



# GELASTIC SEIZURES “BEYOND HYPOTHALAMIC HAMARTOMAS”- PREVALENCE AND OUTCOME

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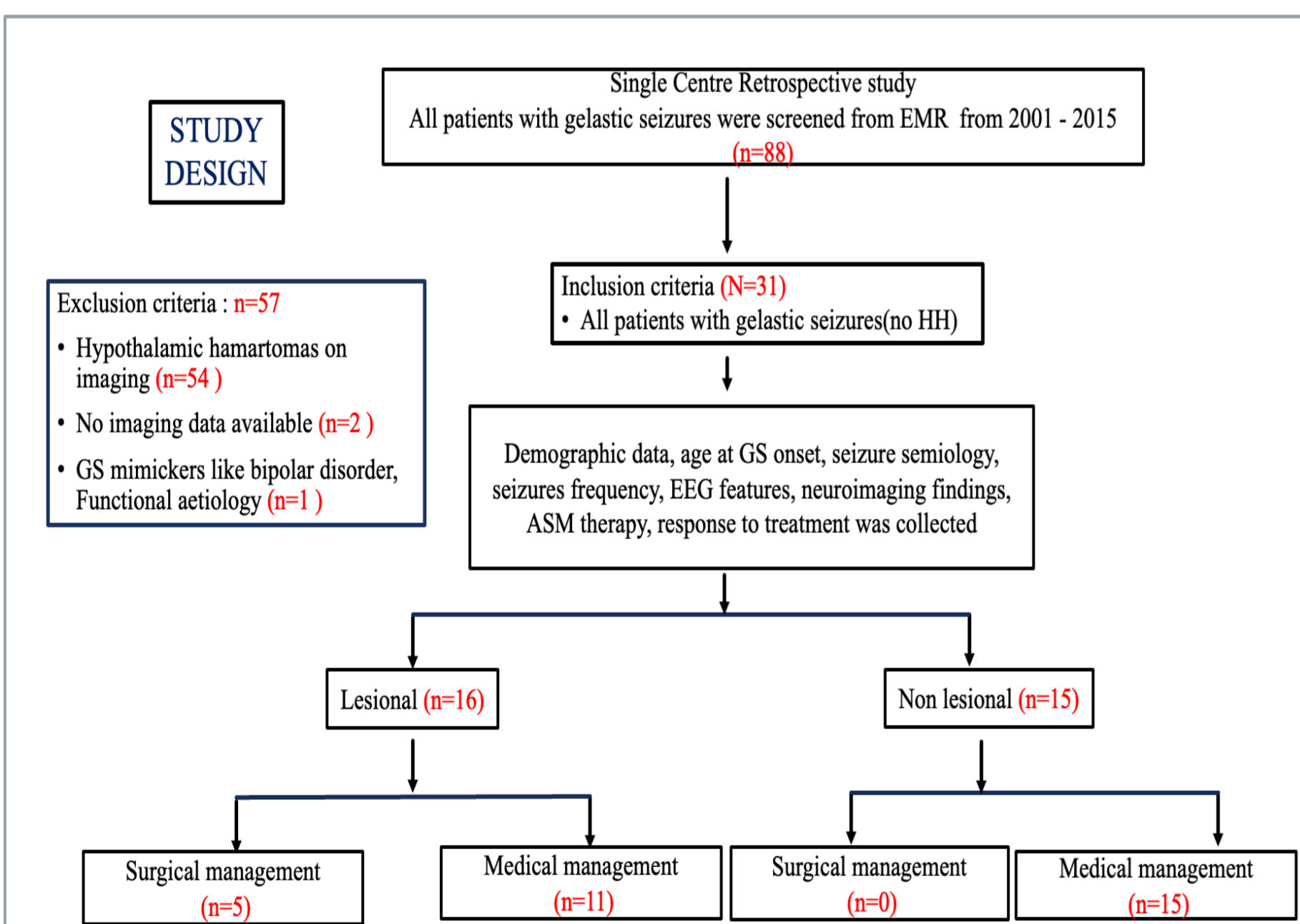
## INTRODUCTION

- Gelastic seizures are sudden outbursts of stereotyped laughter not induced by external stimuli.
- Constitute < 1% of total seizure types
- Hallmark manifestation of Hypothalamic hamartomas (HH)
- When not associated with HH, GS have been described in patients with cortical lesions-temporal, frontal, parietal, and insular cortices
- Considering the alternate ictal origin, this subset is likely to have a different pathophysiology and response to available treatment modalities
- Scanty data regarding the spectrum

