Source: *The Straits Times,* pA8
Date: 18 January 2017

Singapore team identifies gene that could play role in autism

Janice Tai

Singapore researchers have pinpointed a gene that could play a key role in causing autism.

The Duke-NUS team found that changes in the gene, CDH13, cause the brain's circuitry and how its cells communicate with each other to work differently than usual.

People with autism have been found to have mutations of this gene.

The team's work, the first of its kind in the world on this particular gene, furthers the global consensus for a large genetic basis for the common developmental condition.

Knowing the genes behind the condition and how they work will play a significant role in detecting autism earlier and developing drugs to treat it.

Autism spectrum disorder (ASD) – an umbrella term that covers disorders such as autism and Asperger syndrome – affects a person's ability to communicate and socialise.

Those with autism often display traits such as poor eye contact or repetitive body movement.

Although the number of diagnoses has surged both in Singapore and globally, science has yet to determine the specific causes and mechanisms behind ASD.

One in 150 children here is on the spectrum, a higher rate than the World Health Organisation's global figure of one in 160 children.

More pre-schoolers here are being diagnosed with developmental issues such as autism, speech and language delays and behavioural problems. There were 4,400 such children in 2014, a 76 per cent jump from the 2,500 in 2010, partly because of greater awareness among parents and teachers in having children assessed.

There is general agreement among experts that genes have a role to play in ASD, as studies show that identical twins have autism more frequently than fraternal twins. Genes are also most likely a big culprit because ASD occurs in early childhood.

"There are about 100 identified genes that may predispose someone to ASD. However, variants in known genes account for a fraction of ASD cases," said Professor Steve Rozen, director of the Duke-NUS Medical School's Centre for Computational Biology. "We have found that CDH13 has a strong effect in causing ASD, and so we can use mouse experiments to test therapies."

He co-led a team of five researchers, who embarked on this project four years ago to identify the genes responsible for causing the different brain defects seen in people with the condition.

In 2013, Prof Rozen worked with his peers from the United States to locate a sequence of more than 700 genes taken from those with ASD. They decided to zoom in on CDH13, which had the most mutations.

The team experimented with modifying the gene in mice and found that brain signals in mice with the mutated gene were transmitted less frequently.

The research may open the way for drugs – for instance, those that enhance brain connectivity – to be developed in future.

There are currently two drugs approved by the US Food and Drug Administration that treat the symptoms of autism, but none for the condition itself. Behavioural therapy can also lessen its symptoms.

The study will be submitted to science journals next month.

Currently, there are no definitive biomarkers to nail down a diagnosis. Instead, those on the spectrum are identified based on reports from parents and clinical observation methods such as standardised questionnaires.

"Children are generally diagnosed with ASD when they are two years old or older here. With genetic breakthroughs, they may be diagnosed earlier and get treated earlier," said Dr Kenneth Lyen, consultant paediatrician at Mount Elizabeth Hospital and founder of Rainbow Centre, a voluntary welfare organisation supporting children with special needs.

jantai@sph.com.sg

App helps identify kids at risk of disorder

There is an app for everything, even to determine whether your toddler is likely to have autism or not.

The app can be used with a child sitting on a parent's lap. Videos will play while a camera captures the accompanying facial expressions and behaviour of the child. Computer vision algorithms then analyse the data collected and advise the user if the child is at risk of autism.

This will help parents decide whether their child needs further clinical assessment.

"This could be a low-cost, scalable screening tool for autism and other neurodevelopmental disorders in early childhood," said Professor Geraldine Dawson, one of the leading researchers on autism in the world. She is the director of the Duke Centre for Autism and Brain Development at Duke University in the United States, and president of the International Society for Autism Research.

She was in Singapore to co-chair a symposium on autism spectrum disorders held at the Duke-NUS Medical School yesterday.

The app is one of the latest projects for Prof Dawson and her team. It is being tested on hundreds of patients in a Duke Primary Care clinic in the US. It has vast potential, Prof Dawson said, because it resolves many of the existing problems surrounding the diagnosis of autism.

Parents may not have the time or money to take their children to a professional for diagnosis. Clinical observation is also often subjective.

In 2012, Time magazine named one of Prof Dawson's projects among the top 10 medical breakthroughs for the year. Her team showed that it was possible to halt some of the brain changes linked to autism and even reverse them.

A working prototype of the app is available only in the US iTunes store for now. Prof Dawson hopes to make Autism & Beyond accessible globally soon.

Janice Tai