Motor Stereotypies Arise Early, Remain Persistent

BY JEFF EVANS
Senior Writer

BALTIMORE — Motor stereotypies can affect otherwise normal children at an early age and persist at least through adolescence, but may be amenable to behavioral therapy and some medications, Dr. Harvey S. Singer said at a meeting on developmental disabilities sponsored by Johns Hopkins University.

The presence of motor stereotypies is more commonly known in children with developmental disorders than in healthy children, but research has not yet pinpointed any specific differences in the biology or types of movements that occur in patients with these repetitive movements, said Dr. Singer, professor of pediatric neurology at the university.

Stereotypies seem to fall into two major groups, according to Dr. Singer. One group is repetitive movements with a pathologic basis, commonly found in people with autism, mental retardation, and sensory deprivations (for example, blind or deaf individuals). Behaviors with a physiologic underpinning are commonly found in healthy people—rocking, pencil tapping, biting/chewing—and can involve head (nodding) or complex movements.

Dr. Singer and his colleagues recently finished updating a report on the characteristics of repetitive arm and hand movements that they had previously published on 40 children (J. Pediatr. 2004;145:391-5). The updated study, now with 81 children total, included 56 (69%) patients with stereotypy onset at younger than age 24 months, 19 (23%) at age 24-35 months, and 6 (8%) at age 36 months or older. None of the children had mental retardation or pervasive developmental disorders.

The stereotypies seen in these children were associated especially with periods of engrossment such as when playing a game or participating in an activity, but also at times of excitement, stress, fatigue, and boredom. They usually lasted in the range of seconds to minutes (but could go on for hours in some cases) and appeared many times per day. In practically all cases, the stereotypies could be suppressed by sensory stimuli or distraction. Most children—but not parents—reported that these behaviors were of little concern and were not bothersome.

Most of the parents whose children were referred to Dr. Singer said that they had been told by other physicians that their child would stop doing their stereotypy, but these repetitive movements continue for most children into adolescence and beyond, he said.

In follow-up averaging about 6.5 years after onset of the stereotypy, the movements remained unchanged in 44 children (54%), grew worse in 7 (9%), improved in 26 (32%), and completely resolved in 4 (5%). Most (60%) patients had follow-up of more than 5 years.

It is possible for a child with a stereotypy to subsequently develop a tic at a later age, Dr. Singer pointed out.

Stereotypies usually develop in early life, mostly before 2 years of age, whereas tics begin to occur in children at age 6-7 years. Unlike tics, which rapidly change from one thing to another (blinks, grimaces, twists, shrugs), stereotypies are prolonged episodes of the same iterated movement. Some people with tic disorders feel a premonitory urge, but this does not happen with stereotypies. People with a tic disorder often will stop their tics during engrossing activities, but individuals with stereotypies will start their repetitive movements during such periods. Distraction usually interrupts stereotypies but not tics.

Many of the children in the study had a comorbidity, including ADHD (15%), obsessive-compulsive disorder or obsessive-compulsive behavior (20%), tics (13%), learning disability (4%), or had an early language or motor developmental delay that resolved itself (12%).

Overall, 20% of the children had a family history of stereotypies. A substantial percentage of the children had a family history of ADHD (12%), tic disorders (27%), mood-anxiety disorders (27%), and/or other neurologic disorders (22%).

The biologic basis for stereotypies remains unclear, although some evidence suggest that there is a dysfunction in the circuitry between the cortex and the striatum, he said (Pediatr. Neurol. 2005;32:109-12).

If a child's stereotypy doesn't interfere with his activity, Dr. Singer said that he doesn't recommend any particular therapy. The autistic literature has a long list of drugs to try, including benzodiazepines, β-adrenergic agonists, antipsychotics, and SSRIs. About half of autistic children with self-injurious behaviors, including some with stereotypic movements, respond better with neuroleptics than with SSRIs, although the difference is not large, he said.

Dr. Singer and his colleagues recently reported improvement in the frequency, intensity, and number of stereotypies in an open trial of 12 nonautistic children with physiologic motor stereotypies who received habit reversal training. They taught the children to be aware of their stereotypy by learning to exhibit the movement voluntarily and then to learn to inhibit the behavior through the reinforcement of a competing behavior (J. Child Neurol. 2006;21:119-25). ■

MRI Study Links Anterior Thalamocortical Tract Abnormalities to Learning Disabilities

BY AMY ROTHMAN SCHONFELD
Contributing Writer

MONTREAL — Volumetric measurement of the brains of children with learning disabilities of unknown etiology has revealed subtle abnormalities in regions associated with the anterior thalamocortical tract that correlate with the severity of the learning disability, according to a report that merited the Best Abstract Award in a Clinical Topic at the 10th International Child Neurology Congress.