## OBJECTIVES

1. To assess the prevalence of gelastic seizures not due to hypothalamic hamartomas
2. To describe their electro-clinical localisation
3. To assess the predictors of clinical outcome

## METHODOLOGY

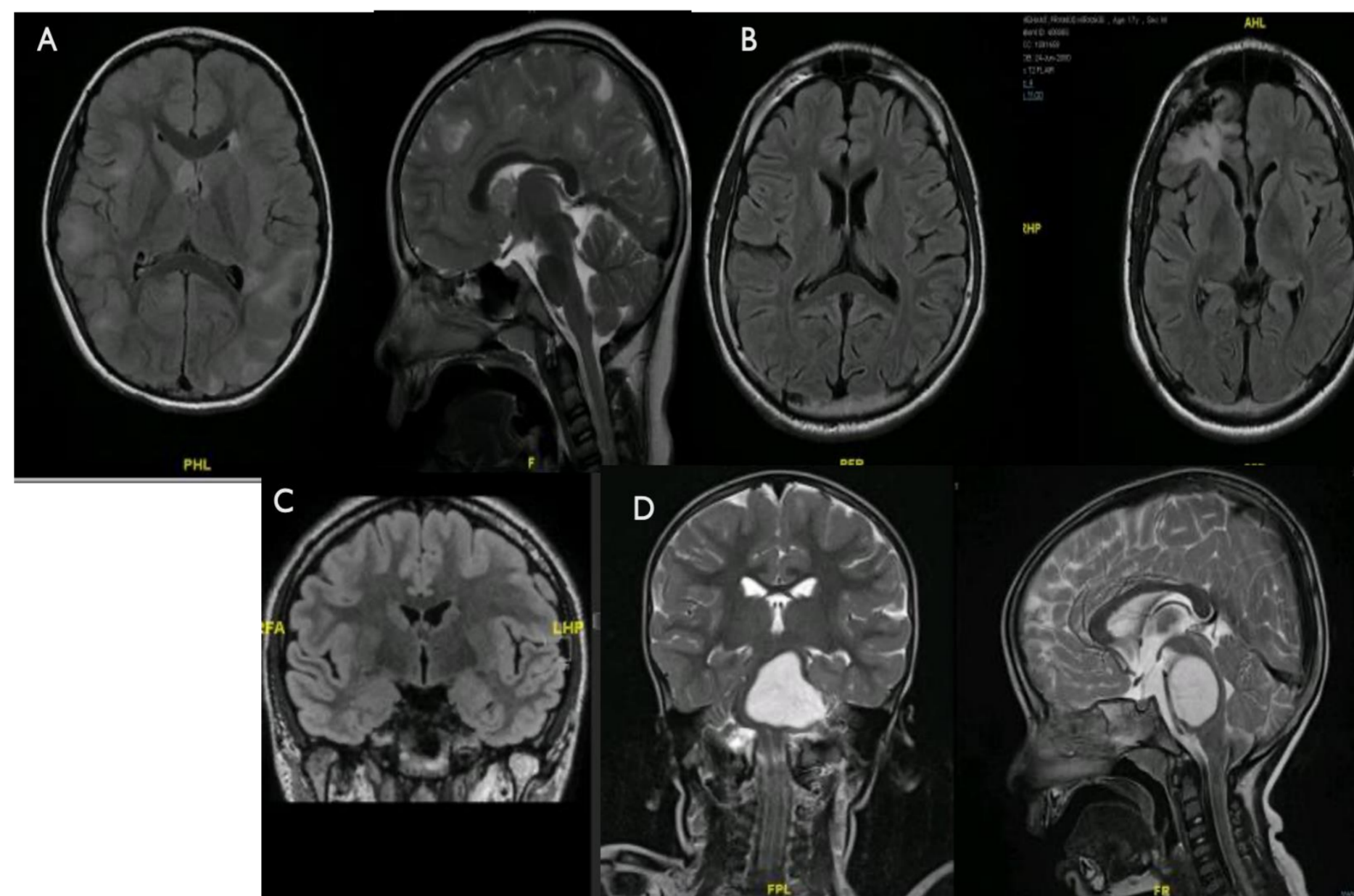
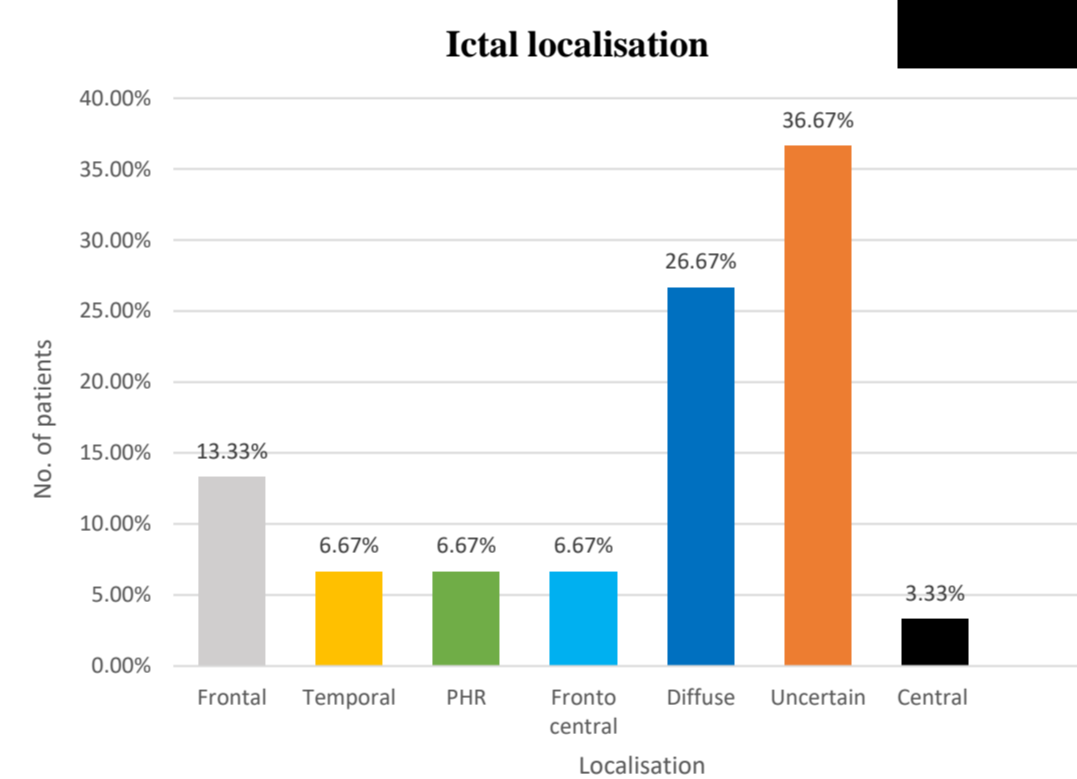
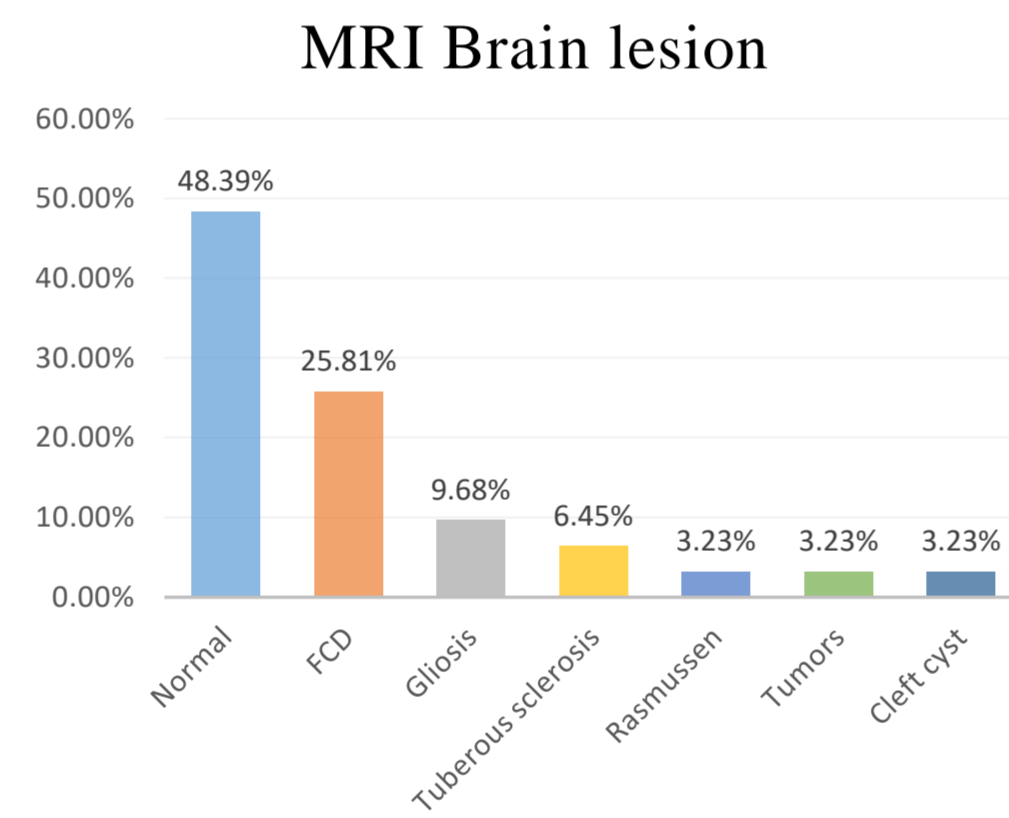


