

Frequency evaluation of some *CDKN2B-AS1* gene polymorphisms in gastric cancer patients

Abstract

Background: Despite significant advances in medical sciences, cancer remains one of the most important diseases of the present century and the second leading cause of death after cardiovascular disease. Gastric cancer is one of the most common human cancers and the sixth most common cancer globally. With approximately 1,089,103 new cases and 768,793 deaths in 2020, GC is reported as the third leading cause of cancer death worldwide. Risk factors for gastric cancer include diet, obesity, alcohol and smoking, *Helicobacter pylori* infection, and genetic factors. Genetic factors mainly refer to genes involved in cancer that play an important role in genetic and epigenetic changes, oncogenes, tumor suppressor genes, cell cycle regulators, DNA repair genes, and signaling molecules. The main components of genetic factors are mutations and polymorphisms that have their effect by changing the expression or function of proteins. The *CDKN2B-AS1* gene is one of the most important genes involved in human cancers, especially gastric cancer, and has a pro-oncogenic role in many cancers. Polymorphisms are the cause of individual differences in susceptibility to disease and response to drug therapy. Therefore, identifying different types of genotypes that predispose individuals to gastric cancer can be very useful in screening, diagnosis and treatment.

Aim: Comparison of the frequency of some *CDKN2B-AS1* gene-dependent polymorphisms in gastric cancer patients and healthy individuals.

Materials and Methods: In this case-control study, 228 patients (118 patients with gastric cancer as case group and 110 healthy individuals as control group) were selected from Aras Clinic of Imam Khomeini Hospital and Digestive Disease Research Center in Ardabil. Whole blood samples were collected from the subjects for DNA extraction and determination of *CDKN2B-AS1* gene

polymorphisms using the Tetra-Primer ARMS-PCR technique. Finally, the results were analyzed by t-test and X^2 .

Results: After data analysis, the frequency of three polymorphisms rs1333049, rs496892 and rs2151280 were significantly different in case and control groups ($p < 0.05$). But, rs2383207 polymorphism in our study did not show significant frequency in both groups ($p > 0.05$). Also, after additional tests, it was found that people with haplotype CCTC are less, and people with haplotypes TTTG, CTTG, TTTC, are more susceptible to gastric cancer.

Conclusion: In this study, it was found that some polymorphisms of the *ANRIL* or *CDKN2B-AS1* gene were associated with an increased risk of gastric cancer and others had a protective effect against this cancer. It can be concluded that each of the rs1333049, rs496892 and rs2151280 polymorphisms can play an important role as biological markers (biomarkers) in the early diagnosis and prognosis of gastric cancer, which requires more and more extensive research.

Keywords: Gastric Cancer, LncRNA, *CDKN2B-AS1*, Oncogene, Single Nucleotide Polymorphism (SNP)