

ACUTE SYMPTOMATIC SEIZURES AND EARLY STATUS EPILEPTICUS IN ANEURYSMAL SUBARACHNOID HEMORRHAGE: A RETROSPECTIVE COHORT STUDY

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OBJECTIVES

To investigate the occurrence and characteristics of acute symptomatic seizures (ASS) and early status epilepticus (ESE) in patients with aneurysmal subarachnoid hemorrhage (aSAH), and to identify clinical, demographic, and radiological factors associated with their onset.

MATERIALS AND METHODS

We conducted a retrospective analysis of **141 patients** admitted to our hospital for aSAH between August 2015 and May 2025. Patients were included if they presented angiographic evidence of an aneurysm and provided complete clinical documentation, with no restrictions regarding age or sex. Patients with a pre-existing epilepsy diagnosis or insufficient data were excluded. EEG was performed in 84 patients (59%) when clinically indicated. Patients were categorized into two groups: those who experienced clinically observable seizures or status epilepticus during hospitalization (early group, n=34) and those who did not (non-early group, n=107).

RESULTS

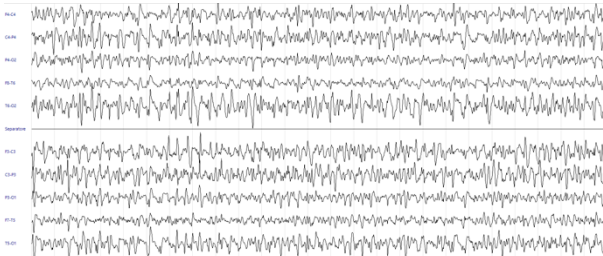
Early seizures or ESE occurred in 24.1% of the cohort. Patients in the early group were older (median age 66 vs 58 years) and more frequently female (76% vs 59%). They had significantly worse neurological status on admission (median GCS 13 vs 15; Hunt&Hess 3 vs 2), and higher WNFS and Vasograde scores (both medians 3 vs 2). The modified Fisher score was also higher (median 4 vs 3). Mortality at 30 day and 6 months was markedly higher in the early group (15% vs 8 % and 29% vs 6%, respectively). The most common aneurysm site among seizure patients was the **anterior communicating artery (ACOM, 43%)**.

| | NOT ES + ESE n = 107 | ES + ESE n = 34 |
|---|-------------------------|--------------------|
| Demographics | | |
| Age (years) [median (IQR)] | 58 (51–69) | 66 (53–77) |
| Females (n (%)) | 63 (59) | 26 (76) |
| Type of intervention (n (%)) | | |
| Clipping | 82 (77) | 20 (59) |
| Coiling | 24 (22) | 12 (35) |
| None | 1 (1) | 2 (6) |
| Outcome [median (IQR)] | | |
| 30-day mortality | 9 (8) | 5 (15) |
| 6-month mortality | 6 (6) | 10 (29) |
| 1-year mortality | 2 (2) | 0 (0) |
| Clinical severity [median (IQR)] | | |
| GCS at arrival | 15 (7-15) | 13 (8-15) |
| Severity scale [median (IQR)] | | |
| Hunt&Hess score | 2 (1-5) | 3 (2-4) |
| Fisher score | 4 (3-4) | 4 (3-4) |
| Modified Fisher score | 3 (3-4) | 4 (3-4) |
| WNFS | 2 (1-4) | 3 (2-4) |
| Vasograde | 2 (2-3) | 2 (2-3) |
| Site of aneurysm (n (%)) | | |
| ACA | 13 (10) | 3 (9) |
| MCA | 35 (28) | 8 (23) |
| PCA | 2 (2) | 0 (0) |
| ICA | 18 (14) | 3 (9) |
| PCOM | 15 (12) | 4 (11) |
| ACOM | 36 (29) | 15 (43) |
| BA | 3 (2) | 0 (0) |
| PICA | 1 (1) | 1 (3) |
| AICA | 1 (1) | 0 (0) |
| VA | 2 (2) | 1 (3) |

Table 1 – Demographic, clinical and radiologic features of our sample.

DISCUSSION

Our findings suggest that acute symptomatic seizures are more likely to occur in the context of greater initial brain injury and critical clinical presentation. Moreover, radiological delayed cerebral ischemia (DCI) was more common among patients with early seizures; according to literature data seizures may be both markers and mediators of secondary brain injury, potentially exacerbating DCI and worsening outcomes [1, 2]. The association between early seizures and worse short- and mid-term mortality observed in our data underscore the importance of early seizure occurrence as a potential marker of disease severity in aSAH patients.



Figures – CT scan showing SAH (up, on the left), Grade 4 on Fisher scale, due to right ICA aneurysm (up, on the right). On the left, 13-channel EEG performed on 3rd day after admission showing generalized epileptiform activity consistent with status epilepticus.

CONCLUSIONS

These data reveal a notable difference in **clinical presentation** and **short- to mid-term mortality** between patients with and without early seizures or early status epilepticus following aneurysmal subarachnoid hemorrhage. The presence of early seizures reflects a more complex clinical profile, underscoring the need for careful monitoring and management during the acute phase of aSAH.

References

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