Cardiac Complications After Subarachnoid Hemorrhage

- Japanese Nationwide Questionnaire Survey on the Treatment and Management of Subarachnoid Hemorrhage Due to Ruptured Cerebral Aneurysm
- Delayed cerebral ischemia after aneurysmal subarachnoid hemorrhage: a narrative review
- Awake prone positioning in a patient with respiratory impairment due to subarachnoid hemorrhage: a case report
- Macrophage Lyn Kinase Is a Sex-Specific Regulator of Post-Subarachnoid Hemorrhage Neuroinflammation
- Neurological outcomes and mortality following hyperoxemia in adult patients with acute brain injury: an updated meta-analysis and meta-regression
- The utility of the 5-Item frailty index in assessing the risk of complications and mortality following surgical management of non-traumatic subarachnoid hemorrhage
- Takotsubo Cardiomyopathy After Subarachnoid Hemorrhage: Who Is At Risk?
- The effect of transcutaneous auricular vagus nerve stimulation on cardiovascular function in subarachnoid hemorrhage patients: A randomized trial

Subarachnoid hemorrhage (SAH) is a serious condition, and a myocardial injury or dysfunction could contribute to the outcome.

Acute cardiac complications frequently occur after subarachnoid hemorrhage (SAH). These complications include electrocardiogram (ECG) abnormalities, the release of cardiac biomarkers, and the development of acute stress-induced heart failure resembling Takotsubo cardiomyopathy [1) 2) 3) 4) 5) 6)]

non-ST elevation myocardial infarction, ST-elevation myocardial infarction and cardiac arrest, but their clinical relevance is unclear.

Lång et al. assessed the prevalence and prognostic impact of cardiac involvement in a cohort with SAH in a prospective observational multicenter study. They included 192 patients treated for non traumatic subarachnoid hemorrhage. They performed ECG recordings, echocardiogram, and blood sampling within 24 h of admission and on days 3 and 7 and at 90 days. The primary endpoint was the evidence of cardiac involvement at 90 days, and the secondary endpoint was to examine the prevalence of a myocardial injury or dysfunction. The median age was 54.5 (interquartile range [IQR] 48.0-64.0) years, 44.3% were male and the median World Federation of Neurosurgical Societies grading for subarachnoid hemorrhage score was 2 (IQR 1-4). At day 90, 22/125 patients (17.6%) had left ventricular ejection fractions ≤ 50%, and 2/121 patients (1.7%) had evidence of a diastolic dysfunction as defined by mitral peak E-wave velocity by peak e' velocity (E/e') > 14. There was no prognostic impact from echocardiographic evidence of cardiac complications on neurological outcomes. The overall prevalence of cardiac dysfunction was modest. They found no demographic or SAH-related factors associated with 90 days cardiac dysfunction [7)].

Cardiac complications due to non-traumatic subarachnoid hemorrhage (SAH) are usually described

using classical echocardiographic evaluation. Strain imaging appears to have better sensitivity than standard echocardiographic markers for the diagnosis of left ventricular dysfunction. The aim of this study was to determine the prevalence of cardiac dysfunction defined as a Global Longitudinal Strain (GLS) ≥ - 20% in patients with good-grade SAH (WFNS 1 or 2).

Seventy-six patients with good-grade SAH were prospectively enrolled and analyzed at admission for neurocritical care. Transthoracic echocardiography was performed on days 1, 3, and 7 after hemorrhage. Routine measurements, including left ventricular ejection fraction (LVEF), were performed, and off-line analysis was performed by a blinded examiner, to determine 2-, 3-, and 4-cavity longitudinal strain and left ventricular GLS. GLS was considered altered if it was ≥ - 20%, we also interested the value of ≥ - 17%. LVEF was considered altered if it was < 50%.

On day 1, 60.6% of patients had GLS ≥ - 20% and 21.2% of patient had GLS ≥ - 17%. In comparison, alteration of LVEF was present in only 1.7% of patients. The concordance rate between LVEF < 50% and GLS ≥ - 20% and LVEF ≥ 50% and GLS < - 20% was 46%.

Strain imaging showed a higher prevalence (60.6%) of left ventricular dysfunction during the acute phase of good-grade SAH (WFNS 1 or 2) than previously described [8].

Among patients suffering from cardiac events at the time of aneurysmal subarachnoid hemorrhage, those with myocardial infarction and in particular those with a troponin level greater than 1.0 mcg/L had a 10 times increased risk of death [9].

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