Fluctuations of epigenetic regulations in human gastric Adenocarcinoma: How does it affect?

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ABSTRACT

Gastric cancer (GC) or human gastric adenocarcinoma is one of the most commonplace type of serious cancers and also the most common cause of cancer-related mortality in the world. Relatively, many studies have acknowledged that GC is a multi-factorial pathological situation that environmental factors, particularly dietary ones and H. pylori infection are considered to have a strong key role in the etiology of GC. Inappropriate dietary habits are the first cause as they affect main molecular functions related with the onset of the GC tumorigenesis and carcinogenesis. Correspondingly, cancer investigation has impressively zoomed on the different genetic markers and also molecular mechanisms pathways responsible for the progression of the GC. Various molecular signaling pathways such as WNT, NOTCH, SHH, MYC have different functions and analyzing their role in the GC is of great importance particularly for the treatment modalities. Proportionately, fluctuations of epigenetic alterations including DNA methylation, histone modification, histone acetylation and also histone phosphorylation’s are involved in all cancers specially the GC. Conspicuously, novel developments in cancer epigenetic have indicated immense reprogramming of every structure of the epigenetic mechanism in cancer, comprising microRNAs, nucleosome positioning, DNA methylation, noncoding RNAs, and histone modifications. In this account, aberrant DNA methylation mechanism in the promoter regions of certain genes, which leads to silencing of some particular genes such as tumor suppressor and other cancer-related genes in carcinogenesis, is the most important epigenetic hallmark in human GC especially as a target for detection and diagnosis in cancer treatment.

Here, we review the importance of epigenetic fluctuations alongside with their molecular signaling mechanism in the GC.

1. Introduction

Gastric cancer (GC) which is divided into 2 classifications (intestinal and diffused) is one of the most common place and serious type with high mortality [1,2]. Strikingly, 5-year retention consequences for the GC extremely have to do with clinical steps ranging between 10–93% in different regions [3]. In this way, primitive GCs are usually diagnosed and remedied by endoscopy or surgery. Progressive GCs are generally remedied by surgery and or chemotherapy with guidance’s special to that country. However, some patients experience the recoil and metastasis during this phase. Tardy diagnosis and diverse exposure of disease together with a general shortage of efficient therapies in order to fight disease heterogeneity are main participants of the high fatality level [4].

GCs are essentially complicated and differing among patients. Importantly, GCs are different in genetic and environmental etiologies, inception age, tumor position, histological appearances and molecular specifications [5,6]. Correspondingly, familiar risk of the GC takes place in 10% of instances, from which 23% have to do with special germinal mutation [7,8]. In diffused GC type, chronic situation by Helicobacter (H) pylori is a predominant driver incident, in which colonization of tumor epithelia culminates in inflammatory precancerous fall composed of chronic gastritis, atrophic gastritis, intestinal metaplasia, dysplasia and eventually adenocarcinoma [9–11]. Risk of malignancy is