

7th International Conference on

ADDICTIVE DISORDERS AND ALCOHOLISM

July 03-04, 2017 Kuala Lumpur, Malaysia

Study on the genetic basis of alcohol dependence

Tripti Grover, Ranjan Gupta, Atul Ambekar, Renu Singh, Raka Jain and Arundhati Sharma
All India Institute of Medical Sciences, India

Statement of the Problem: Alcohol Dependence (AD) is a chronic relapsing disorder with detrimental health outcomes. Substantial evidence suggests both genetic and environmental factors to be involved in its etiology. While environmental factors are known to play significant roles in developing addiction, genetics makes some individuals more susceptible. This study reports on the screening to identify polymorphisms in genes of the dopamine and GABA pathways in AD patients.

Methodology & Orientation: The study group comprised 100 each of male AD patients, recruited from the National Drug Dependence Treatment Center, AIIMS and individuals who did not consume alcohol (controls). The AD subjects (diagnosis on DSM IVR) and controls were interviewed using a pre-designed questionnaire and WHO ASSIST and 5 ml peripheral blood drawn for genetic analysis after informed consent. Genomic DNA isolated was screened for DRD1 rs686, DRD2 rs6275, ANKK1 rs877138 of the Dopamine pathway and GABRA6 rs13172914 and GABRG2 rs211014 of the GABA pathway by PCR-RFLP. Association with clinical parameters such as age, age at first use, alcohol intake (g/day), ASSIST score, and LFT (SGOT, SGPT) was analyzed using SPSS 20.0.

Findings: Genotype frequencies in the DRD1 rs686 revealed the genotype TT to be significantly higher in patients (78.9%) in comparison to the controls (59.4%) ($p=0.004$). The other two polymorphisms DRD2 rs6275 (cases 16.3%; controls 18.9%; $p=0.63$) and ANKK1 rs877138 (cases 20%; controls 18%; $p=0.40$) did not show association with AD. GABA pathway polymorphisms GABRA6 rs13172914 (cases 17%; controls 16%; $p=0.39$) and GABRG2 rs211014 showed similar frequency (8%) in both groups ($p=0.91$). Correlation with clinical parameters showed the WHO ASSIST score to be significantly associated with DRD2 rs6275 ($p=0.007$) and GABRA6 rs13172914 ($p=0.05$).

Conclusion & Significance: The present findings are suggestive of the role of TT genotype of DRD1 rs686 in conferring susceptibility to alcohol dependence in the Indian male patients.

Biography

Tripti Grover has been a Life Science Researcher with interests in varied fields, including Instrumentation, Bioinformatics and Molecular biology. With her exposure varying from Plant Molecular Biology to Genetics, she has been specializing in Human Genetics from the All India Institute of Medical Sciences (AIIMS), India. With special focus on Alcohol/Opioid addictions, she has been exploring this complex disorder in strengthening the associations among genes. Addiction being a complex disorder has its roots originating both from environment as well as genes. While the environment may vary from child abuse to peer pressure in adolescence, its development and thereafter progression is likely to develop due to Single Nucleotide Polymorphisms (SNPs) in the genes.

tripti.grover@gmail.com

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