

Atypical attentional cortical activity during resting in teenagers with Developmental Coordination Disorder (DCD): A pilot EEG study

Aim. The present study aims to investigate attentional cortical activity during resting in teenagers with DCD.

Background. Even if DCD is characterized by deficits in motor skills well-established at clinical and scientific levels, these children also present cognitive difficulties. In particular, the literature suggests that attentional processes could be altered in DCD children. However, all studies interested in attention in DCD use paradigms inducing motor responses, which limits possibility to explore attention independently of motor control. In order to investigate the possible attentional deficits in DCD children, we propose to record cortical activity related to attentional processes during a resting task.

Method. Firstly, attentional and motor levels were evaluated, with the CPT II and M-ABC tests respectively. Secondly, ElectroEncephaloGraphic (EEG) data were recorded in 6 typically-developing (TD) children and 10 DCD children during one minute of resting with eyes open (EO) and one minute of resting with eyes closed (EC). Spectral Power of the EEG oscillations were computed in the low and high alpha band (8-10 Hz and 10-12 Hz, respectively) over the parietal cortex in order to reflect the diffuse and focused attentional processes, respectively. ANOVAs Group (DCD vs TD) x Condition (EO vs EC) were carried out on low and high alpha spectral powers. Correlations between levels of low and high alpha EEG power and (1) CPT II and (2) M-ABC scores were computed. The p value was fixed at 0.05.

Preliminary results. A significant Group x Condition revealed that high alpha spectral power was lower in EO compared to EC, but less in DCD teenagers. No difference was found for the low alpha band. No correlation was significant.

Discussion. DCD children present specific atypical attentional cortical activity at rest. Focused attention (10-12 Hz) seems to be more altered than diffuse attention (8-10 Hz).

Conclusion. Even if these preliminary results have to be confirmed with a larger sample size, they encourage us to explore more precisely the resting attentional cortical network in DCD. In particular, the link between the atypical resting brain activity of teenagers with DCD and their behavioral attentional or motor levels remain to be investigated further.

Keywords: parietal cortex, alpha oscillations, focused attention, spectral power