Reduced Autonomic Response to Pleasant Touch in ASD Children

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Abstract

Touch includes different aspects like discrimination and affective components. Affective touch, mediated by CT-fibers of the hairy skin and essential in the development of interpersonal non-verbal interactions, could be affected in some neurodevelopmental disorders such as Autism Spectrum Disorders (ASD). Previous studies have shown that affective touch can evoke measurable ANS responses, however it has never been tested in ASD patients. We aimed at measuring ANS responses during pleasant tactile stimulation targeting the affective and/or the discriminative tactile pathways in ASD children and typically developing (TD) children. We recruited twenty 6-12 years old ASD children (108±16 months; 18 males) and twenty TD age-matched children (111±18 months; 7 males). We performed 10 stimulations (four seconds each) on the forearm (high CT-fibers density) and 10 stimulations on the palm of the hand (very low CT-fibers density) with a soft texture tool. We recorded simultaneously: pupil diameter, skin conductance, and heart rate. Participants looked at a screen for the whole length of the procedure while staying still on the armchair. We showed that our pleasant stimulation evoked a heart rate deceleration, larger in TD than in ASD children ($p < 0.01$). We also found a reduced SCR latency ($p < 0.05$) and larger SCR amplitude ($p < 0.01$) in TD compared to ASD children. The small sample of ASD children with a pupil recording due to head movements prevented any significant statistical analysis, even if pupil dilation following the tactile stimulation seemed reduced in ASD compared to TD children.

Keywords: autonomic nervous system, autism, skin conductance, heart rate, pupil diameter

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