MicroRNAs as Novel Potential Biomarker in Gastric Cancer: Diagnostic and Prognostic Biomarkers

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Gastric cancer (GC) has a high incidence and ranks second in the leading causes of cancer-related death. In 2012, it occurred in 950,000 people and led to 723,000 deaths. Despite many advances in the treatment of GC, patients show poor prognosis, and the 5-year survival rate is 5-20%, and >80% of cases are diagnosed at the middle to late disease stage. Therefore, identifying novel biomarkers open new landscapes in diagnosis and prognosis for various stages of GC. Today, the existing cancer biomarkers such as MG7-Ag, CEA, CA199, CA72-4, and CA50 in clinical diagnosis cannot be effectively applied to the clinical diagnosis of GC because of their low sensitivity and specificity (1). A large part of gastric cancers causing genes regulate with microRNAs (miRNAs) that bind to 3′ untranslated region (3′UTR) of mRNAs. Detection of miRNAs, in tissue also in serum/plasma, may enhance the sensitivity and specificity of diagnostic and prognostic tests for early-stage gastric cancer. Some of these miRNAs were significantly up-regulated in GC endothelium compared to normal endothelium such as miR-21, miR-27a, mir-34b, mir-34c, mir-128a, miR-20b, and miR-20a also some of Circulating miRNAs in serum/plasma were up-regulated are miR-20b, miR-20a, miR-17, miR-106a, miR-18a, miR-21 (2,3). In the other hand, other miRNAs such as mir-128b, mir-129, and mir-148 were reported to be down-regulated in GC tissue and miR-375, let-7a, miR-218, and miR-195-5p in serum/plasma of patients with GC. Furthermore, some of the miRNAs are connected with prognosis, for example, miR-127a, miR-126a, miR-204, miR-146a, miR-486-5p, miR-206, and Let-7a are involved in invasion, migration and metastasis, so they are associated with poor prognosis (3). Studies revealed that some panel of miRNAs could distinguish GCs from controls with high sensitivity and specificity. For example, a panel including miR-221, miR-744, and miR-376c have 82.4% sensitivity and 58.8% specificity for GC detection and diagnostic sensitivity and specificity of miR-21 is 78% and 89%, respectively (4,5). Finally, miRNAs have a great potential to serve as new biomarkers in the detection and prediction of prognosis of GC.

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