Clinical and qEEG Correlates of Tic Severity and Short-Term Outcome in Pediatric Tic Disorders: A Prospective Study

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BACKGROUND

Clinical Problem: Tics impair daily functioning and quality of life. Although many improve during adolescence, **~20% of cases persist/worsen** into adulthood.

Pathophysiology: Tic disorders (e.g., Tourette Syndrome) involve **corticostriatal-thalamocortical (CSTC) circuit** dysfunction, frequently co-occurring with **ADHD** and **OCD**.

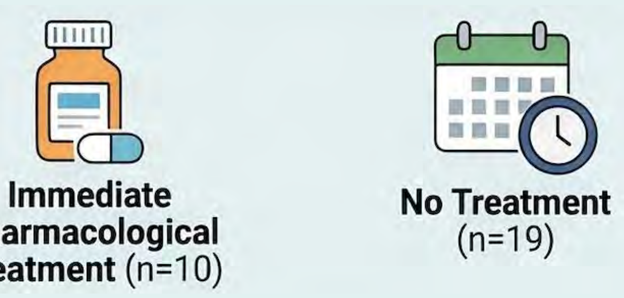
Quantitative EEG Role: qEEG tracks brain dynamics to identify neurophysiological patterns linked to tic generation and symptom dimensions.

AIM OF THE STUDY: to investigate the relationship between resting-state qEEG parameters, clinical phenotype, and short-term outcome in pediatric tic disorders.

MATERIALS AND METHODS

- 29 patients aged 3-18 years old
- Baseline evaluation of symptom severity using YGTSS, PUTS, CY-BOCS and CGI-S.
- Baseline resting-state EEG recordings and qEEG evaluation: theta/beta ratio (TBR), alpha peak frequency (APF), spectral power, and mean frequency.

Subdivision of patients into two groups:



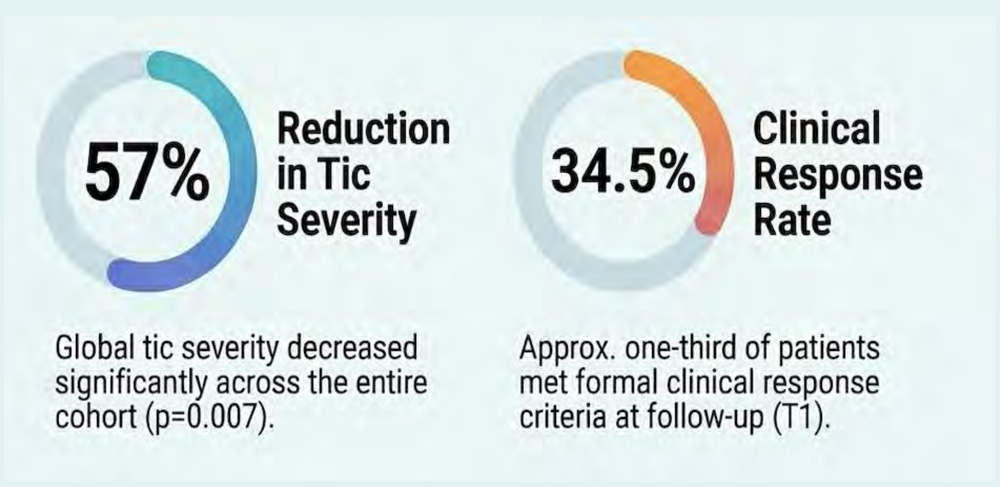
RESULTS

Baseline Characteristics

- **Higher clinical severity** in the treated group vs. untreated group (YGTSS: 40.8 vs. 16.4, p<0.001).
- **No significant differences** between groups in most qEEG parameters at baseline.

Clinical Outcomes and Predictors

- **Significant tic improvement** over time: patients showed significant tic improvement over time and a high clinical response rate (see charts)
- **Baseline clinical severity** was the **strongest predictor of improvement**, showing significant correlations between ΔYGTSS and baseline YGTSS (rho=0.740, p<0.001), motor tic severity (rho=0.798, p<0.001) and CGI-S (rho=0.582, p=0.007)



qEEG Findings

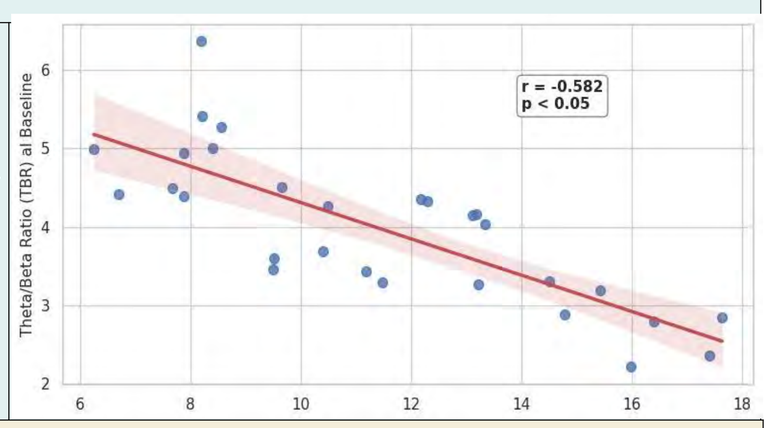
Global tic severity and clinical outcome were not associated with or independently predicted by qEEG parameters.

Specific symptom dimensions showed localized associations:

Premonitory urges *showed a trend-level association with beta activity (r=0.355, p=0.059).*

Alpha peak frequency (APF) *emerged as potentially relevant for prognosis in multivariable models.*

Age *correlated significantly with qEEG measures, consistent with expected neurodevelopmental patterns.*



CONCLUSIONS

Although qEEG markers did not reflect overall tic burden or short-term outcomes, they may capture specific clinical dimensions (e.g., premonitory urges) and developmental processes.