute MI

● putative mechanism: catecholamine surge (possibly in myocardial sympathetic nerves) as a result of hypothalamic stimulation or injury from the SAH

● possible sequelae: hypotension, CHF, arrhythmias... all of which may further exacerbate cerebral ischemia

● peak incidence: 2 days to 2 weeks post-SAH

● risk factors: higher Hunt and Hess grade

● treatment: may include dobutamine (for SBP < 90 and low SVR) and/or milrinone (for SBP > 90 and increased SVR)

Older terms: reversible postischemic myocardial dysfunction, neurogenic stunned myocardium. Classically seen in patients following cardiac surgery, and attributed to a defect in troponin-I (TnI).

Some patients may develop myocardial hypokinesis following SAH.

May appear compatible with an MI on echocardiography, yet, troponin levels are typically lower (often < 2.8 ng/ml) than would be predicted given the level of myocardial impairment.

Peak incidence: 2 days to 2 weeks post SAH. The condition reverses completely in most cases within about 5 days as normal myocardial cells replace those with defective TnI. However, ≈ 10% of patients may progress on to an actual MI.

Stroke volume and cardiac output are reduced. Risk factors include higher Hunt Hess grade (> 3), female gender, smoking status, and age.

Hypotension does not always occur since the reduced cardiac output (CO) may be offset by an increase in SVR. However, the reduced CO may impair the ability to tolerate barbiturates administered for cerebral protection during early surgery due to their myocardial suppressant effect. Intraoperative TEE monitoring may be a useful guide for titrating pressors. The reduced CO may also impede the use of hyperdynamic therapy for vasospasm.