Clinical outcome was assessed using Engel Classification

## RESULTS

Mean age of presentation -10.73 +/- 7.81 years  
Prevalence of GS not due to HH – 35%

| VARIABLE                    |   |
|-----------------------------|---|
| Clinical presentation n (%) | <ul style="list-style-type: none"> <li>• GS alone: n = 3 (9.7%)</li> <li>• GS PLUS:</li> <li>• Focal motor with GS n = 20 (64.5%)</li> <li>• Focal motor with secondary generalization n = 3(9.7%)</li> <li>• Myoclonic jerks n=2 (6.5%)</li> <li>• Dacrystic n=2 (6.5%)</li> <li>• Flexor spasms n=1 (3.2%)</li> </ul> |
| EEG localization n (%)      | <ul style="list-style-type: none"> <li>• Interictal - Frontal n = 9(29%)</li> <li>• Ictal – Uncertain n=11(36.7%)</li> </ul>  |
| Surgical management         | 5 (16.1 %) underwent surgery with Engel 3 and 4 outcome   |



REPRESENTATIVE MRI BRAIN IMAGES : (A)Multiple cortical tubers in a patient with tuberous sclerosis (B)Right frontal focal cortical dysplasia before and after resection , (C)Left frontal cortical dysplasia,(D) Pilocytic astrocytoma

| VARIABLE                 | P value |
|--------------------------|---------|
| Semiology                | 0.33    |
| Cognitive inv            | 0.34    |
| EEG localisation         | 0.06    |
| ASM Combination          | 0.07    |
| Lesional vs Non Lesional | 0.22    |

Variable- Association with outcome

| VARIABLE                              | P VALUE |
|---------------------------------------|---------|
| Relapse after remission               | 0.005   |
| ASM polytherapy                       | 0.049   |
| Past H/O seizures of varied semiology | 0.002   |

Multivariate regression analysis – Predictors of outcome

## References

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2. Gascon GG, Lombroso CT. Epileptic (gelastic) laughter. *Epilepsia* 1971; 12: 63-76.
3. Iapadre G, Zagaroli L et al. Gelastic seizures not associated with hypothalamic hamartoma: A long-term follow-up study. *Epilepsy Behav.* 2020 Feb;103(Pt A):106578. doi: 10.1016/j.yebeh.2019.106578. Epub 2019 Nov 1. PMID: 31680025.
4. Wild B, Rodden FA, Grodd W, Ruch W. Neural correlates of laughter and humour. *Brain.* 2003 Oct;126(Pt 10):2121-38. doi: 10.1093/brain/awg226. Epub 2003 Oct 10. PMID: 12902310.

## DISCUSSION

Very limited data regarding gelastic seizures not due to hypothalamic hamartomas.

|                     | SAMPLE SIZE | RESULTS   | LOCALISATION   |
|---------------------|-------------|---|--|
| Index study         | N=31        | Predictors of seizure freedom – Non lesional, development, Diurnal events Surgery – Engel 3-4 outcome | <b>Interictal:</b> Frontal>Multi-focal> PHR > Temporal<br><b>Ictal:</b> Uncertain> Diffuse>Frontal |
| Lapadre et al; 2021 | N= 30       | Poor outcome was noted in lesional GS compared to non lesional  | Frontal > Temporal   |
| Gutierrez C; 2016   | N=16        | Good outcome in patients who underwent surgery  | Temporal > Frontal   |

## CONCLUSIONS

- Largest cohort of a rare spectrum of epilepsy subtype
- Prior seizure history (polymorphic seizures), ASM polytherapy, relapse of seizures after a period of remission were associated with worse clinical outcome.
- Our electrophysiological and surgical outcome data reiterate that “**the gelastic component may be due to a circuitry rather than a focal area**”

