

Serum Lipid Profile of Gastric Cancer Patients in Mountainous Valley of Kashmir

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ABSTRACT

Introduction: Worldwide, cancer has become a public health problem and one of the leading causes of death. Gastric cancer develops in stomach and may spread to other parts of the body, particularly the liver, lungs, bones, lining of the abdomen and lymph nodes. Kashmir is a high prevalence zone of stomach cancer. Incidence of gastric cancer in Kashmir has been reported to exceed 40% of all cancers and the incidence is 3 to 6 times higher than that at various metropolis cancer registries in India. Hence, the aim of the present study was to assess the serum lipid levels of the gastric cancer patients in Kashmir.

Material and Methods: This study was conducted in Department of Biochemistry Govt. Medical College, Srinagar on sixty patients diagnosed with gastric carcinoma and admitted in Shri. Maharaja Hari Singh Hospital. Venous blood samples were collected in green top tubes and were transported to the laboratory and the samples were centrifuged at 3000 rpm for 10 minutes and serum was separated for the estimation of Lipid profile. Each sample was processed on the same day of its collection and was analyzed for total cholesterol, triglycerides, HDL-Cholesterol and LDL-Cholesterol.

Results: The mean total cholesterol, triglyceride, HDL-Cholesterol and LDL-Cholesterol levels were found to be 157.14 mg/dl, 136.85 mg/dl, 38.96 mg/dl and 91.52 mg/dl respectively. The level of total cholesterol ranged from 90 to 212 mg/dl while the level of triglyceride ranges between 77 to 291 mg/dl and that of HDL-Cholesterol from 28 to 70mg/dl and LDL-Cholesterol from 35-140 mg/dl.

Conclusion: The serum triglycerides, total cholesterol and LDL-cholesterol levels fall in the normal reference range in gastric cancer patients while the mean HDL-cholesterol level is slightly lower than the normal reference range.

Key words: Gastric cancer, Lipid profile, Hypocholesterolemia

makes up to about 7% of cancer cases and 9% of deaths. In 2012 gastric cancer was found in 950,000 people and caused 723,000 deaths (World Health Organization, 2014).⁵ Before the 1930s in most of the world, including the United States and the United Kingdom, it was the most common cause of deaths from cancer.⁶ Rate of deaths have been decreasing in many areas of the world since then which is believed to be due to the eating of less salted and pickled foods as a result of the development of refrigeration as a method of keeping foods fresh.⁷

Helicobacter pylori infection is an essential risk factor in 65–80% of gastric cancers. The mechanism by which *H. pylori* induces stomach cancer potentially involves chronic inflammation, or the action of *H. pylori* virulence factors such as CagA.⁸⁻¹⁰ Smoking increases the risk of developing gastric cancer significantly, from 40% increased risk for current smokers to 82% increased risk for heavy smokers. Gastric cancers due to smoking mostly occur in the upper part of the stomach near the esophagus.^{1,11,12} Some of the studies show increased risk with alcohol consumption as well.¹³ Dietary factors are not proven causes but some foods including smoked foods, salt and salt-rich foods, red meat, processed meat, pickled vegetables are associated with a higher risk of stomach cancer.¹⁴ Nitrates and nitrites in cured meats can be converted by certain bacteria, including *H. pylori*, into compounds that have been found to cause stomach cancer in animals. On the other hand, fresh fruit and vegetable intake, citrus fruit intake, and antioxidant intake are associated with a lower risk of stomach cancer. A Mediterranean diet is also associated with lower rates of

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How to cite this article: Suhail Ahmad, Roohi Ashraf, Sabhiya Majid, Javaid Ahmad Bhat, Aatif Hassan Sanaie, Akbar Masood, Nissar Ahmad Naikoo. Serum lipid profile of gastric cancer patients in mountainous valley of Kashmir. International Journal of Contemporary Medical Research 2019;6(5):E1-E4.

DOI: <http://dx.doi.org/10.21276/ijcmr.2019.6.5.5>

INTRODUCTION

Cancer is the most prevalent and leading cause of deaths in the world. Among all cancers, gastric cancer (GC) is the fourth leading cancer worldwide. It is the second major contributor to mortality caused by cancer globally and is a biologically heterogeneous disease. The early symptoms may include heart burn, upper abdominal pain, nausea and loss of appetite while the later symptoms may include weight loss, vomiting, difficulty in swallowing and the presence of blood in the stool among others. It may spread from the stomach to other parts of the body particularly the liver, lungs, bones, lining of the abdomen and lymph nodes.¹⁻⁴ Globally gastric cancer

S. No.	Test parameter	Observed mean value (mg/dl)	Range (mg/dl)	Normal Reference range (mg/dl)
01	Total Cholesterol)	157.14	90-212	50-200
02	Triglyceride	136.85	77-291	0-170
03	HDL-Cholesterol	38.96	29-70	40-60
04	LDL cholesterol	91.52	35-140	1-129

Table-1: Serum Lipid Levels of Gastric Cancer Patients.

stomach cancer as is regular aspirin use.⁸ Obesity increases the risk of gastric adenocarcinoma by contributing to the development of gastroesophageal reflux disease.¹⁵ Due to this, the obese people have been found to have two times the risk of gastric cardia adenocarcinoma than someone with a healthy weight. Obesity is also seen to increase mortality of this cancer in men.¹⁶ The association of nutritional factors and life-style of the individuals with the incidence of gastric cancer has been reported in many studies¹⁰ and similar risk factors influence lipid profile and the genesis of gastric carcinoma, it may be because lipids are major cell membrane components essential for various biological functions, including cell growth and division of normal and malignant tissues. In the present study, an attempt was made to analyze the serum lipid profile levels of the gastric cancer patients in the mountainous valley of Kashmir.

