Evaluation of cell-free miR2110 in hepatocellular carcinoma patients' liquid biopsies

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Background & objectives

Circulating extracellular miRNAs participate in numerous regulations of biological processes and are abnormally expressed under abnormal or pathological conditions. Cancer cells release miRNAs into their environment and are associated with cancer initiation and progression. The quantity changes of circulating miRNAs are a potential noninvasive biomarker for cancer detection. In our previous study, miR-2110 secretion from liver cancer cells was detected. In the literature, a higher expression profile of miR-2110 has been found in rectal cancer compared to normal tissues, but mir-2110 expression is decreased in the plasma of prostate cancer patients. Therefore, the role of miR-2110 is not yet fully understood. In addition, there is no information in the literature about the expression profile of miR-2110 in hepatocellular carcinogenesis and its role in cytokine expression. The aim of this study was to compare miR-2110 expressions in HCC patient sera and healthy sera, and also to examine the cytokine profiles of miR-2110-transfected HCC cells.

Methods

Serum was obtained from 15 HCC patients and 9 healthy controls. miRNA was extracted using the miRVana miRNA isolation kit. The expression of miR-2110 from 15 HCC sera was compared with 9 healthy control sera by real-time PCR using the TaqMan qPCR kit. MiR-16-5p primer was used as the housekeeping gene. SNU 398 HCC cell line was transfected with miR-2110 and negative miRNA control was performed with lipofectamine 3000. Transfection efficiency was evaluated with the TaqMan qPCR kit. Inflammation-related genes; IL-6, IL-17C and AKT-1 expressions were examined in mimic-miR2110 and negative control transfected SNU 398 cell line.

Results

miR-2110 expression was decreased in 9 of 10 patients compared to the healthy mean using the comparative Ct method. In addition, a significant positive correlation was found between the miR-2110 expressions and serum AFP values of HCC patients. miR-2110 transfected SNU 398 cells showed a 20-fold increase in miR-2110 expression compared to the negative control miRNA transfected SNU 398 cells. In addition, a decrease in the expression of inflammation-

related genes such as IL-6, IL-17C, and AKT-1 was observed in the miR-2110 transfected SNU 398 cells compared to negative control transfected SNU398 cells.

Conclusion

The decrease in miR-2110 expression in HCC patient sera compared to healthy sera and the miR-2110 transfection caused decreased inflammation-related genes in HCC cells. These results indicate that miR-2110 may have tumor suppressor properties in hepatocellular carcinoma.