# Seizure after aneurysmal subarachnoid hemorrhage

- Subarachnoid hemorrhage, part 2 : Treatment, complications and long-term sequelae
- A Case of Postpartum Reversible Cerebral Vasoconstriction Syndrome with Extracranial Artery Involvement
- A rare case of Fahr's disease with posterior circulation (basilar tip) aneurysm- pathophysiology, management, and complications
- The effect of antiseizure medication on mortality in spontaneous aneurysmal subarachnoid hemorrhage
- SAHRANG: Subarachnoid Hemorrhage Recovery and Galantamine - A pilot multicenter randomized placebo-controlled trial
- Cerebral Venous Thrombosis in Traumatic Brain Injury: A Population-Based Cross-Sectional Study of 640 Patients
- Aneurysmal Subarachnoid Hemorrhage Risk Assessment Model Identifies Patients for Safe Early Discharge at Day 15-The SAFE-SaH Score
- High risk and low incidence diseases: Aneurysmal subarachnoid hemorrhage

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## Epidemiology

Literature has reported seizure rates to be as high as 27% in this population [1].

More recently published studies have found seizure rates to be significantly lower than previously described (1–10%) [2] [3].

## Risk factors

Paavola et al. examined data for 760 consecutive 12-month survivors of aneurysmal subarachnoid hemorrhage, born in 1950 or after, with a first aSAH from January 1, 1995, to December 31, 2018. Of the 760 patients (median age, 47 years; 53% females; median follow-up, 11 years), 111 (15%) developed epilepsy at a median of 7 months (interquartile range, 2-14 months) after admission for aSAH. Of the 2240 population controls and 4653 first-degree relatives of aSAH patients, 23 (0.9%) and 80 (1.7%) respectively developed epilepsy during the follow-up period. Among the 79 patients with epilepsy in first-degree relatives, 22 (28%) developed epilepsy after aSAH; in contrast, among the 683 patients with no epilepsy in first-degree relatives, 89 (13%) developed epilepsy after aSAH. Having at least one relative with epilepsy was an independent risk factor for epilepsy after aSAH (hazard ratio, 2.44; 95% confidence interval, 1.51-3.95). Cumulative 1-year rates by first-degree relationship were 40% with one or more children with epilepsy, 38% with one or more affected parents, 5% with one or more affected siblings, and 10% with no relatives with epilepsy.

Patients who developed epilepsy after aSAH were significantly more likely to have first-degree relatives with epilepsy than those who did not develop epilepsy after the aSAH [4].

Epilepsy is a common and serious complication of subarachnoid hemorrhage (SAH), giving rise to increased morbidity and mortality. It's difficult to identify patients at high risk of epilepsy and the application of antiepileptic drugs (AEDs) following SAH is a controversial topic. Therefore, it's pressingly needed to gain a better understanding of the risk factors, underlying mechanisms, and the optimization of therapeutic strategies for epilepsy after SAH. Neuroinflammation, characterized by microglial activation and the release of inflammatory cytokines has drawn growing attention due to its influence on patients with epilepsy after SAH. In a review, Wang et al. discussed the risk factors for epilepsy after SAH and emphasize the critical role of microglia. Then they discussed how various molecules arising from pathophysiological changes after SAH activates specific receptors such as TLR4, NLRP3, RAGE, P2X7R and initiate the downstream inflammatory pathways. Additionally, they focused on the significant responses implicated in epilepsy including neuronal excitotoxicity, the disruption of the blood-brain barrier (BBB), and the change of immune responses. As the application of AEDs for seizure prophylaxis after SAH remains controversial, the regulation of neuroinflammation targeting the key pathological molecules could be a promising therapeutic method. While neuroinflammation appears to contribute to epilepsy after SAH, more comprehensive experiments on their relationships are needed [5].

## Complications

Seizure activity has been associated with secondary neurologic injury including reduced cerebral blood flow and intracranial hypertension [6].

## Prohylaxis

see Anticonvulsant in aneurysmal subarachnoid hemorrhage.

## References

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