

# Pathophysiological insight into transient global amnesia from quantitative electroencephalography

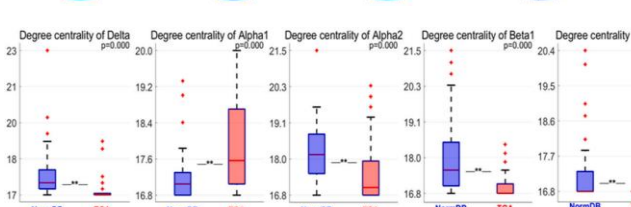
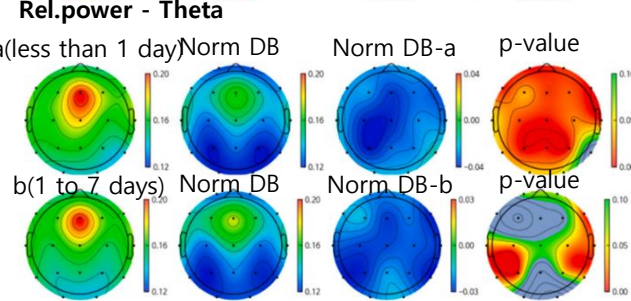
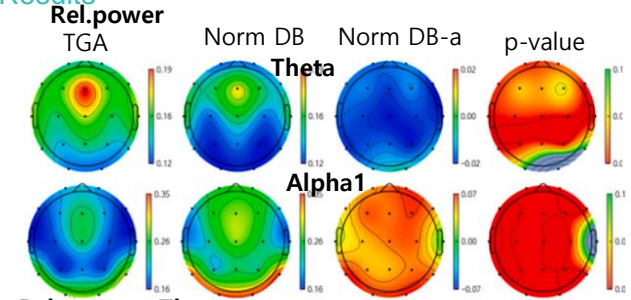
## Purpose

- Transient Global Amnesia (TGA) is a bipolar memory disorder with characteristic clinical and image features characterized by antecedent and retrograde amnesia, repetitive questions, and perceptions.
- Local lesions in the hippocampus and subsequent discontinuation of hippocampus-neocortical memory processing were associated with transient forgetfulness (TGA), and thus transient forgetfulness (TGA) was diagnosed with DW-MRI (Diffusion-Weighted Magnetic Resonance Imaging).
- However, DW-MRI can detect only half of Transient Global Amnesia (TGA) and is narrow lesions to detect.
- Previously, EEG was used to distinguish between epilepsy amnesia and Transient Global Amnesia (TGA).
- Therefore, the work to confirm the characteristics that can distinguish Transient Global Amnesia (TGA) through the power spectrum of QEEG and the network was done.

## Subjects / Methods

- TGA 215 participants (Male = 69 people, Female = 146 people)
- Conducted DW-MRI and EEG measurements.
- QEEG analysis is conducted using Normative DataBase, the health of EEG analysis software iSyncBrain (iMedisync Inc.).

## Results



[A Comparative Analysis of Healthy People VS TGA QEEG]  
- Compared to healthy person's Normal DataBase, TGA absolute power for all bands is reduced.  
- Relative alpha1 is less active, relative theta is more active.

[A Comparative Analysis of QEEG Over Time After TGA Symptoms]  
- In comparison of EEG acquisition time of 1 day or less (a), 1 day to 1 week (b), and 1 week or more (c) after TGA symptom onset, relative theta power increases less than 1 day and 1 week to 1 week.

[A Comparative Analysis of DW-MRI positive vs DW-MRI negative QEEG]  
Delta and beta1 power decreased more in DW-MRI positive than DW-MRI negative.

[A Comparative Analysis of QEEG according to Memory Loss Time]  
Groups with longer memory loss times have higher theta power than groups with shorter memory loss times.

[A Comparative Analysis of Healthy People VS TGA Networks]  
The network is weakened in most frequency bands of the TGA group, but more networks are formed in alpha1.

## Discussion

- Regardless of MRI abnormalities, TGA has a wide range of changes in brain activity compared to healthy people.
- TGA was less active in alpha1 but appears to be rewarded with an increase in the network.
- The confirmation of brain waves of TGA over time confirmed that significant changes in QEEG were maintained for up to 7 days after onset.
- The increase in theta of TGA is indicated by the weakening of alpha due to hippocampal dysfunction by disrupting the hippocampal-neocortical network.
- TGA with hippocampal lesions tends to inactivate delta and beta1 than TGA without hippocampal lesions, but QEEG changes are clear even in TGA without hippocampal lesions.
- Through this study, TGA provides evidence that extensive and long-term changes in brain activity are present, not personal and hippocampus dysfunction.
- The results of QEEG are also expected to have a significant impact on the diagnosis and treatment of TGA.