Kashmir is a high prevalence zone of stomach cancer. Incidence of gastric cancer in Kashmir has been reported to exceed 40% of all cancers and the incidence is 3 to 6 times higher than that at various metropolis cancer registries in India.⁴ Recent reports have focused on possible role of dietary and endogenous lipids in the etiology and prognosis of cancer. A number of epidemiological studies have been published in recent years showing an increased risk of death from cancer subjects with low plasma cholesterol levels.¹⁷ Though several authors proposed that hypocholesteremia is a predisposing factor for cancer development.^{18,19} No causative relation has been established so far. However, some authors believe that hypocholesteremia is in fact the result rather than the cause of cancer.^{20,21} Current theories regarding cancer causation have generated interest in variables such as levels of serum cholesterol, triglycerides, LDL-cholesterol HDL-cholesterol and others. Very few studies exist concerning serum lipid profile in patients with cancer.^{22,23} Hence, the aim of the present study was to assess the serum lipid levels of the gastric cancer patients in Kashmir.

MATERIAL AND METHODS

This study was conducted in Department of Biochemistry Govt. Medical College, Srinagar. A total of sixty patients diagnosed with gastric carcinoma and admitted in Shri. Maharaja Hari Singh Hospital, an associated hospital of Government Medical College Srinagar were considered for the study. Venous blood samples were collected in green top tubes and were transported to the laboratory and the samples were centrifuged at 3000 rpm for 10 minutes and serum was separated for the estimation of Lipid profile. Each sample was processed on the same day of its collection and was analyzed for total cholesterol, triglycerides, HDL-Cholesterol and LDL-Cholesterol. All the parameters were

analyzed on a fully automatic Biochemistry analyzer Abbott C4000 with model No.15002002288 kept in analyzer room of Block F Biochemistry diagnostic laboratory SMHS hospital Srinagar.

RESULT

The observed lipid profile levels in gastric cancer patients in the present study are given in the table 1 below:

In the present study, the serum lipid profile of gastric cancer patients was estimated; the mean of total cholesterol, triglyceride, HDL-Cholesterol and LDL-Cholesterol levels were found to be 157.14 mg/dl, 136.85 mg/dl, 38.96 mg/dl and 91.52 mg/dl respectively. The level of total cholesterol ranged from 90 to 212 mg/dl while the level of triglyceride ranges between 77 to 291 mg/dl and that of HDL-Cholesterol from 28 to 70mg/dl and LDL-Cholesterol from 35-140 mg/dl. The observed mean value of total cholesterol, triglyceride and LDL-cholesterol falls within the normal reference range while the observed mean HDL-Cholesterol level was found to be slightly lower than the normal range.

DISCUSSION

The level of serum total cholesterol is within the normal reference range and there is slight decrease in HDL-Cholesterol among the gastric cancer patients compared to the normal controls, the same was also reported by Monharan and his colleagues.²⁴ Low levels of HDL have been associated with increased inflammatory activity²⁵, which may contribute to cancer development. A higher incidence of stomach dysplasia has also been reported for lower HDL levels in a Korean case-control study.²⁶ The observed decrease in HDL-Cholesterol among the gastric cancer patients in the present study can be related to their lifestyle as well as food habit. Environmental factors and lifestyle of the individuals have been implicated in the genesis of stomach cancer. Alterations in blood lipids in smokers have been reported by Craig and colleagues.²⁷ Pugalendi and Ramakrishnan²⁸ reported increased total cholesterol with concomitant decrease in HDL-Cholesterol among smokers. Alcohol is also known to cause changes in the concentration of lipoprotein cholesterol²⁹ L. Inaotombi Devi, Lalsanglura Ralte and M. Ayub Ali in one of their studies have reported that the serum triglyceride and total cholesterol levels were higher in gastric cancer patients while the HDL-Cholesterol level was lowered.³⁰ There was no rise in Triglyceride (TG) levels in stomach cancer patients in our results, but it falls within normal range which supports the findings of H. Ulmer *et al* (2009) and W. Borena *et al* (2011).^{31,32} Total cholesterol (TC) level among gastric cancer patients falls within the normal range which is in contrast with the findings of H.

Iso *et al* (2009) and C. M. Kitahara *et al* (2011) as they found in their studies that there was increased level of TC in gastric cancer patients as compared to normal controls.^{33,34}

Differences in diet and ethnicities in

Mountainous Kashmir valley related to stomach cancer risk may explain the above findings.

CONCLUSION

The gastric cancer is closely associated with the environmental factors and life-style of the individuals. As these factors also affect the serum lipid profile, it is likely that plasma lipid profile of these cancer patients is affected. The serum triglycerides, total cholesterol and LDL-cholesterol levels fall in the normal reference range in gastric cancer patients while the mean HDL-Cholesterol level is slightly lower than the normal reference range but more additional and large population based studies are needed to understand the nature of association of gastric cancer with lipid profile.

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Source of Support: Nil; **Conflict of Interest:** None

Submitted: 15-03-2019; **Accepted:** 20-04-2019; **Published:** 10-05-2019