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INPLASY

# Location of Ruptured Aneurysm in Subarachnoid Hemorrhage Related Takotsubo Cardiomyopathy: Systematic Review and Meta-analysis

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**ADMINISTRATIVE INFORMATION**

**Support -** None.

**Review Stage at time of this submission -** Data extraction.

**Conflicts of interest -** None declared.

**INPLASY registration number:** INPLASY202410057

**Amendments -** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 13 January 2024 and was last updated on 13 January 2024.

## INTRODUCTION

**Review question / Objective** What is the association between the development of Takotsobu cardiomyopathy in patients who develop subarachnoid hemorrhage in differing anatomic locations of the cerebral vasculature?

**Condition being studied** Takotsubo cardiomyopathy or stress cardiomyopathy is a syndrome characterized by transient regional systolic cardiac dysfunction of the left ventricle, mimicking myocardial infarction which often occurs after subarachnoid hemorrhage.

## METHODS

**Search strategy** MEDLINE database, Google Scholar, and Cochrane databases.

**Participant or population** Patients who developed stress cardiomyopathy in the setting of subarachnoid hemorrhage.

**Intervention** Patients who experience subarachnoid hemorrhage and subsequently develop stress cardiomyopathy, defined as apical ballooning and apical hypokinesis or apical akinesis.

**Comparator** None.

**Study designs to be included** Studies that described patients with stress cardiomyopathy in the setting of SAH were included. Classical stress cardiomyopathy was defined as apical ballooning and apical hypokinesis or apical akinesis. The included studies had to explicitly mention stress cardiomyopathy as the target patient population

with exclusion of studies conducted solely on stress cardiomyopathy variants or neuro-cardiogenic injury patients.

**Eligibility criteria** Inclusion: Studies that described patients with stress cardiomyopathy in the setting of SAH were included. Classical stress cardiomyopathy was defined as apical ballooning and apical hypokinesis or apical akinesis. The included studies had to explicitly mention stress cardiomyopathy as the target patient population with exclusion of studies conducted solely on stress cardiomyopathy variants or neuro-cardiogenic injury patients. Exclusion: Case reports, case series, traumatic SAH, and patients with cerebral hemorrhage other than SAH were excluded.

**Information sources** We systematically explored major electronic medical information sources (MEDLINE database, Google Scholar, and Cochrane databases (CENTRAL)) to identify cohort studies of TCM or SCM with SAH in cooperation with a professional librarian. The reference lists of the retrieved articles were reviewed, to ensure that no additional articles were missed. Two authors (SY and AK) independently extracted the data. Discrepancies were resolved by consensus among the authors. After the search, two independent reviewers selected the articles with inclusion criteria and human subjects in English.

**Main outcome(s)** Evaluate the association between the location of the aneurysm and Takotsubo cardiomyopathy of the subarachnoid hemorrhage patient population who developed stress cardiomyopathy during their hospital stay.

**Quality assessment / Risk of bias analysis** Newcastle-Ottawa Quality Assessment Scale.

**Strategy of data synthesis** For statistical analysis, demographic and clinical characteristics of patients from published series and of patients with SAH-related stress cardiomyopathy will be compared by summary odds ratios (ORs) constructed using both fixed effects Mantel–Haenszel method and random effects DerSimonian and Laird method. The p-values will be two-tailed, with statistical significance set at 0.05 and confidence interval (CI) calculated at 95% level for all statistical analysis. The meta-analysis was conducted using R statistics.

**Subgroup analysis** None.

**Sensitivity analysis** None.

**Country(ies) involved** United States of America, Japan.

**Keywords** Subarachnoid Hemorrhage; Takotsubo Cardiomyopathy; Stress Cardiomyopathy; Critical Care; Neuroanesthesia.

**Dissemination plans** Publish in a reputable journal.

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