

**#3085 Title: Relationship between variant connective tissue (hypermobility) and autism sensory processing: Externally oriented thinking as a mediator**

**Authors:** Savage, GK<sup>1,2</sup>; Csecs JLL<sup>1,2</sup>; Davies G<sup>1,2</sup>; Critchley, HD<sup>1,2,3</sup>; Eccles, JA<sup>1,2</sup>

1. Department of Neuroscience, Brighton and Sussex Medical School, UK

2. Sussex Partnership NHS Foundation Trust, Sussex, UK

3. Sackler Centre for Consciousness Science, University of Sussex, UK

**Objectives/aims**

Autism is a neurodevelopmental condition characterised by differences in sensory processing, social communication and restricted/repetitive behaviors. Joint hypermobility is a common connective tissue variant, reportedly overrepresented in Autism. Alexithymia is a personality construct characterised by altered emotional awareness which has notably high rates of overlap with autism spectrum disorder. This study tested whether hypermobility was associated with autistic traits and examined alexithymia as a mediator of this association.

**Method**

Forty-two people underwent eligibility assessment for a study of joint hypermobility and anxiety (ISRCTN17018615). Hypermobility was assessed using both the Brighton Criteria for Joint Hypermobility Syndrome (JHS) and 2017 Hypermobile Ehlers Danlos Syndrome (hEDS) Criteria. Participants completed the Ritvo Autism Asperger Diagnostic Scale-Revised (RAADS R: sensory/motor, language, social relatedness and circumscribed interest domains) to quantify autistic traits. No participant had a prior diagnosis of Autism. Participants also completed the Toronto Alexithymia Scale (TAS-20) to measure alexithymia. The TAS-20 has three domains: difficulty describing feelings, difficulty identifying feelings and externally oriented thinking.

**Results**

All 42 participants met criteria for JHS, 26 participants also met criteria for hEDS. Strikingly, 22/42 (52.4%) scored above threshold for suspected Autism (26/42 in the sensory/motor domain; 22/42 in language domain; 22/42 in social relatedness domain; 17/42 in circumscribed interests domain). There were no significant differences in RAADS-R scores depending on hypermobility diagnosis. The number of connective tissue features (hEDS Criterion 2A) correlated with RAADS-R sensory/motor score ( $r = 0.418$ ,  $p = 0.006$ ) but not social relatedness nor circumscribed interests sub-scores. Full mediation of the relationship between the number of connective tissue features and RAADS-R sensory/motor score by TAS-20 externally oriented thinking was found using the method of Baron-Kenny (1986) and estimation of indirect effects (Hayes, 2018; bootstrapped confidence intervals ( $n = 5000$ , do not cross zero)). Difficulty identifying feelings and difficulty describing feelings domains did not mediate this relationship.

**Conclusion**

These results add to evidence linking variant connective tissue to neurodevelopmental conditions (including Autism) and interestingly, specifically to sensory processing differences. Our study provides a strong rationale for screening for neurodevelopmental conditions in people with hypermobility and motivates further to

understand symptom expression in this group. Our results also provide an insight into the processes underlying this relationship, which maybe important for informing interventions for people with hypermobility and autistic traits.