New ADHD findings

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A combination of rare and common genetic variations could play a part in biological pathways linked to Attention Deficit Hyperactivity Disorder (ADHD).

Cardiff University scientists revealed last year that children with the condition, like those with autism, were more likely than unaffected individuals to carry duplicated or omitted small DNA segments known as copy number variants (CNVs). The findings suggested that rare genetic variations contribute to ADHD risk. Similar findings have been found for autism, schizophrenia and intellectual disability.

Now a wider study by the same team and colleagues in Eire and Scotland has replicated the initial findings that these large, rare CNVs are more common in children with ADHD than amongst the general population. Their findings additionally suggest a more common type of genetic variant called Single-Nucleotide Polymorphisms (SNPs) may also be relevant to ADHD risk. It has been difficult to identify specific common genetic variants for disorders like ADHD and autism. However the new study found that both rare and common types of genetic variations appeared to impact on the same biological pathways The findings suggest that different types of genetic variations impact on similar pathways that are linked to the disorder.

Attention Deficit Hyperactivity Disorder is characterised by extreme restlessness, fidgetiness, concentration problems and impulsiveness leading to social and educational difficulties. Many affected children also have autistic spectrum disorder, autistic type symptoms, dyslexia, developmental problems, motor-coordination difficulties and behavioural difficulties. For the study published last year, the Cardiff team analysed data from 366 children with ADHD. For the new research, they studied twice as many - 727 - and still found the rare CNVs were more common than in children without the condition.

The team also examined more common SNP variants and found there was no significant difference between children with or without ADHD. However, 13 biological pathways which linked to CNV variants also linked to the SNP variants. The identified pathways affect the development of the central nervous system and four were related to cholesterol, an important component of the brain.

Professor Anita Thapar, Professor of Child and Adolescent Psychiatry at Cardiff University's School of Medicine, who led the study, said: "These results replicate our finding last year that large, rare copy number variants are significantly more common in children with ADHD than those unaffected. However, we also show that other genetic variants need to be examined and SNPs cannot be ruled out of playing a part. We have also identified 13 biological pathways for further investigation ADHD is a complex disorder like all neuropsychiatric problems which means multiple types of genetic and non-genetic risk factors will be involved".

The full paper *Investigating the Contribution of Common Genetic Variants to the Risk and Pathogenesis of ADHD* has just been published in the *American Journal of Psychiatry*.

Provided by Cardiff University

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