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Abstract Topic: - Complex traits and polygenic disorders

Abstract Title: - A cross sectional study to explore the association of MTHFR gene polymorphisms with the cognitive ability of young adults pursuing a Para medical degree.

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Aims: - The aim of this study was to determine the role of A1298C and C677T polymorphisms of MTHFR gene in young adults and their role in cognitive ability of the said students. Methylenetetrahydrofolate reductase is coded by the gene on chromosome one, location p36.3 in humans. It plays a pivotal role in folate and homocysteine metabolism. The homocysteine levels are managed by this gene which is important for brain function. Every human being has two MTHFR allele, one inherited from each parent. The most common MTHFR polymorphism is called MTHFR C677T mutation. Polymorphism of this gene has already been investigated and are still being investigated. Primarily investigated polymorphisms include C677T (rs1801133) and A1298 C (rs1801131) (SNP). Cognitive ability /function / skills are brain skills that is required by normal human being for reasoning, acquiring knowledge etc. Some previous studies have established the cognitive deterioration with aging and increased levels of homocysteine. Our observation through this literature implicates that polymorphism in the MTHFR gene plays a role in cognitive skills of young adults exposed to similar situation.

Methods: - The study was approved by the institutional review board of SAHS, SBMCH, Chennai. The blood samples of 50 students, 25 males and 25 females, who are undergraduates pursuing para medical sciences and are almost exposed to similar backgrounds were obtained after obtaining informed consent. Genomic DNA was isolated using standard phenol chloroform method. The MTHFR A1298C and C677T polymorphisms were genotyped by PCR-RFLP. The student's cognitive abilities were measured with the help of the Penn Computerized Neurocognitive Battery (CNB) after obtaining due permissions. Student's academic information and demographics was collected using a proforma.

Results: - Study subjects were recruited successfully and blood samples were collected. Genomic DNA was isolated and stored. Student information and the Penn Computerized Neurocognitive Battery test results were obtained and analyzed. PCR RFLP was standardized and genotyping is in process.

Conclusions: - The results from the Penn State battery test revealed that the cognitive abilities and academic performance varied significantly. The analysis of association of the SNPs with cognitive abilities is underway.

Keywords: - Study subjects were recruited successfully and blood samples were collected. Genomic DNA was isolated and stored. Student information and the Penn Computerized Neurocognitive Battery test results were obtained and analyzed. PCR RFLP was standardized and genotyping is in process.