

The sensory side of Tourette's disorder



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About the author –

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“David, Please get your boots on!”

When I first met David, an 8-year-old boy, and his mother Shirley, I was struck by David's many motor and vocal tics as well as his hyperactivity. Along with symptoms suggestive of Tourette's disorder (TD) and attention deficit hyperactivity disorder (ADHD), Shirley complained of David's extreme reactions to particular sensory input. She described daily struggles about getting dressed that included David complaining that his “socks, pants, and tops didn't feel right”. During the winter months,

David and Shirley's morning routine always included a struggle that centred on David's discomfort with wearing winter boots, a necessity in Winnipeg! For about an hour, David struggled to feel comfortable, moving his feet in and out of his boots repeatedly. Finally, when he kept his boots on, David would stomp around the apartment until he was satisfied with how the boots felt. This “boot ritual” would often make him late for school, disturb the neighbours, and create family tension.

What is Tourette's disorder?

TD is a childhood-onset neurodevelopmental disorder characterized by multiple motor and vocal tics. To strictly meet the diagnostic criteria, an individual must demonstrate at least two motor tics and at least one vocal tic. The onset of these symptoms must occur before 18 years of age and must have lasted at least one year (American Psychiatric Association, 1994). TD is commonly associated with other disorders, most frequently ADHD (62% co-morbidity), learning disorders (LD) (26%) and obsessive compulsive disorder (OCD) (20%) (Tourette Syndrome Foundation of Canada, 2006). Once thought to be rare, the incidence of TD is

now felt to be one in every 100-200 people (Tourette Syndrome Foundation of Canada). This article will provide information about my initial assessment of David, the questions his sensory issues, and those of many other children with TD, raised for me, and some answers I have found.

Learning more about David

As the occupational therapist on a multidisciplinary team working with children with TD, I gathered collateral information from David's school about his overall performance in that setting and interviewed David and Shirley to identify and prioritize occupational performance issues. I then asked Shirley to complete a Sensory Profile Caregiver Questionnaire (Dunn, 1999) to obtain a clearer understanding of his sensory processing patterns. Information from all sources made it clear that David's unique combination of sensory avoiding and sensory seeking behaviours were not just interfering with dressing, but with learning new motor skills (riding a bike), focusing in the classroom, and controlling his behaviour in stimulating environments like the lunch room. Also of note were his tics, in particular his eye-blinking tic, which increased in frequency when in emotionally and environmentally stimulating environments.

Persistent questions nagged me during my involvement with David and the many other clients just like him: Are there unique sensory differences in individuals with TD? If sensory differences exist, are they related to TD specifically or are they more related to the associated disorders that commonly accompany TD? What role do sensory issues play, if any, in the expression of tics?

What the literature says about sensory issues and TD

A review of the literature reveals a mix of clinical accounts and neurological evidence for atypical sensory experiences in individuals with TD. The most frequent clinical accounts relate to sensory urges that precede tics. Many individuals with TD, typically over the age of ten years old, describe an odd sensory feeling that compels them to complete a tic. They often describe the tic as a voluntary response to an involuntary sensa-

tion, like an itch that needs to be scratched (Kwak, Dat Vuong, & Jankovic, 2003; Leckman & Cohen, 1999). Other accounts from individuals with TD are more related to being sensitive to external sensory information. Some report unconsciously copying the movements (echopraxia) or speech (echolalia) of others. There are also clinical accounts of both children and adults with TD being more sensitive to, or distressed by, certain clothing items (Leckman & Cohen; Waltz, 2001) or who report that their tics are triggered by certain sounds or images (Home Box Office, Inc and Tourette Syndrome Association, Inc. 2005)

Literature regarding the neurology of TD presents an interesting picture. Studies have indicated that there are no differences in sensory functions in individuals with tics upon neurological examination (Abbruzze & Berardelli, 2003). However, there is consistent evidence of subtle basal ganglia abnormalities and disturbances in neural pathways between the basal ganglia and other parts of the brain involved in the regulation of movement. (Abbruzze & Berardelli; Albin & Mink, 2006; Leckmann & Cohen, 1999). There is also recent evidence of cortical thinning in the sensorimotor cortices of children with TD (Sowell et al., 2008). It is thought that these brain differences contribute to impaired motor control as well as the sensory urges that commonly precede tics (Nowak et al., 2005; Sowell et al.).

Sensory issues in disorders related to TD

A review of sensory issues related to the top three conditions co-morbid with TD (ADHD, LD, and OCD) indicates one or more of the conditions may, indeed, be contributing to the sensory picture of individuals with TD plus one or more associated conditions (TD+). Growing evidence demonstrates a number of atypical sensory responsiveness in children with ADHD (Dunn & Bennett, 2002; Mangeot et al., 2001; Parush et al., 2007; Yochman, Parush, & Ornoy, 2004). There are also an abundance of studies in the LD field suggesting differences in visual, tactile, and auditory processing (Hulslander et al., 2004). Most recently, sensory intolerance has been identified as the driving behaviour behind at least a subset of children diagnosed with OCD (Hazen et al., 2008).

Searching for more answers

To clarify and advance the understanding of sensory issues in children diagnosed with TD, I undertook to examine sensory processing patterns of 75 participants diagnosed with TD and TD plus ADHD. Preliminary results suggest that children with TD do indeed dem-

onstrate atypical sensory responses that are magnified with the presence of ADHD. A forthcoming manuscript will fully describe the findings of this research and implications for occupational therapy.

Conclusion

Through my clinical and scientific journey, I have been led to believe that sensory issues do affect the behaviour of individuals diagnosed with TD. Assessment of sensory processing differences should be a standard component of clinical practice. Occupational therapy intervention aimed at modulating differences in sensory responsiveness in children like David could potentially decrease tic expression and help resolve disruptive behaviours like “the battle of the boots”. Perhaps my journey has just begun.

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