Clinical seizures associated with a worse clinical outcomes at hospital discharge in aSAH patients

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Estimates of seizure after aneurysmal subarachnoid hemorrhage (aSAH) vary widely, reported rates range from 1% to 28%. Moreover, seizures increase mortality and disability in patients with aSAH regardless of common aSAH complications such as: rebleeding, delayed cerebral injury and symptomatic vasospasm. We sought to establish the frequency of seizures in an aSAH patients, along with their impact over patient prognosis, during hospitalization and upon discharge.

Background

- Seizure is a known complication after aneurysmal subarachnoid hemorrhage (aSAH).
- Previous studies have reported an association between seizure and increased mortality and disability in patients with aSAH.

Inclusion Criteria

- Age > 18
- SAH diagnosed by imaging or LP admitted to NCCU
- Complete medical record for entire hospital course

Exclusion Criteria

- Incomplete documentation on EMR
- No adequate imaging or laboratory data available for evaluation

Figure 1. Inclusion and exclusion criteria.

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Objectives

1. To identify the frequency and rates of clinical seizures after aSAH.
2. To compare outcomes at discharge (Glasgow Outcome Scale: GOS) between seizure and seizure-free subjects.
3. To assess the relationship among seizures and discharge disposition.

Methods

- Retrospective review of consecutive patients with aSAH admitted to the Baylor-St. Luke's Medical Center Neuroscience Critical Care Unit (NCCU) (January 2008 – December 2012) (Figure 1).
- Demographics, admission GCS, admission mRS, incidence of clinical seizures and clinical outcome at discharge were recorded.
- Poor clinical outcome was defined as GOS of < 4.
- Associations between seizures and clinical outcome at discharge (GOS) were investigated using a multivariate logistic regression model.

Table 1. Patient demographics and outcome comparison among seizure and seizure-free patients.

	Seizure (%)	Seizure-free (%)	*p*-value
Female	57.1	71.4	0.53
Age (mean ± SD)	53.4 ± 18.4	59.3 ± 14.5	0.29
Good Outcome	28.6	68.9	0.04
Poor Outcome	71.4	31.0	
Favorable Disposition	42.9	72.8	0.11
Unfavorable disposition	57.1	27.2	

Figure 2. Outcome (GOS) comparison in seizure and seizure-free.

Table 2. Multivariate logistic regression analysis of maximum likelihood estimates.

Parameter [a]	Estimate	S.E. [b]	Wald χ^2	*p*-value
Seizure	1.7947	0.8974	3.9990	0.0455
Gender	-0.2172	0.3613	0.3614	0.5477
Ethnicity	0.0836	0.1620	0.2664	0.6057
Admission GCS	-0.2029	0.0432	22.0846	< 0.0001
Admission mRS	0.4673	0.2020	5.3544	0.0207

[a] DF = 1; [b] Standard error

Clinical outcomes were worse in patients with clinical seizure in aSAH.

Results

- 226 patients with aSAH included (71% female).
- Clinical seizures were identified in 7 patient (3.1%) prior to discharge.
- Clinical outcome was significantly worse (GOS < 4) in the seizure group compared to the seizure-free group, poor outcome was found in 71.4% vs. 31%, respectively ($p = 0.04$) (Figure 2).
- This increased risk was significant after controlling for gender, ethnicity, serum Mg, admission GCS and admission mRS (Table 2).
- Unfavorable discharge disposition (LTAC, SNF, hospice, death) was more common for the seizure group compared to the seizure-free group, 57.1% vs. 27.2%, respectively., however this difference did not reached statistical significance ($p = 0.11$).

Conclusions

- Our results showed a low frequency of clinical seizures (3.1%) presenting after aSAH, when compared to other series that have identified an increased incidence of seizures through multimodal approaches.
- Our study shows a significant association between worse outcomes and clinical seizures in patients with aSAH.
- We additionally were able to establish a non-significant trend towards an unfavorable discharge disposition, among patients with seizures.
- Further large prospective studies are required to clarify this association.

Our findings imply a possible unfavorable discharge disposition with patient's with seizures.