HOW WILL TOURETTE SYNDROME STRIKE WITHIN A FAMILY NEXT?

by Tracey Arial

Children who move or speak suddenly in inappropriate situations can embarrass themselves. When a child has Gilles de la Tourette Syndrome (GTS), such incidents can occur frequently. These vocal or motor tic episodes wax and wane in severity and diminish in frequency after the age of 19.

To try to find out how GTS runs in families, researchers at Yale University and at the University of Toronto studied 100 families over four generations that had been diagnosed with GTS. *"Over 80% of the patients that we see at the clinic and participate in the studies have first-degree relatives—brother, sister, parent, child—that have the syndrome,"* says Paul Sandor, a Toronto-based clinician who participated in the study.

What was once seen as a rare disease is now recognized more prevalent making this type of research more important. *"When I began to work with these patients about 23 years ago, it was believed that it was a disorder that occurred in one person in a million,"* said Sandor. *"It is now estimated that the prevalence of GTS in the general population is somewhere between 1% and 3%. If you go to a special education class, the prevalence is between 7% and 15%."*

To identify hereditary patterns from generation to generation, researchers screened two large multi-generational families for 13 different markers and 25 variations in gene sequences on chromosome 17. They then expanded the study group to include four large families, and later an additional 96 nuclear families, each with one or two diagnosed children.

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"Tourette syndrome is in need of better treatment," said Cathy Barr, a Canadian researcher from the Toronto Western Hospital Institute involved in the study. The problem is complex, however. *"It now seems probable that half a dozen or more genes are involved,"* says Sandor. *"Being able to identify them early would help put in place interventions that would minimize the impact if, and when, the symptoms were to appear."*

Results indicate that three genes in one region of chromosome 17 might protect individuals from, or make individuals susceptible to GTS. The first two genes determine brain development and function. The third gene produces a protein that directs the manufacture of microtubules, which are crucial for pulling chromosomes apart during cell division and connecting nerve cells.

These results have since been duplicated on a third group of 200 families in Montreal, says Dr. Guy A. Rouleau, a geneticist at the Université de Montréal Institute on Brain research and the leader of a group linked to the Tourette Syndrome Association International Consortium for Genetics. *"It's the first pretty solid indication that one of the genes would predispose an individual in a specific way,"* he said. *"We're going to be doing many more markers in this area… We're also continuing to collect families."*

"Telling parents how GTS runs in families would really help," says Sylvain Chouinard, the Director of the Tourette clinic at Sainte-Justine Hospital in Montreal, which treats more than 200 families in which one or more people have been diagnosed with GTS. The most common question he hears from his patients is: *"how will my disease show up in my children?"*

Ref.: Paschou P, Feng Y, Pakstis AJ, Speed WC, Demille MM, Kidd JR, Jaghori B, Kurlan R, Pauls DL, Sandor P, Barr CL, Kidd KK. Indications of linkage and association of Gilles De La Tourette Syndrome in two independent family samples: 17q25 is a putative susceptibility region. *American Journal of Human Genetics* 2004;75(4):545-560.