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Writing Assignment #3

Online course

In 2015 in China there was about 679,000 new cases of gastric cancer in China, 498,000 deaths, with gastric cancer being the second highest mortality rate. The early detection of gastric cancer is low with some patients just having lymph nodes at first look. Which leads to loss of surgical cure and lowers survival rate. The incidence of gastric cancer in China accounts for 42.6% of the world and the death of gastric cancer in China accounts of 45%. The Purpose of this article is to explain what was found when explored the role of ADMA in gastric cancer. There were 115 gastric cancer patients that were analyzed by ELISA and survival analysis. Experiments were conducted to conducted to detect the signaling pathway induced by ADMA in gastric cancer. Gastric cancer patients with high ADMA levels had poor prognosis and low survival rate. So, high level of ADMA did not affect the proliferation while promoted the migration and invasion of gastric cancer. A healthy adult produces 300 µmol of ADMA per day. ADMA is mainly synthesized by protein arginine methyltransferases. PRMTs us S-adenosylmethionine as a methyl donor to transfer methyl groups to nitrogen atom of guanidinium group of arginine, catalyzing the methylation of arginine residues. It has been reported that ADMA serum levels were high in a variety of patients with tumor, including lung cancer, hematopoietic tumor, breast cancer, gastric cancer, esophageal cancer and colon cancer, but its role in tumor development is still unclear. ADMA plays a huge role in promoting tumor progression in colon cancer and esophageal cancer, but it has not been well investigated for gastric cancer. There is a lot of evidence have suggested that the canonical Wnt/β- catenin pathway plays a critical role in inducing cancer steam cell to undergo EMT and that is a fundamental and conserved process that is critical for embryogenesis and some other pathophysiological processes, particularly tumor genesis and progression. Some materials and methods that were used are going to be talked about next. Six human gastric cancer cell lines were obtained from the Chinese academy of sciences in Shanghai, China. Every line was maintained in RPMI-1640 supplemented with 10% FBS except AGS in DMEM/Hams F12 medium and incubated at an atmosphere containing 5% CO2 at 37 degrees Celsius. Patients were randomly enrolled in between January 2013 and December 2014 at the department of General Surgery of the Second Fafiated Hospital of Fujian Medical University. No patient received chemotherapy or radiotherapy before surgery and all tumors were frozen in liquid nitrogen immediately. Then the serum ADMA levels were measured by using enzyme linked immunosorbent assay method. In this study we examined serum from 115 patients with gastric adenocarcinoma patients and 110 noncancerous cases were used as controls. In conclusion the serum ADMA levels in patients with gastric cancer were significantly higher than normal subjects. Kaplan–Meier survival analysis showed that GC patients with high level of ADMA had observably shorter survival than low level ADMA group. These results indicated that ADMA may function as a tumor activator, and it may promote the development and progression of gastric cancer. Many studies shown that EMT is considered a key event in the initial invasion step of cancer metastasis which allows polarized epithelial cells to become mesenchymal cells. We found that the level of serum ADMA is higher in gastric cancer samples and its high level is closely related to depth of tumor invasion. In this serum ADMA level was elevated in patients with gastric cancer and high concertation of ADMA in gastric cancer cells enhanced cell migration and invasion in vitro via Wnt/β-catenin pathway. With this information we speculated that ADMA functions as a tumor activator in gastric cancer and may benefit clinical practice. According to the clinical data, we found serum ADMA level is positively correlated with depth of tumor invasion and clinical stage. Given these evidence we speculate that the ADMA may be associated with the migration and invasion of the gastric cancer cell. In our present day study, we find that ADMA induced morphological changes of gastric cancer. ADMA treatment caused that gastric cancer lot there epithelial cobblestone like morphology to acquire a more elongated fibroblast like shape. In another summary this is the unprecedented study exploring the effect of ADMA in gastric cancer and demonstrate for the fist time that ADMA is likely act as a tumor activator in gastric cancer.

GC patients with high serum ADMA level is strongly correlated with tumor progression and clinical prognosis. In addition, it is difficult to regulate the level of ADMA in tumor until now, but we offer insights into the therapy of GC.

Citations

1.Guo Q;Xu J;Huang Z;Yao Q;Chen F;Liu H;Zhang Z;Lin J; ADMA mediates gastric cancer cell migration and invasion via Wnt/β-catenin signaling pathway. *Clinical & translational oncology : official publication of the Federation of Spanish Oncology Societies and of the National Cancer Institute of Mexico* Available at: https://pubmed.ncbi.nlm.nih.gov/32607811/. (Accessed: 2nd October 2023)