ALTERED CINGULATE-HIPPOCAMPAL SYNCHRONY CORRELATE WITH AGGRESSION IN ADOLESCENTS WITH INTERNET GAMING DISORDER

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Background. Internet gaming disorder is a pattern of excessive and prolonged internet gaming that results in a cluster of cognitive and behavioral symptoms, analogous to substance use disorder and gambling disorder. Previous studies suggest adolescents with internet gaming disorder, who often play for long periods without eating and sleeping, are characterized by aggression and poor self-control. However, the neural bases of the link between excessive internet gaming and aggression, which are expected to affect or be affected by each other, are still under debate.

Method. We used functional magnetic resonance imaging to investigate how emotional stimuli (angry faces) interfered the performance and neural activity during a Stroop match-to-sample task in 18 male adolescents with internet gaming disorder (mean age = 13.6 years old, SD = 0.9) and 18 age- and sex-matched healthy controls.

Results. The internet gaming disorder group showed longer reaction time and lower accuracy in emotionally interfered conditions compared to the healthy control group. In emotionally interfered conditions, the internet gaming disorder group exhibited increased activations in areas involved in face perception (fusiform gyrus) and emotional face processing (insula, amygdala-hippocampus), whereas the healthy control group exhibited increased activations in areas involved in cognitive control (dorsomedial prefrontal cortex; dACC) and selective attention (frontal eye fields, posterior parietal cortex). Stronger functional connectivity between the dACC and amygdala-hippocampus complex correlated with lower aggression.

Conclusions. These results indicate that the stronger top-down cognitive control over emotional interference was impaired in adolescents with internet game disorder, which might contribute to aggression and poor self control.