

P94: Analysis of oscillatory brain activity in gamers and non-gamers during different cognitive tasks.

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Introduction: Some studies suggest that the pathological use of video games is related to high impulsivity and risky decision making.

Objectives: To analyze the EEG activity of compulsive gamers and non-gamers, while performing one inhibitory control and a decision-making task.

Materials and Methods: Participants were 34 individuals of both genders. Their mean age was 20.18 years old ($SD = 1.76$). An EEG recording was made after the participants filled in a Video Game Behavior questionnaire. During the EEG, the subjects performed the Williams Inhibition Test (WIT) and the Iowa Gambling Task (IGT). EEG power in delta, theta, alpha and beta frequency bands were measured by 18 derivation qEEG using Fast Fourier Transformation (FFT) over 5 seconds epochs selected from the EEG recording at resting with open eyes and during the tasks.

Results and Discussion: An increase in the theta power in frontal and central areas, accompanied by a reduction in the alpha power in posterior areas, was observed in the group of non-gamers and social gamers while performing the WIT. Possibly theta synchronization is related to pre-frontal lobe activation in the process of selective attention, while posterior alpha desynchronization with visual input. An increase in the front-central theta power was observed in the non-gamers and social gamers and in the group of problematic and pathological gamers while performing the IGT, probably related to the decision making process. The group of problematic and pathological gamers showed a significant difference in the IGT score and in the frequency of the B card when compared to the non-gamers and social gamers, suggesting that compulsive gamers could have poorer decision making abilities.

Conclusion: Frontal neuronal networks are activated during the IGT, while the WIT seems to activate the frontal-parietal areas. Results suggest that gamers may have different decision making abilities.