

INHIBITION IMPAIRMENTS IN TEMPORAL LOBE EPILEPSY PATIENTS: ELECTROENCEPHALOGRAPHY EVIDENCE FROM A GO/NOGO STUDY

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INTRODUCTION: Temporal lobe epilepsy (TLE) is a common type of epilepsy that easily run an intractable course. It can harm cognitive inhibition function, an essential executive function that enables us to suppress inappropriate actions in a given context at different levels. The aim of this study was to investigate whether TLE also affects related Go/Nogo-potentials related to the inhibition using high-resolution electroencephalography (EEG) technology.

METHODS: Participants were recruited in epilepsy clinics in Queen Mary Hospital, including refractory TLE patients (n=16), well-controlled TLE patients (n=11), and healthy control subjects (n=10). A Go/Nogo task was designed in which subjects were instructed to rapidly push a button in response to stimulus presentation. EEG data were collected by 128-channel Neuroscan system. The data were analysed by Neuroscan software.

RESULTS: We chose frontal for N2 detection in Go/Nogo task, central for Nogo P3 detection, and parietal for Go P3 detection. Analysis of variance showed that N2 amplitude in the Nogo condition was different among the three groups ($P=0.048$). Post-hoc analysis showed that the mean amplitude in the refractory TLE group ($-0.73 \pm 2.02 \mu\text{V}$) was smaller compared with healthy people ($-2.91 \pm 1.44 \mu\text{V}$), whereas the group effect was not significant in the Go condition ($P=0.48$). The P3 amplitude in the Nogo condition was significant ($P=0.042$). Post-hoc analysis indicated P3 amplitude in the refractory TLE patients ($1.40 \pm 1.86 \mu\text{V}$) was smaller than healthy people ($3.92 \pm 4.12 \mu\text{V}$). The group effect was also significant in the Go-P3 ($P=0.038$), healthy people ($2.89 \pm 2.05 \mu\text{V}$) had larger mean amplitude over refractory TLE patients ($0.75 \pm 1.51 \mu\text{V}$).

CONCLUSION: The event-related potential data suggest that there is selective impairment of inhibitory function in TLE. Impaired inhibitory executive function may lie in the frontal lobe.

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