POST-ICTAL MRI ABNORMALITIES AND REFRACTORINESS OF STATUS EPILEPTICUS

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Every Life Matters

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Introduction

- Case fatality ratio of SE: 4.6-39%
- New comorbidities : 10.7% & Intractable epilepsy : 0.8%
- The outcomes of refractory (RSE) and super refractory status epilepticus (SRSE) are poorer as compared to non-refractory status epilepticus (NRSE).

Aims: to observe

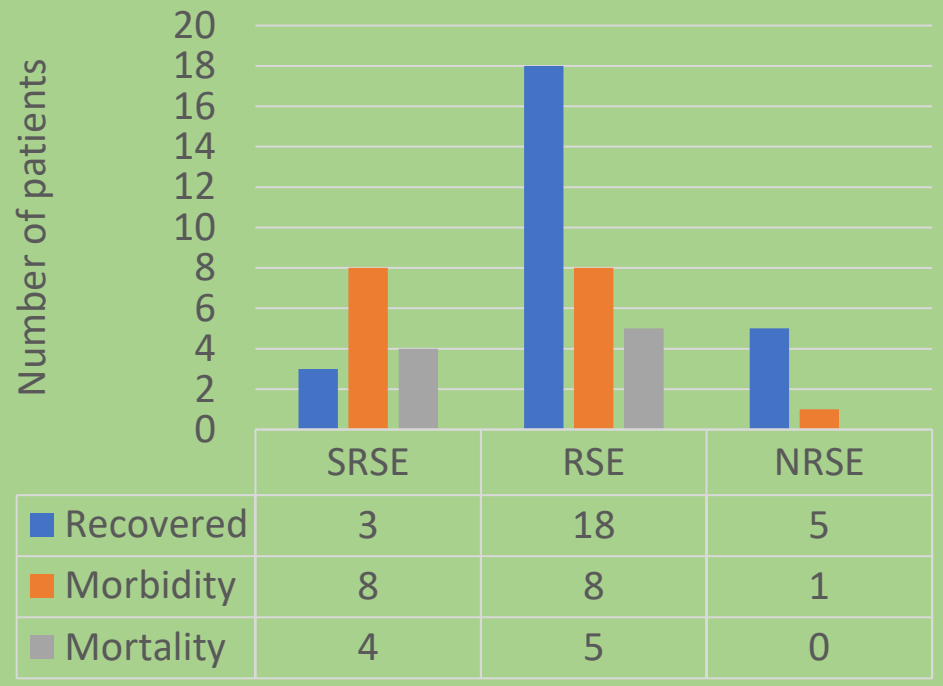
- The outcomes of RSE, SRSE and NRSE
- The presence of post-ictal MRI abnormalities (PMA) in each group of SE
- PMA as a predictor of outcomes in groups of SE

Materials and Methodology

- **Sample size:** 52 adults SE , Duration: from 2021 to 2024 (3 years) Location: tertiary care setting
- **Inclusion:** Adults consenting with post-ictal MRIs
- **Exclusion**: Patients ineligible for MRI
- **Study design:** Retrospective observational study
- **Outcomes:** Glasgow outcome score (GOS) for prognostication.
- **Statistical analysis:** using the Fischer's exact, Freeman-Halton's extension of Fischer's exact test using SPSS version 29 and Microsoft excel. Statistical significance level was set at 95% (p 0.05), two-tailed.

