EEG theta/beta ratio as a biomarker for attentional control and its test-retest reliability.

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Abstract

A robust finding is that resting-state frontal theta/beta ratio (TBR), a spontaneous electroencephalographic (EEG) frequency band parameter, is increased in attention-deficit/hyperactivity disorder. Accumulating evidence suggests that TBR might also provide an objective marker of executive cognitive control (and more specifically attentional control; AC) in healthy adults. The present study aimed to further investigate this conception by assessing EEG frequency band power and AC twice (with a one-week interval) in 41 young female adults. In line with our predictions, the negative association between TBR and trait AC, as measured with an often used self-report measure, was replicated. Results also demonstrated that test-retest reliability of resting-state frontal TBR was very good ($r=0.93$) and, moreover, TBR measured at the first session predicted AC during the second session ($r=-0.44$). These consistent results further reinforce the notion that frontal TBR could be used as a reliable biomarker for prefrontally-mediated executive AC.