Vitamin D in Different Stages of Gastric Cancer

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ABSTRACT
The purpose of this study is to investigate the diagnostic value of Vitamin D in different stages of Gastric cancer. Gastric cancer is the fourth most common cancer and the second leading cause of cancer-related deaths following lung carcinoma despite a worldwide decline in both incidence and mortality since the later half of the twentieth century. Effective interventions have been aimed to decrease the total cancer burden in many parts of Asia. Some in vitro studies have also suggested that vitamins may prevent GC through different processes, such as scavenging of nitrite in the stomach, reducing oxidative stress, and inhibiting nitrosation.

Design/Methods: Gastric cancer patients were selected on the basis of stages of cancer. In this study, we demonstrated that serum vitamin D levels very helpful for monitoring different stages of gastric cancer. Results: The levels of Vitamin D were found to be significantly decreased in different stages of gastric cancer when compared with control Conclusions: Vitamin D as a steroid hormone. Its serum concentrations in healthy individuals positively correlate with gastric cancer.

KEYWORDS: Vitamin D, Gastric cancer

Introduction
Gastric cancer (GC) is the second leading cause of cancer-related mortality worldwide, with an estimated 989,600 new cases and accounted for 738,000 deaths in 2011 [1]. Despite the decrease in overall incidence, the total survival rate for GC patients did not improve significantly over the past two decades [2]. The only potentially curative treatment for GC is surgery, but only about 20–40% of patients can undergo radical resection. GC have become the main contributors to the total cancer burden in many parts of Asia [3]. Effective primary prevention strategies for GC, especially vitamin intake, have drawn considerable attention. For example, vitamins have been reported to play an important role in the prevention of GC in many studies [4]. Some in vitro studies have also suggested that vitamins may prevent GC through different processes, such as scavenging of nitrite in the stomach, reducing oxidative stress, and inhibiting nitrosation.

Vitamin D is a secosteroid hormone critical to skeletal health and other biological pathways [5]. Vitamin D3 is the natural form of vitamin D produced in skin through ultraviolet irradiation of 7-dehydrocholesterol. It is biologically inert and must be metabolized to 25-hydroxyvitamin D3 in the liver and then to 1,25-dihydroxyvitamin D3 (VD3) in the kidney before functioning. The only potentially curative treatment for GC is surgery, but only about 20–40% of patients can undergo radical resection. GC have become the main contributors to the total cancer burden in many parts of Asia [3]. Effective primary prevention strategies for GC, especially vitamin intake, have drawn considerable attention. For example, vitamins have been reported to play an important role in the prevention of GC in many studies [4]. Some in vitro studies have also suggested that vitamins may prevent GC through different processes, such as scavenging of nitrite in the stomach, reducing oxidative stress, and inhibiting nitrosation.

A number of studies have been done to prove whether vitamin D has the preventive function to various kinds of cancers. Results were debatable, and consistent associations have only been demonstrated in colorectal cancer [7,8]. The Cohort Consortium Vitamin D Pooling Project of Rarer Cancers have suggested that circulating 25(OH)D concentration was not significantly associated with upper GI cancer risk, but analysis on race subgroup in that study showed that among Asians, lower concentrations of 25(OH)D were associated with a statistically significant decreased risk of upper GI cancer [9]. A prospective study built an index from factors that predicted higher vitamin D status was statistically significantly associated with a lower risk of esophageal cancer and non-statistically-significantly with a lower risk of stomach cancer [10].

Materials and Methods
Chemicals: Vitamin D kits were purchased from immune Diagnostic kits, USA. All the other chemicals used were of analytical grade.

IIb. Experimental Design
Out of 44 patients were divided into six groups. Group I: Normal subjects, Group-II: Stage-0 Gastric cancer, Group-III: Stage-I Gastric cancer, Group-IV: Stage-II Gastric cancer, Group-V: Stage III Gastric cancer and Group-VI: Stage IV Gastric cancer patients. Patients demographic data, including sex, age, and risk factors for cancer events including high-risk age (49-64), smoking history, histopathological record, were recorded.

The study was conducted during the period of December 2015 to August 2016 in department of Biochemistry, Poonayah Ramajayam institute of Medical Science, Kanchipuram District, Tamil Nadu. India.

III. Statistical Analysis
Data were analyzed using the SPSS software package, version 17.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were expressed using range, mean, SD, and median, whereas qualitative data were expressed as frequency and percentage. P value was assumed to be statistically significant at 0.05.

IV. Results
Study Participants
The demographics, histological cell type, and stage of Gastric cancer of the 22 patients including 6,16,2,3 and 7 of cancer patients were Stage 0, stage I, stage II, stage III and stage IV type of gastric cancer respectively. The percentage of gastric cancer stage-0, stage-I, stage-II, stage-III and stage –IV levels in the groups are 18%, 47%, 5.9%, 8.8% and 20.5% respectively.
accompanied by a concurrent increase in phosphatase and demonstrated that VD3 significantly promoted apoptosis in receptor (VDR) elements have been identified in the promoter of PTEN, suggesting that vitamin D may play a role in the differentiation and cell cycle arrest in a number of malignant cells, and may also limit proinflammatory stresses. Functional vitamin D (25(OH)D) concentrations have been associated with increased risk of esophageal squamous cell carcinoma (ESCC) in men, but not gastric cancer or noncardia adenocarcinoma [13]. Case-control studies of upper GI cancer examining dietary and/or supplemental vitamin D have reported that higher vitamin D intake is associated with lower risk of ESCC [14], increased risk of gastric cancer [15], or had no association with gastric cancer. However, three studies which used different methods more available solar radiation in lower latitudes, higher vitamin D intake and higher vitamin D exposure index [16] to estimate vitamin D exposure uniformly showed higher vitamin D levels were associated with lower risk of gastric cancer.

Conclusion:
In the present study results should be confirmed in a prospective study to assess the serum vitamin D levels at time of surgery. If the results are confirmed, our results, combined with findings in other studies, suggest that dietary vitamin D supplementation may be advisable for early stages of gastric cancer patients, particularly during the winter season and in groups that tend to be deficient in vitamin D.

Reference: