POSTURAL STABILITY AND RELIANCE ON VISUAL CONTEXT DIFFER BETWEEN AUTISM SPECTRUM DISORDER, DEVELOPMENTAL COORDINATION DISORDER, AND TYPICAL DEVELOPMENT

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Abstract:
People with Autism Spectrum Disorder (ASD) and Developmental Coordination Disorder (DCD) have similar difficulties in balance and motor control, but not much is known about how their vision influences their body movement. Atypicalities in functional motor performance in ASD and DCD may be driven by differences in visuomotor integration, or the use of visual information to guide movement. We collected Center of Pressure (CoP) data from 10 children with ASD (M_{Age} = 11.30 , SD_{Age} =2.50), 8 children with DCD (M_{Age} =9.00 , SD_{Age} = 1.51), and 10 TD children (M_{Age} = 10.30, SD_{Age} = 2.45) while standing on a stationary force plate (BioSway, Biodex Corp, Shelby, NY) and performing two balance tasks. We measured eye movement using mobile eye-tracking glasses (ETG 2.5w, SensoMotoric Instruments, Boston, MA). The first task–the Clinical Test of Sensory Integration and Balance (CTSIB)–involved standing on the platform for 30 seconds with eyes open, 30 seconds with eyes closed, and 30 seconds with eyes open while their head was inside a translucent paper dome. The second task tested the limits of their stability by prompting the participant to match a user-controlled object on a screen to each of 9 targets. The TD group had better postural stability during both games compared to the ASD and DCD groups. When all three CTSIB conditions were collapsed, the ASD group had marginally lower stability than the TD group (p = 0.11). In the dome condition, the ASD group had significantly lower stability than the TD group (p = 0.04), suggesting that they had a more difficult process of sustaining balance. In the limits of stability task, the ASD and DCD groups did not differ in their postural control (p = 0.33), but the TD group had significantly better control than the clinical groups (ps = 0.03). We concluded that the two clinical groups had more difficulty maintaining and controlling postural ability than the TD group in the CTSIB and limits of stability tasks. Future studies will analyze eye-tracking data to investigate the role of visuomotor integration in these group differences.

Keywords: *Postural stability, center of pressure, Autism Spectrum Disorder (ASD), Developmental Coordination Disorder (DCD)*