Association of preterm birth with ADHD-like cognitive impairments and additional subtle impairments in attention and arousal malleability.


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Abstract

BACKGROUND:
Whilst preterm-born individuals have an increased risk of developing attention-deficit/hyperactivity disorder (ADHD), and are reported to have ADHD-like attention and arousal impairments, direct group comparisons are scarce.

METHODS:
We directly compared preterm-born adolescents (n = 186) to term-born adolescents with ADHD (n = 69), and term-born controls (n = 135), aged 11-23, on cognitive-performance, event-related potential and skin conductance level (SCL) measures associated with attention and arousal. The measures are from baseline and fast-incentive conditions of a four-choice reaction time task, previously shown to discriminate between the individuals with ADHD and controls. We aimed to establish whether preterm-born adolescents show: (a) identical cognitive-neurophysiological impairments to term-born adolescents with ADHD (b) possible additional impairments, and whether (c) the observed impairments correlate with ADHD symptom scores.

RESULTS:
The preterm group, like the term-born ADHD group, showed increased mean reaction time (MRT) and reaction time variability (RTV) in the baseline condition, and attenuated contingent negative variation (CNV) amplitude (response preparation) in the fast-incentive condition. The preterm group, only, did not show significant within-group adjustments in P3 amplitude (attention allocation) and SCL (peripheral arousal). Dimensional analyses showed that ADHD symptoms scores correlated significantly with MRT, RTV and CNV amplitude only.

CONCLUSIONS:
We find impairments in cognition and brain function in preterm-born adolescents that are linked to increased ADHD symptoms, as well as further impairments, in lack of malleability in neurophysiological processes. Our findings indicate that such impairments extend at least to adolescence. Future studies should extend these investigations into adulthood.