HERC1 mutations lead to syndromic intellectual disability in Indian siblings

Scientist at Centre for DNA Fingerprinting and Diagnostics (CDFD) has discovered a new gene associated with a novel syndrome in two siblings (brother and sister) born of consanguineous parents of southern Indian origin.

They were evaluated for brain related disorder i.e., intellectual disability with other developmental abnormalities. A mutation was identified in *HERC1* gene as the likely cause of the disease, using one of the cutting edge next generation technology, exome sequencing followed by DNA microarray analysis. Conventional sequencing confirmed the presence of this mutation in both siblings. Both unaffected parents were found to be carriers for the same mutation. Further functional analysis with the RNA from the affected individuals indicated a possible deleterious effect of the mutation on the protein by changing the structure and function of *HERC1* mRNA that may lead to decreased production as well as loss of important functional domains of the protein.

Identification of disease causing genes for genetic disorders has important value in prenatal diagnosis and genetic counselling of affected individuals and their families. Once gene is identified, families have the option to look for the presence of the disease causing mutation (deleterious change in the DNA) in the second child through genetic testing before the birth of the child and plan accordingly. It also has immense importance in basic research towards understanding gene functions and mechanisms of disease that may help in development of new therapeutic options. Advances in human genetic research and simultaneous development of new high throughput diagnostic tools like next generation sequencing (NGS) has made it possible to quickly and cost effectively identify genes responsible for a particular disease by studying just few affected individuals.

Further research is needed to ascertain the disordered physiological processes (pathophysiological) role of *HERC1* in brain development and disease. The discovery of a new intellectual disability syndrome will be helpful in future genetic testing of patients with similar abnormality and has also advanced scientific knowledge regarding brain development. This discovery was published in a reputed international journal, American Journal of Medical Genetics Part A, in 2016.

Link: https://pubmed.ncbi.nlm.nih.gov/27108999/

Reference:

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