Is Addiction to Alcohol Inherited?

Abstract:

INTRODUCTION

Alcohol is steadily increased in developed and developing nations. Both genetic and environmental factors interplay in the aetiology and relapse of alcohol addiction. Alcohol addiction has always co-morbid with other psychiatric disorders that commonly share the reward mechanism. Addiction

The first invention of genetic cause for psychiatric disorders goes to alcohol addiction. In 18th century, The variants of alcohol metabolizing enzymes have been identified and were believed to be moderating the risk of Alcohol addiction. However the advancing genetic methods has moved beyond the genes related to alcohol metabolizing enzymes to genes associated with GABA receptors, identified by Genome Wide Association Study in 20th century. But the overall progress has been very slow when compared to the genetic discovery in other psychiatric disorders. Since, Alcohol addiction is highly co-morbid with other psychiatric disorders as represented by the Dual diagnosis in Alcohol Addiction; a single genotype is lacking paving the way for pleiotropic character of the genes associated with Alcohol Addiction. Future research should focus on the pleiotropic molecular mechanisms of Alcohol Addiction.

Past twenty years have been a wandering experience in the wilderness and now getting a feelings of crossing the River Jordan in the discovery of Genetics of Alcohol Addiction. The Promised Land flowing with milk and Honey is far away in scientific Discovery of Alcohol Addiction. Substance abuse including Addiction to Alcohol is highly Co-Morbid. Alcohol Addiction has an underlying genetic link with many disorders sharing the reward mechanisms.37 percent of Alcohol Addiction has a Co-morbid Psychiatric disorders. The Aldehyde Dehydrogenase CALDH*2) variant was discovered in 1980s,found to be associated with decreased risk of Alcohol dependence.37 Aldh*2 results from Substitution of Lysine for Glutamate at position 504 resulting in nearly inactive ALDH2 enzymes metabolizing Alcohol. This allele is common in East Asian Population,but nonexistent in Europeans and Africans (Oota, H. et al 2004).

ALDH2 Allele has strong Protective effect on Alcoholism. The Odd ratio of Alcohol Dependence for Subjects with ALDH2*2 allele is 0.33 and No documented cases of Alcohol dependence who are homozygous for ALDH2*2 (Kendler, K. S. 1997; & Thase, M. E. 2007).

Keywords:
The Alcohol Dehydrogenase1B*2 (ADH1B*2) allele in ADH1B gene that encodes the B2 Sub-unit of ADH and results in histidine instead of Arginine at position 48 (Edenberg, H. J. 2007). ADH1B*2 is associated with more rapid alcohol oxidation to Acetaldehyde and is Protective against alcohol dependence with an odd ratio of 0.12 in a Chinese population. This variant common in Asian population and weak in Europeans.

The latest methods in genetic research involves Genome Wide Association Studies (GWAS). The first GWAS for alcohol dependence was published by Treutlein and Colleagues in 2009 (Treutlein J. et al., 2009). Latest findings of ADH and ALDH genes associated with Alcohol Dependence were not significant.

Now, it is found that GABA receptor genes have been associated with alcohol dependence. This includes GABRG1, GABRA2, GABRA4 and GABRB1 (Edenberg, H. J. et al., 2004). Alcohol was the first behavioural disorder which validated the genetics contributed to psychiatry. But, only meagre portion of genetic variants have been explored in Alcohol Addiction (Sarah, M.H., & Laura, J.B. 2010).

**CONCLUSION**

Genetic research in Psychiatry has advanced but in Alcohol addiction it is in slow phase though Throughput technology has been put onto play at present. The combination of the heritability of substance dependence, the heritability of psychiatric illnesses and the co-morbidity of substance dependence with psychiatric illnesses indicates that specific genes may be pleiotrophic. Future genetic studies should focus more on Addiction and related psychiatric co-morbidity.

**REFERENCES**