The Genetics of Human Epilepsies

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Abstract

***Introduction**: Genetic causes contribute to many different forms of human epilepsies. Genetic analyses obviously represent a very powerful tool to study this highly heterogeneous pathology. The identification of the genes involved in various epileptic syndromes could prove useful in elucidating the basic mechanisms of epilepsies. This review summarise the recent progress that have been made in the localisation and/or identification of many epilepsy genes. **Methods**: The MEDLINE database as well as different other scientific sources were screened. **Results**: While the genes responsible for several progressive epilepsies have now been identified, it is unlikely that they play a role in the aetiology of true idiopathic epilepsies. Although the majority of idiopathic epilepsies are inherited as complex traits, most studies performed to date have led to the identification of several genetic loci underlying rare epileptic syndromes inherited in a Mendelian pattern. Four genes encoding neurotransmitter- or voltage-gated ion channel subunits have been identified in various idiopathic epilepsies. The epilepsies could thus be considered as one of many paroxysmal disorders that are due to mutations in ion channel genes. **Conclusion**: Effort is still needed to identify the genes responsible for the large variety of other epileptic disorders inherited as Mendelian traits and evaluate the role of these genes in the more common and polygenic forms. Defining the genetic bases of the latter will also require that exhaustive association and sib-pair studies to be performed. These studies may help understand the pathophysiology of human epilepsies, will lead to better genetic counselling in affected families, and represent the first step towards the discovery of new therapeutic targets and methods.*

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