

2021 Gatlinburg Conference Poster Submission

Title: Investigating the two-hit model of autism: Puberty and peer-relations predicted depressive symptoms in autistic males

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Introduction: Puberty is a sensitive developmental period for adolescents and may be particularly challenging for autistic adolescents who are navigating physical changes and friendship milieu. The two-hit model of autism postulates that puberty may exacerbate internalizing problems in autistic adolescents (Picci & Scherf, 2015). We investigated male adolescents because risk mechanisms typically supported for female adolescents (i.e., body image associated with early maturation) do not translate easily to males. Neurobiological systems that drive changes in secondary sexual characteristics (e.g., acne, voice deepening) may interact with social processes within peer socialization, heightening interpersonal challenges.

Method: We investigated puberty and key autism features (i.e., restricted interests [RI], repetitive behaviors [RB]) in the development of depressive symptoms. Participants included 43 typically developing (TD) and 30 autistic (ASD) male adolescents, ages 11 to 17 years. We investigated group differences in depressive symptoms, and then, within each group, tested if depressive symptoms were predicted by pubertal development using the Pubertal Development Scale metric for adrenal-driven (PDSA: acne, pubic hair) and gonadal-driven development (PDSG: growth spurt, voice deepening, facial hair; Shirtcliff et al., 2009), as well as salivary testosterone. We then investigated if social challenges (peer socialization, social-emotional reciprocity, and social competence), RBs (i.e., self-injurious behavior, compulsive behavior, ritualistic behavior), and RI intensity predicted depressive symptoms within each group, and if puberty moderated these relationships.

Results: Autistic males had greater depressive symptoms than TD males ($b=4.90$, $p=0.026$). Across groups, PDSA predicted depressive symptoms ($b=2.07$, $p=0.032$). Neither PDSG nor testosterone predicted depressive symptoms. Autistic males had greater depressive symptoms when they had more developed PDSA ($b=4.41$, $p=0.008$), poorer social competence ($b=5.71$, $p=0.02$), greater peer socialization difficulties ($b=7.44$, $p=0.041$), greater total RBs ($b=3.81$, $p=0.064$), and more intense RIs ($b=4.79$, $p=0.014$). Targeting specific RBs, compulsive ($b=4.13$, $p=0.009$), ritualistic ($b=3.73$, $p=0.029$), and self-injurious ($b=3.38$, $p=0.013$) behaviors predicted greater depressive symptoms for ASD males. For TD males, social behaviors did not predict depressive symptoms.

Across the full sample, puberty moderated the predictive relationship between RB subtypes and depressive symptoms. Males who engaged in greater total RBs and had more developed PDSA had moderately greater depressive symptoms ($b=2.02$, $p=0.052$). Males who engaged in greater self-injurious RBs and had more developed PDSA had greater depressive symptoms ($b=1.98$, $p=0.018$). The relationship between compulsive and ritualistic RBs ($b=2.00$, $p=0.05$, $b=1.79$, $p=0.082$, respectively), and depressive symptoms were partly moderated by PDSA. Lastly, males who had more intense RIs and more developed PDSA had greater depressive symptoms ($b=2.20$, $p=0.043$).

Discussion: Early pubertal maturation is an established risk factor for depression in females, due in part to peer and body image challenges, but males are thought to be protected because pubertal maturation is viewed positively. Our study challenges this assumption and both supports and extends the two-hit model of autism by showing that autistic adolescent males are at risk for elevated depression, that peer difficulties and key autism features may presage depressive symptoms, and that pubertal development moderates this relationship across male groups. Further studies investigating depressive symptoms in vulnerable males seems warranted.

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References:

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