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A study on the association of monoamine pathway gene polymorphisms with Alcohol

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Alcohol dependence (AD) a neuropsychiatric disorder involves complex interaction of genes and the environment leading to a negative impact on personal, social and economic status of life. Genes of the monoamine (dopamine and serotonin) pathways regulate the release of various neurotransmitters in the brain and studies report on an association of single nucleotide polymorphisms (SNPs) in these genes with AD. The purpose of the study was to identify presence of SNPs in the monoamine pathway genes in AD subjects.

Methodology: A total of 110 alcohol dependent males from the Department of Psychiatry (based on DSM-IVR criteria) and 100 healthy males from the general population (controls) formed the study group. Subjects were interviewed using the semi-structured questionnaire and WHO ASSIST and 5 ml peripheral blood was drawn after taking informed consent. Six SNPs of dopamine pathway DRD4 120bp duplication, DRD3 Ser9Gly, DRD2 Taq1α, COMT V158M, COMT-287A>G, DRD4 -521C/T and two of pathway HT1B G861C and HTR3B Tyr129Ser were analyzed by PCR/RFLP. Genotype frequencies were assessed using chi-square test and association with clinical parameters by SPSS v20.0.

Findings: Of all the studied SNPs – COMT Val158Met and HTR3B Tyr129Ser showed significant association with AD (p=0.03). Other SNPs studied DRD4 120bp duplication (p=0.17), DRD3 Ser9gly (p=0.185), DRD2 Taq1a (p=0.27), COMT-287 A>G (p=0.12), DRD4 -521C/T (p=0.48) did not show any association. Correlation of clinical features of the AD subjects showed an association of HTR1B G861C with quantity of alcohol consumed per day (p=0.05) and COMT -287A/G with liver function (SGPT p=0.04).

Conclusion and Significance: The present study is indicative of the role of COMT Val158Met and HTR3B Tyr129Ser with AD and suggests that SNPs of the monoamine pathway genes may influence alcohol related behavior in dependent individuals.

Biography

I am Renu Singh PhD student in Department Of Anatomy, All India Institute of Medical Sciences having knowledge in molecular biology techniques such as DNA isolation, polymerase chain reaction, gel electrophoresis, restriction digestion and various other techniques. Besides that I have experience of microbiology and culture techniques.

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