Sensory Sensitivities in Individuals with Tics and Tourette's Syndrome: Early Responses in an Ongoing Project

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Objective

This study aims to explore patterns of sensory sensitivity in patients with tics and Tourette's Syndrome (TS) to gain insight into this potentially under-reported phenomenon.

Methods

We administered the GSQ (12 y≤) or P-GSQ (11 y≥) to patients presenting to clinic with diagnoses of tic disorder or TS. Patients with functional neurologic disorder diagnosis were excluded. Participants were then divided into pediatric (3-11 y), adolescent (12-17 y), and adult (≥18 y) cohorts.

Demographics		
Total Participants		n=10
Sex	Male	n=6 (60%)
	Female	n=4 (40%)
Age	Range	16-43
	Mean	23.9
	Median	21
Cohort	Pediatric	n=0
	Adolescent	n=1
	Adult	n=9
Race	White	n=10
Diagnosis	TS	n=8
	Motor Tic	n=2
	Vocal Tic	n=0

Table 1: Demographic information of 10 participants. 60% of participants are male with 40% female. The average age of patients was 23.9 years old. 80% of patients have been diagnosed with TS and 20% are diagnosed with motor tic disorder.

Results

We have enrolled 10 patients to date (1 in the adolescent cohort and 9 in the adult cohort) with planned enrollment of 100 patients. For GSQ survey responses, the average score was 49 out of a possible 168, which is above the normative mean 38.3 of "neurotypical" populations yet below the normative mean 55.1 of persons with autism spectrum disorder.

When specific sensory modalities are investigated, it appears auditory, vestibular, and visual modalities are most prominently affected, followed by tactile, olfactory, gustatory, and proprioceptive modalities.

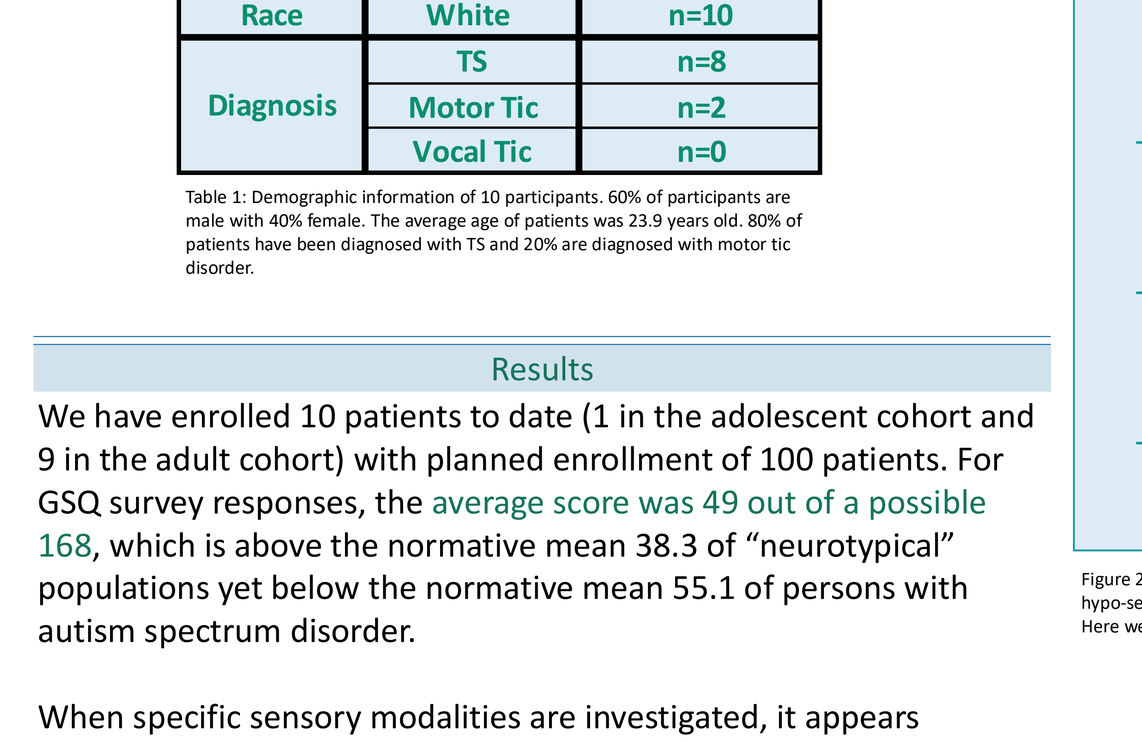

Figure 1: This figure demonstrates novel questions that were posed to participants on the basis of anecdotal findings of increased tactile and auditory sensory sensitivities in patients with TS and tic disorders. Question 1 asks: "Do you feel particularly sensitive to certain textures, such as being unable to wear certain things because the material is uncomfortable, or owning many items of the same material that is tolerable?" Question 2 asks: "Are you especially bothered by elastic bands in clothing or underwear?" Question 3 asks: "Are you especially bothered by the lines in your socks?" Question 4 asks: "Do you feel like you are more sensitive to certain sounds than other people?" Lastly, question 5 asks: "Do you feel like loud noises bother you more than they bother most people?"

Background

Patients with tics and TS have been described in small studies to experience heightened sensitivity to tactile, auditory, and visual stimuli. This may be a result of dysfunction in sensory processing rather than lowered sensory thresholds. The prevalence of increased sensory sensitivities in children and adults with tic disorders and TS is not yet known.

