CYP2D6 gene amplification and the risk of acute myeloblastic leukemia

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Abstract:
The aim of this work was to evaluate whether patients with acute myeloblastic leukemia (AML) differ from healthy persons in their CYP2D6 genotype. The study was carried out in 34 patients with de novo acute myeloblastic leukemia before chemotherapy and 64 healthy persons as a control group. Mutation in the CYP2D6*3 and CYP2D6*4 alleles was analyzed by polymerase chain reaction amplification and restriction fragment length polymorphism (PCR-RFLP) techniques. Genotyping for the CYP2D6 gene amplification was performed by polymerase chain reaction (PCR) amplification techniques. The frequency of CYP2D6*1, CYP2D6*3, CYP2D6*4, CYP2D6*1xn, CYP2D6*4xn alleles among 64 genotyped healthy persons was 75.0%, 1.5%, 22.7%, 0.8% and 0.0%, respectively and among 34 genotyped patients with acute myeloblastic leukemia: 69.1%, 1.5%, 10.3%, 17.6% and 1.5%, respectively. Statistically significant differences were detected in the gene amplification (p < 0.0001, $\chi^2 = 14.6$) and CYP2D6*4 allele (p = 0.05, $\chi^2 = 3.74$) frequency between the group of patients with acute myeloblastic leukemia and healthy persons. The odds ratio for ultra rapid metabolizers (UM) was statistically significant, it was about 25-fold greater in the group of patients with acute myeloblastic leukemia then in the group of healthy persons. Our findings indicated an overrepresentation of UM and an underrepresentation of CYP2D6*4 allele among patients with acute myeloblastic leukemia.

Key words:
CYP2D6, amplification, acute myeloblastic leukemia, polymorphism, ultra rapid metabolizers