

EEG changes during pregnancy and association with clinical course of epilepsy

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INTRODUCTION

Pregnancy presents unique challenges in women with epilepsy (WwE). Our aim was to: (i) describe quantitative EEG (qEEG) modifications during pregnancy; (ii) investigate the potential association between qEEG modifications and the clinical course of epilepsy during pregnancy.

METHODS

We collected a cohort of WwE who underwent scalp EEG recordings during pregnancy. We measured power spectral density (PSD) and weighted phase-lag index (wPLI) as qEEG metrics (1-2). We evaluated the correlation between seizure frequency modification and qEEG changes during pregnancy. We compared qEEG metrics between seizure-free (SF) and non-SF WwE and qEEG changes according to clinical amelioration (seizure frequency reduction >50%) during pregnancy. Logistic regression was performed to test and compare the ability of clinical features, spectral metrics and connectivity metrics to classify our cohort of WwE according to clinical outcome during the last trimester of pregnancy (SF or non-SF).

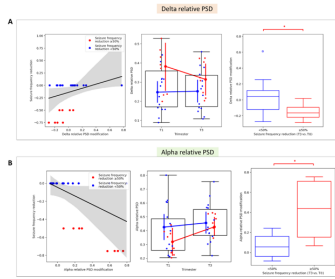


Fig 3

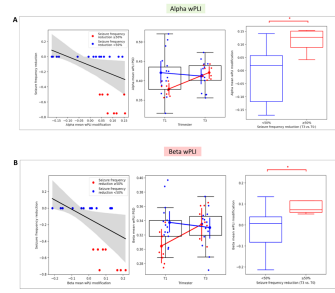


Fig 4

CONCLUSIONS

Pregnancy induces qEEG modifications potentially reflecting pregnancy-related neural network modifications or the altered pharmacokinetics. qEEG modulations parallel seizure frequency changes and clinical amelioration during pregnancy and may help to identifying SF WwE at the end of pregnancy. These findings could open new scenarios for the identification of promising biomarkers of the epilepsy clinical course during pregnancy.

References

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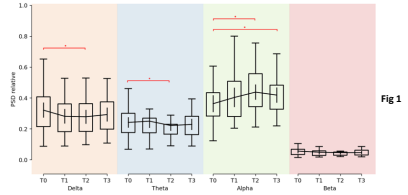


Fig 1

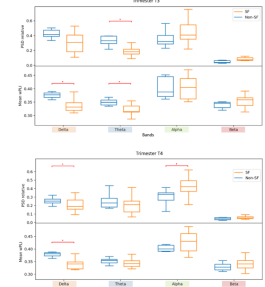


Fig 2

RESULTS

We enrolled 56 WwE (30.745.73 years). WwE exhibited a reduction of low frequencies PSD (delta and theta) and an augmentation of alpha PSD during pregnancy (Fig 1). At the third trimester, SF WwE exhibited augmented alpha PSD and wPLI and reduced low frequencies PSD and wPLI than non-SF (Fig 2). Delta PSD reduction, alpha PSD augmentation and alpha and beta wPLI augmentation were directly correlated to seizure frequency reduction during pregnancy (Fig 3-4). PSD and wPLI discriminated the variability of clinical outcome at the third trimester with a good level of accuracy (.83 ± .08) and gave the highest contribution to the final model accuracy compared to clinical features alone (Fig 5).

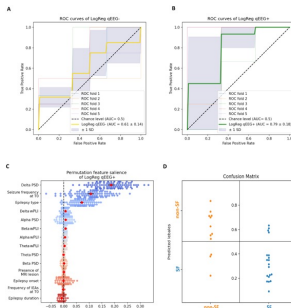


Fig 5



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