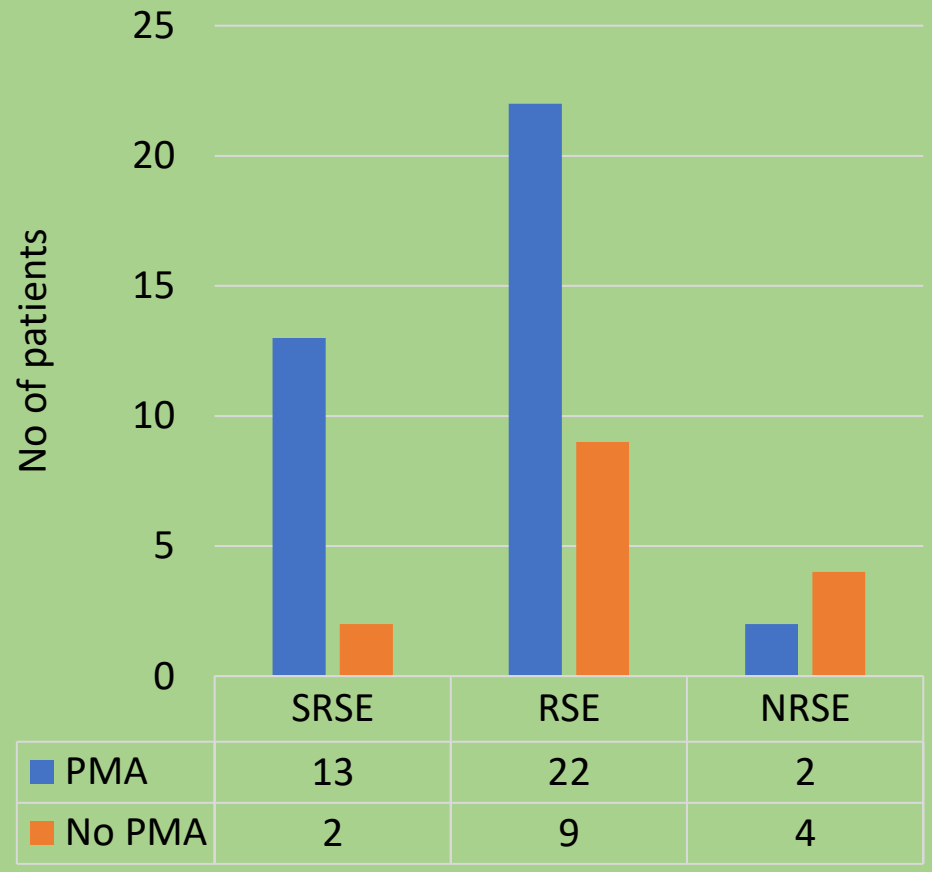
Results

No of patients in each group : RSE : 31, SRSE: 15 and NRSE: 6



	SRSE	RSE	NRSE
Recovered	3	18	5
Morbidity	8	8	1
Mortality	4	5	0

Figure 2: Outcomes as per refractoriness of SE (P=0.056 using Freeman-Halton's extension of Fischer's exact test)



	SRSE	RSE	NRSE
PMA	13	22	2
No PMA	2	9	4

Figure 3: PMA and refractoriness of SE

Morbidity and mortality is higher in RSE and SRSE compared to NRSE

Significant presence of PMA was in RSE and SRSE than NRSE group ($p < 0.05$)

Results

RSE (n=31)	SRSE (n=15)	NRSE (n=6)
5 deaths	4 deaths	No deaths
60% had PMA	100% had PMA	-

RSE (n=31)	SRSE (n=15)	NRSE (n=6)
8 had morbidity	8 had morbidities	1 Had morbidity
75% PMA	87% had PMA	100% had PMA

Presence of PMA and its association with poor outcome did not show statistically significant findings, but could be limited due to the sample size.

Discussion

- In a studied retrospective cohort, ictal changes on MRI were associated with a higher risk of neurological deterioration at discharge and, possibly, with a longer duration of SE and poorer survival. (1)
- Bonduelle T et al in a retrospective cohort, found In-hospital death occurred in 15% (45/307) patients and was significantly higher in the PMA-positive group (27%, 21/79 vs 11%, 24/228; $p < 0.001$). (2)
- Prospective analysis of PMA was done by Pascarella et al where PMAs were more common in SE and CS than in SiS. Acute underlying pathology was frequently associated with PMAs. However, clinical implications weren't determined. (3)

Conclusion

- We observed that PMA is seen more frequently and significantly with RSE and SRSE.
- We observed post ictal MRI abnormalities more frequently in those with new morbidity and mortality.
- PMA represents a promising structural biomarker for developing a personalized approach to prognostication in patients with SE.
- Larger prospective studies are needed to form predictive models regarding clinical implications of PMA.

References

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3) Pascarella A, Manzo L, Marsico O, et al. Investigating Peri-Ictal MRI Abnormalities: A Prospective Neuroimaging Study on Status Epilepticus, Seizure Clusters, and Single Seizures. J Clin Med. 2025;14(8):2711. Published 2025 Apr 15.