The Glasgow Sensory Questionnaire (GSQ) and parent completed GSQ (P-GSQ) are self administered tools (42 questions with 5 frequency ratings) used in patients with Autism Spectrum Disorders (ASD) to evaluate sensory sensitivities.

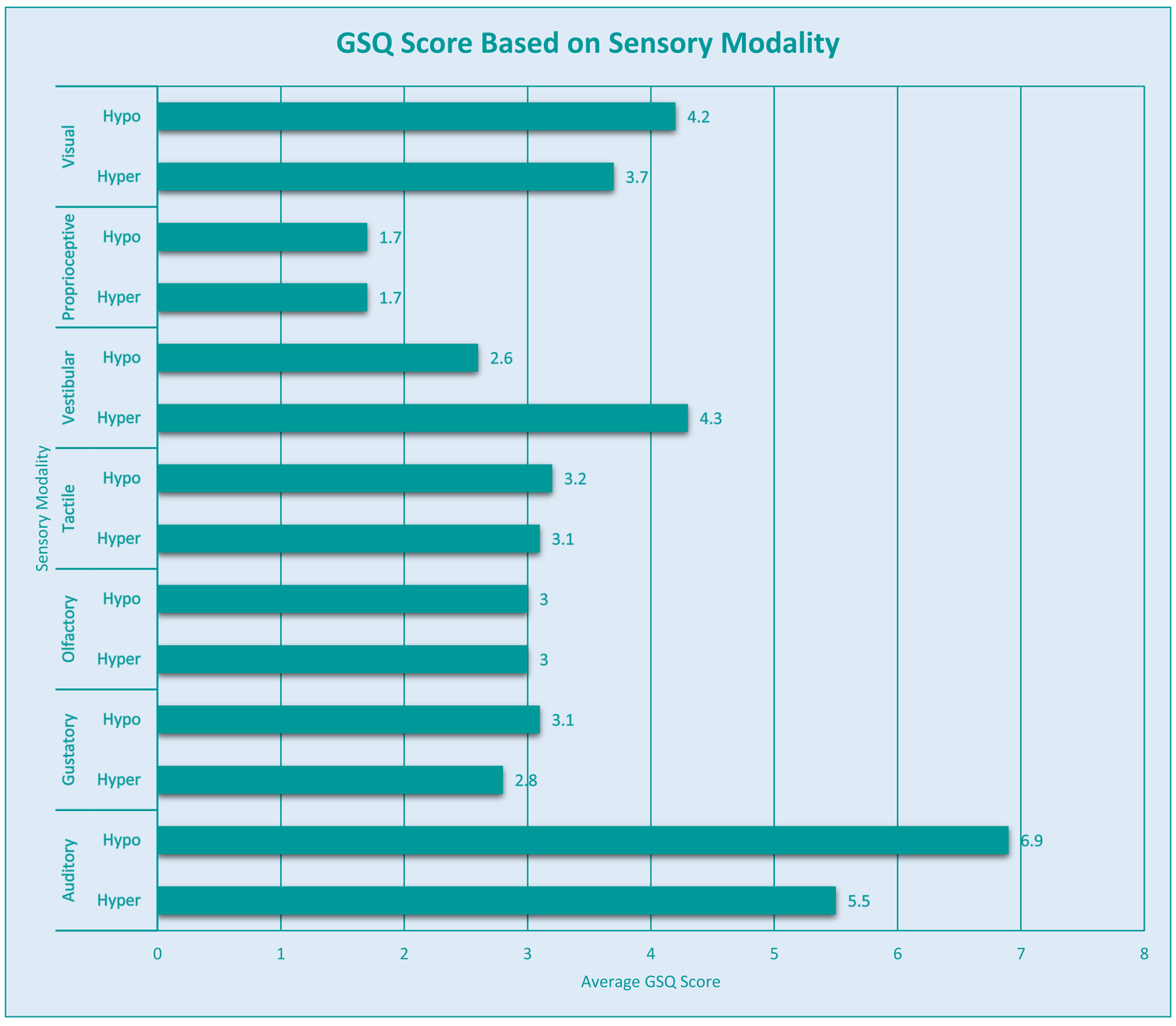

Figure 2: This demonstrates the mean scores for each sensory modality of the GSQ. There are 7 Sensory modalities which are further subdivided into hyper-sensitive groups and hypo-sensitive groups. Responses to a Likert scale of "Never, Rarely, Sometimes, Often, Always" correspond to values 0-4, leaving each subdivision a score out of a possible 12 points. Here we demonstrate that auditory hyposensitivity is the leading sensory processing dysregulation followed by auditory hypersensitivity.

Conclusions

There are prominent findings of sensory processing dysfunction demonstrated in patients with TS and tics. The total average GSQ score is in the range that is greater than the normative standard but below the range typically seen in persons with autism spectrum disorder. The most notable of which is auditory sensory stimuli followed closely by visual and vestibular.

As more patients enroll, we will be able to investigate the changes in these trends as they relate to age cohorts, as we anticipate that the pediatric population will have higher scores in comparison with the adolescent and

More work needs to be completed to investigate the prominence of these sensory modalities, with detailed focus into the role comorbidities (autism spectrum disorder, ADHD, OCD, and anxiety/depression) have on responses of patients with TS and tics.

We will additionally review our novel questions based on anecdotal evidence to see if they have a role in screening for sensory sensitivity in patients with TS and tic disorders.

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