New juvenile myoclinic epilepsy research from American Epilepsy Society's Annual Meeting

December 6 2015

Researchers from Cardiff University, the University of Liverpool and Swansea University presented a new study revealing that people with drug-resistant juvenile myoclonic epilepsy (JME) have a 10 percent chance of having a common copy number variation (CNV). These findings, presented at the American Epilepsy Society's (AES) 69th Annual Meeting, are important for accurate genetic counselling in the early detection and treatment of JME.

Microchromosomal imbalances are increasingly recognized in neurological disorders with a complex genetic inheritance, such as epilepsy, schizophrenia, intellectual disability and autism. They can be both inherited and de novo. Certain genomic areas, or hotspots, appear to be susceptible to CNV. Eighty JME cases were recruited through clinics, and drug resistance was defined as continued seizures despite treatment with adequate doses of appropriate antiepileptic drugs. The cases were submitted for high-resolution genotyping of single nucleotide polymorphisms (SNP).

After analyzing the data, researchers were able to predict 13 hotspot CNVs were predicted at 15q11.2, 15q13.3, 16p11.2, 16p13.11 and 17p11.2. In addition, eight CNVs were confirmed using qualitative polymerase chain reaction. There were also two cases with 1q31.1 deletions. A further 14 confirmed CNVs (in 11 patients) were identified disrupting genes associated with epilepsy, autism, intellectual disability

or schizophrenia. This included three NRXN1 deletions and three NLGN1 duplications.

This study demonstrates that drug resistance enriches a clinical cohort for common CNV to the same extent that intellectual disability does. Furthermore, a common CNV is a marker of a more difficult to treat epilepsy which would be present at diagnosis. The enigma of how these and other genomic variations may contribute to disease may be aided by mapping smaller, recurrent CNVs, such as NRXN1 and NLGN1, and demands further molecular biology studies.

Provided by American Epilepsy Society