Association of monoamine oxidase B and catechol-O-methyltransferase polymorphisms with sporadic Parkinson’s disease in an Iranian population

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Abstract

Genetic polymorphisms have been shown to be involved in dopaminergic neurotransmission. This may influence susceptibility to Parkinson’s disease (PD). We performed a case-control study of the association between PD susceptibility and a genetic polymorphism of MAOB and COMT, both separately and in combination, in Iranians. The study enrolled 103 Iranian patients with PD and 70 healthy individuals. Polymerase chain reaction restriction fragment length polymorphism (PCR-RFLP) methods were used for genotyping. Our data indicated that the MAOB genotype frequencies in PD patients did not differ significantly from the control group. However, the frequency of MAOB GG genotype was significantly lower in female patients. It has been shown that the distribution of MAOB allele A was slightly higher in PD patients. No statistically significant differences were found in the COMT allele and genotype distribution in PD patients in comparison to the controls. The combined haplotype of the MAOB A, A/A and COMT LL genotype showed a slight increase in the risk of PD in female patients in this Iranian population. The data may suggest that the MAOB and COMT genetic polymorphisms do not play any role in the pathogenesis of PD in Iranians. In addition, the combined haplotype of MAOB and COMT genes did not significantly affect the susceptibility to PD. Future studies involving larger control and case populations will undoubtedly lead to a more thorough understanding of the role of the polymorphisms involved in the dopamine pathway in PD.

Key words: COMT, Iranian, MAOB, Parkinson’s disease, polymorphism.

Introduction

Many investigations have been made to elucidate pathogenesis of Parkinson’s disease (PD), but no unambiguous factors for its occurrence have been indicated [31]. Currently, a conception of ‘double hit hypothesis’ has been presented to describe involvement of genetic factors in occurrence of the disease when subjects are exposed to certain environmental neurotoxins. Dopamine is one of the major modulatory neurotransmitters in the central nervous system (CNS) [20]. As a dysfunction of dopaminergic neurotransmission in the CNS has been implicated in development of PD [17], it has been suggested that genetic polymorphisms involved in the biosynthesis and degra-