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Expression profiling of 84 circulating miRNAs in Egyptian colorectal cancer patients

Noha G Bader El Din, Marwa K Ibrahim, Sally Farouk, Reem El-Shenawy and Ahmed Khairy
National Research Centre, Egypt

Background & Aim: Colorectal Cancer (CRC) is the second most common cancer in women (9.2%), the third in men (10.0%) and the fourth cause of cancer death worldwide. In Egypt, the incidence of colorectal cancer is 5.1% in males and 4.7% in females. Egypt has high rate of early onset CRC in the world as 35% of more than 1,600 Egyptian CRC patients were under 40. The five-year survival rate drops from 75 to 25% for the younger patients. Different clinical studies performed on Chinese, European and American CRC patients showed differential regulation of miRNAs in colorectal cancer. However, comprehensive data on cancer in Egypt is limited and few studies have been conducted to better understand the CRC disease. The current study evaluated the expression profile of 84 miRNAs in the serum of CRC Egyptian patients and related the miRNAs regulation to the pathogenesis and stages of the disease.

Materials & Methods: According to inclusion and exclusion criteria 39 subjects were enrolled (24 CRC patients; 15 healthy controls) and blood samples were collected from all subjects. The miRNAs were extracted from the serum samples and then subjected to miRNA array analysis.

Results: SABioscience software and the statistical analysis showed the up-regulation of miRNAs (7a, 100, 10b, 126, 146a, 150, 192, 21, 223, 224, 23a, let 7c, 10a, 148a, 15a, 26b, 374a, 7-5p, 15b-5p, 191-5p, 26a) and down-regulation of others (106b, 17, 210, 107, 103a). The AUC showed that 5 miRNAs 374a, 223, 26a, 21, let-7c were significantly up-regulated in CRC patients (0.0001, 0.0003, 0.0005, 0.001, 0.008, respectively). We have found that these up-regulated miRNAs could be used as diagnostic biomarkers for CRC. Receiver operating characteristic curve analysis (AUC) disclosed the highest diagnostic potential for miR-374a, miR-223, miR-26a, miR-21, miR-let-7c to discriminate colorectal cancer patients from the control with highly diagnostic potential and also have prognostic potential for discrimination between grades of colorectal.

Conclusion: Aberrant miRNA expressions are highly involved in the cascade of colorectal carcinogenesis and the serum level of miR-374a, 223, 26a, 21, let-7c serve as biomarkers of colorectal cancer in Egyptian patients with high diagnostic power. The expression of these miRNAs can provide new targets for therapeutic intervention of colorectal cancer.

nbadereldin@yahoo.com