

EARLY SEIZURES AND EARLY STATUS EPILEPTICUS FOLLOWING ACUTE CEREBROVASCULAR EVENTS: A RETROSPECTIVE STUDY IN A STROKE UNIT POPULATION

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BACKGROUND AND OBJECTIVES

Early post-stroke seizures occur in about 2–6% and 0.2–0.3% of ischemic strokes are reported to possibly develop SE [1]. We aim to investigate the occurrence and characteristics of early epileptic seizures (ES) and early status epilepticus (ESE) following acute cerebrovascular events in our cohort, and to identify clinical, radiological and laboratory factors associated with their onset.

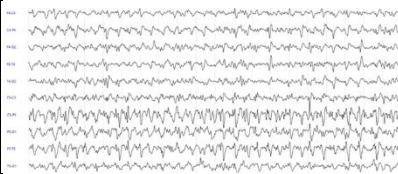
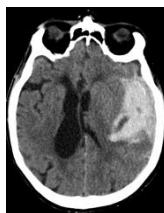


Figure 1 and 2 – 13-channel EEG performed on 3rd day after admission showing left continuous epileptic activity consistent with status epilepticus (image on the right) in a patient with left temporal intraparenchymal hemorrhage. CT scan at admission showed on the left.

| n = 775 | |
|---------------------------------------|------------|
| Demographics | |
| Age (years) [median (IQR)] | 77 (67–83) |
| Females [n (%)] | 380 (49) |
| Comorbidities [n (%)] | |
| Atrial fibrillation | 263 (34) |
| Diabetes mellitus | 176 (30) |
| Hypertension | 594 (77) |
| Hypercholesterolemia | 443 (57) |
| Cardiovascular disease | 310 (40) |
| Renal failure | 101 (13) |
| Previous cerebrovascular event | 121 (16) |
| Smoke | 132 (17) |
| Type of stroke [n (%)] | |
| Ischemic stroke | 655 (85) |
| Haemorrhagic stroke | 120 (15) |
| Reperfusion treatment [n (%)] | 402 (52) |
| TOAST classification [n (%)] | |
| Cardioembolic (CE) | 193 (29) |
| Large Arterial Atherosclerosis (LAA) | 83 (13) |
| Small Arterial Occlusion (SAO) | 134 (20) |
| Other cause | 34 (5) |
| Cryptogenic | 210 (32) |
| Bamford classification [n (%)] | |
| TACI | 157 (24) |
| PACI | 281 (43) |
| LACI | 133 (20) |
| POCI | 75 (11) |

MATERIALS AND METHODS

We conducted a retrospective analysis of **775 patients** admitted to the Stroke Unit of our hospital, from September 2020 to July 2023. Patients were included if they had experienced an acute ischemic stroke, hemorrhagic stroke, with no age or sex restrictions, and provided complete clinical documentation. Patients were categorized into two groups: those who experienced clinically observable early seizures or status epilepticus within 7 days of the acute event (**early group, n=55**) and those who did not (**non-early group, n=720**). Exclusion criteria included cerebral venous thrombosis, stroke mimics, epilepsy diagnosis, and insufficient clinical data. Variables collected included demographic data, comorbidities, stroke characteristics, laboratory values, and follow-up outcomes (**Table 1**, on the left).

RESULTS

Among the 775 patients, 55 (7.1%) experienced ES/ESE. The univariate logistic regression analysis conducted on the sample identified **NIHSS at baseline** ($p=0.008$; OR: 1.003), **type of stroke** (ischemic or hemorrhagic; $p=0.02$; OR: 0.942), **renal failure** ($p<0.001$; OR: 1.082), and **N/L ratio** (NLR; $p<0.001$; OR: 1.004). Moreover, the early group regarding stroke etiology showed an absence of small vessel occlusion (SAO: 0% vs 22%). **Early seizure patients had worse functional outcomes**: higher NIHSS and mRS at discharge and at 3 months (**figure 3**) and slightly increased in-hospital mortality (4% vs 2%), although not statistically significant.

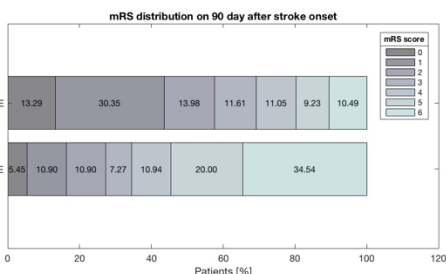


Figure 3 – Comparative plot of the 90-day modified Rankin Scale (mRS) showing clinical outcomes for early group and non-early group.

DISCUSSION

Our findings are consistent with previous studies indicating that early seizures after stroke are linked to greater stroke severity and poorer outcomes. Furthermore, studies like those by Sinka et al. [2] highlight how early seizures may not only reflect greater brain injury but could also contribute to worse recovery trajectories. The association with elevated NLR observed in our cohort supports emerging evidence on systemic inflammation as a possible cofactor in epileptogenesis post-stroke [3]. The absence of SAO among seizure patients further underscore the role of stroke subtype in seizure risk.

CONCLUSIONS

The identification of predictors for early seizures and status epilepticus can **improve risk stratification and inform targeted EEG monitoring and prophylactic strategies** in acute stroke care.

References

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