Scientists identify genes associated with Tourette syndrome

Heredity is the main cause of Tourette's, but researchers think that infections and stress may also play a role.

Tourette syndrome is a neuropsychiatric disorder.

The nervous system of individuals with this syndrome works differently than in others. This results in constantly recurring tics -- involuntary movements and sounds, such as rapid eye blinking, head movements, throat clearing, coughing, and sniffing.

Researchers have now analysed the inheritance patterns of around 800 families having one or more members affected by Tourette syndrome.

An international team of scientists, including researchers from Uppsala University in Sweden, have discovered a number of genes that increase the risk of developing Tourette's. The results are published in the journal, Cell Reports [5].

Mutations in some individuals

In all of the affected families they studied, researchers found genetic mutations not apparent in otherwise healthy families. These mutations sometimes included several genes.

Most Tourette's patients have a mother or father with similar symptoms, according to the scientists behind the research.

But in ten per cent of the families where only one member of the family has the syndrome, they found a new mutation in the inheritance pattern. This really is a new variant that neither of the parents have, according to an Uppsala University press release [6].

Environment can also play a role

Heredity has long been known to be the main cause of Tourette's syndrome. This has been shown in earlier family and twin studies. But the inheritance pattern is complex and does not explain everything. The researchers believe that environmental factors such as infections and psychosocial stress may also play important roles.

Boys are at greater risk of developing Tourette's than girls. The syndrome usually appears at around age seven, but can also occur earlier or later in life.

One hypothesis as to the cause of Tourette syndrome is that some nerve cells do not sequence properly as the brain develops and matures.
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Usually crops up around age seven

The number of tics often peaks between the ages of 13 and 14.

Psychologist Kjell Tore Hovik has studied children with Tourette's for two years. He found that anxiety and depression can create bigger problems than the actual syndrome, according to the Norwegian Psychological Association's website [8].

Anxiety and depression can strongly affect children in combination with Tourette's. They may appear to be more insecure and locked into their decision-making patterns than healthy children, or children with ADHD, or autism.

But parents tend to be not so good at picking up on children's anxiety and depression, making it that much more important for psychologists to recognise these symptoms, says Hovik.

"It's absolutely crucial for the child's development and future that symptoms are caught and treated early," he says in a Norwegian Sykepleien article [9].

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Most improve after puberty

After puberty, most people with Tourette's experience milder and less frequent tics than before.

Heike Eichele at the University of Bergen has also studied children with Tourette syndrome. In an article for the Journal of the Norwegian Medical Association, she says the reduced symptoms coincide with the maturing of the brain's frontal lobe.

This allows affected individuals to better control their behaviour patterns. Children probably also learn to suppress their tics as their brain matures.

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Read more in the Norwegian version of this article at forskning.no[11]

Researchers have found almost 500 genes that increase the risk of developing Tourette syndrome. It is possible that some nerve cells do not properly sequence as the brain develops and matures. (Photo: Shutterstock / NTB scanpix) [12]

Researchers have found almost 500 genes that increase the risk of developing Tourette syndrome. It is possible that some nerve cells do not properly sequence as the brain develops and matures. (Photo: Shutterstock / NTB scanpix) [13]

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Sheng Wang et al.: De Novo Sequence and Copy Number Variants Are Strongly Associated with Tourette Disorder and Implicate Cell Polarity in Pathogenesis, September 2018, [5]
Ingrid P. Nuse based on an article by Siw Ellen Jakobsen

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