This Finnish study examined 122 children (average age, 12 years) who had learning problems that ranged from mild specific disabilities to severe intellectual limitations. A group of 43 children in mainstream education served as controls, said Dr. Taina Autti, who is with the Helsinki Medical Imaging Center and Helsinki University Central Hospital.

The children underwent conventional magnetic resonance imaging with a 1.5-tesla magnet.

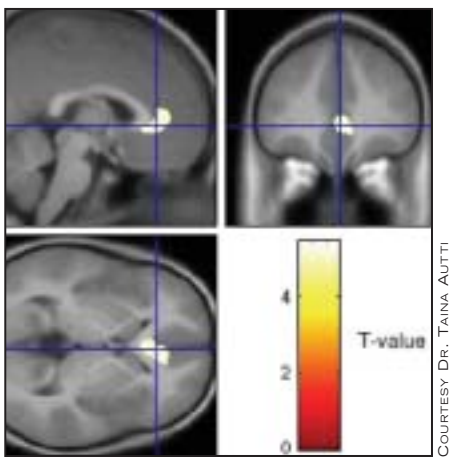
Three-dimensional images were then generated for volumetric analyses, and fluid-attenuated inversion recovery (FLAIR) and T2-weighted coronal images were examined for possible abnormalities. Voxel-based morphometry was used to compare local volumes of gray matter, white matter, and cerebrospinal fluid between study groups. Each voxel was 1 mm^3.

Thirteen children were found to have structural abnormalities, such as optic glioma, enlarged ventricles, enlarged sulci, and vermis atrophy, and were eliminated from further analysis. For the remaining 152 participants, conventional MRI showed no apparent gross structural abnormalities.

When the investigators searched for brain areas where local volume correlated with degree of learning disability, several regions stood out:

- In the anterior cingulate cortex, a significant positive correlation was found with gray matter volume (Tmax = 5.50, $P < .001$). (See images.)
- In the left frontoparietal lobe, a significant positive correlation was found with white matter volume (Tmax = 5.34, $P < .001$).
- In the left thalamus, a significant negative correlation was found with gray matter volume (Tmax = 5.26, $P < .001$).
- In the posterior internal capsules, a significant negative correlation was found with white matter volume (TmaxRight = 5.57, $P < .001$; TmaxLeft = 5.20, $P < .001$).

The study findings indicate dysfunction of the anterior thalamocortical tracts, which begin in the anterior mediodorsal nucleus of the thalamus, pass through the anterior internal capsule, and terminate in the anterior cingulate gyrus or prefrontal cortex, according to Dr. Autti.



COURTESY DR. TAINA AUTTI

The white area represents the enlarged anterior cingulate cortex overlaid on the average MRI of all subjects.

The anterior cingulate cortex plays a central role in many cognitive tasks—functions that are often disturbed in children with learning disabilities, Dr. Autti said. These include cognitive flexibility, initiation of appropriate behaviors, suppression of inappropriate behaviors, attentiveness, adaptability, alertness, motivation, fluid thought transfer, and the ability to evaluate options and make choices. "The greater gray volume in the anterior cingulate cortex may be the unifying feature in learning disabilities of unexplained, familial etiology," Dr. Autti said. ■

Direct Approach Works With Eating Disorder Patients

VANCOUVER, B.C. — It's hard to know just what to expect—or what to say—when you turn the examining room doorknob for an initial encounter with a patient who has a suspected eating disorder.

"You could have somebody who at best is extremely ambivalent about being there, at worst maybe very, very angry and upset about being there," psychologist Ronald S. Manley said at a conference sponsored by the North Pacific Pediatric Society.

Dr. Manley begins by offering a simplistic, research-based explanation of eating disorders, including the motivations behind them, their symptoms, and what models have been used to treat them, said Dr. Manley, clinical director of the eating disorders program at British Columbia Children's Hospital.

Using an emotional orientation, he draws on "relatively strong language" to forge a connection with the adolescent that hopefully will assist her in finding the part of herself that does want help. As an example, he might say, "Anorexia nervosa brings something to you that's very important. Why else would you hold onto it? … It's a powerful means of coping with your fears and gives you a sense of being strong and in control. But it is also a cause of suffering and weakness. And a sign of someone deeply troubled."

In being blunt, "I'm hoping to convey that we do have an understanding of what this patient has been going through and offering her a sense of hope," he said.

—Betsy Bates