Assessing the Correlation between miR-141 Expression, Common K-Ras Gene Mutations, and Their Impact on Prognosis in Colorectal Cancer Tissue of Iranian Patients

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Abstract : Background: In many human malignant tumors, microRNA expression is aberrant. This study investigates miR-141 as a prognostic marker in colorectal cancer with K-Ras mutation. Materials and methods: In this case-control study, 100 patients, mostly over the age of 50, who were diagnosed with colorectal cancer were selected. The pathology department of the Mostoufi Pathobiology and Genetics Laboratory in Tehran confirmed the presence of colorectal cancer in samples of paraffin-embedded colon tissue. The case group was composed of patients with codon 12 and 13 mutations in exon 2 of the K-Ras gene, while tumor samples of individuals without these mutations in exon 2 of the K-Ras gene were selected as the control group, with patient consent. The changes in the expression of miR-141 were examined in both groups. Results: The study found that 20% of the patients tested positive for codon 12 mutation, and 10% of patients had codon 13 mutation. As a result, in 30 cases, there was a higher level of miR-141 expression. The miR-141 gene expression level in K-Ras positive tumor samples was 1.5 times higher than its expression level in K-Ras negative samples. This increase in expression was statistically significant, with a p-value of less than 0.001, indicating that the observed results are highly statistically significant. Conclusion: The study revealed that the incidence of typical K-Ras gene mutations among the colorectal cancer patients in the sample matches the national average in Iran. Additionally, the expression of miR-141 can serve as a useful biomarker to aid in the prognosis of colorectal cancer.