Investigating the effect of replacing microRNA regulating migration and apoptosis and changing PD-L1 gene expression in gastric cancer cell line (AGS-MKN45)

Abstract

Background: Gastric cancer is one of the main causes of cancer related death, which includes about 50% of all gastrointestinal cancers. Changes in gene expression have been observed in all types of cancers, including stomach, breast, colon, prostate, etc. Many genes effective in cancer development are regulated by microRNAs. Among the types of immune checkpoints, miRNAs have the best therapeutic effect in terms of inhibition of CTLA-4 and PD-1/PDL-1, etc. Studies show that the expression of miR-320a decreases in gastric cancer. The purpose of this study is to investigate the change in expression of miR-320a after replacement in gastric cancer cell line (AGS-MKN45-KATOIII) and its effect on inhibiting the growth and migration of these cells and reducing the expression of PDL-1 gene.

Aim: The aim of this study is to investigate the change in the expression of a320-microRNA after replacement in the gastric cancer cell line (AGS-MKN45) and its effect on inhibiting the growth and migration of these cells and reducing the expression of the PDL-1 gene.

Materials and methods: The gastric cancer (AGS-MKN45-KATOIII) cell line were cultured in an incubator at (37C with moisture 95% and 5% Co2) using RPMI-1640 culture medium with 10% FBS . Using miR-320a electroporation method It was transfected into cancer cells. The RT-PCR test was used to investigate the increase in the expression of the miR-320a gene and also the effect on the change in the expression of target genes in cancer cells. The MTT test was used to investigate the inhibition of the proliferation of cancer cells. The Wound test was used to investigate the migration of cancer cells. healing assay was used. Flow Cytometry test was used to check the amount of apoptosis induced in cancer cells.

Results: The result of the qRT-PCR test showed a significant increase in the miR-320a gene and a decrease in the PD-L1 gene in all three cell lines following the miR-320a transfection compared to the control group. The results of MTT test showed inhibition of growth and proliferation in cancer cells. Wound healing assay test results showed a decrease in cell migration in cancer cells. Flow Cytometry test results showed an increase in apoptosis in cancer cells.

Conclusion: The result showed that increasing at miR-320a expression level has an important role in the reduction of growth and migration at gastric cancer cell line (AGS-MKN45-KATOIII)

Keyword: Gastric cancer - Cell Migration - Transfect – microRNA-320a – Apoptosis