

Determination the Association between ABO Blood Group and Gastric Ulcer

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Abstract: The aims of this study were to determine the association between ABO blood groups and gastric ulcer and evaluate the levels of serum gastrin and plasma leptin in patients at the General Basrah Hospital. Peripheral blood samples of all subjects were collected for ABO blood group, serum gastrin and plasma leptin estimation. There were significant statistical results related to the blood groups to be considered as a risk factor with P-value < 0.05. There was significant increase in serum gastrin in group 2 compared to the control group. On the other hand, there was significant decrease in serum Leptin in group 2 on comparison to the control group. Patients were use NSAID.

Keywords: gastric ulcer, blood group, serum gastrin, plasma leptin.

Introduction

Gastric ulcer is an imbalance of hydrochloric acid secretion and stomach mucosa which defies hydrochloric acid digestion. Gastric ulcer indicates an acute medical problem (1). Ulcer may obvious in duodenum, stomach, oesophagus and the jejunum, it could likewise develop at the margin of Zollinger-Ellison syndrome or in a gastroenterostomy (2). People with Type O blood group possess a higher amount of stomach acid, whereas people with Type A blood group have the lowest amount (3). Hence, people with Type O have to eat a lot of animal protein, while Type A people must eat lesser (4). The people with Type A blood group cannot digest red meat easily but can digest fish or poultry. After the digestion of the food in the stomach, the food moves to the small intestine, where it is digested in an alkaline environment (5). Many blood group-based antigens affect the secretion or activities of the enzymes in the small intestine. The people with Type A blood contain many enzymes for carbohydrate breakdown, compared to other blood types. This complements the fact that they have a low stomach acid, thereby helping their survival on more beans and less meat, compared to the other blood types (6). The colon, or large intestine, absorbs the maximal amount of water. Hence, it requires a lot of fiber for adding bulk to its content. The insoluble fiber in the food acts as a sponge, which soaks the liquid and helps the passage of the food through the digestive tract. On the other hand, soluble fiber binds to the toxins in the digestive tract, softens the stool and helps their smooth excretion. Along with the classification of fiber as soluble or insoluble, every individual possesses a different fiber composition. Though the body cannot digest fiber, the gut microflora can easily digest it. The gut microflora depends on the blood group of the person (7). Ingestion of a wrong type of fiber can lead to bloating and flatulence. Some studies indicated that the people with Type O blood were not affected with gastric ulcer (8).

Methods

The study was involved 267 subjects, with age range (20 – 65) years at the General Basrah Hospital and were exposure for endoscopy to detect gastric ulcer. Out of 267 subjects 138 were healthy (Group 1: control group), while 129 with gastric ulcer (Group 2). Blood samples of all subjects were collected. The samples were transferred to 5ml tubes, and kept in EDTA-coated tubes for blood group, serum gastrin and plasma leptin analysis.

Results

There is an association between ABO blood groups and gastric ulcer. Type ‘O’ has a higher tendency towards gastric ulcer disease and type ‘AB’ to less affected. The highest positive result of infection was found in the blood group O (59.3 %) while the lowest result was discovered in the blood group AB (34.8%). There were significant statistical results related to the blood groups to be considered as a risk factor with P-value < 0.05 as shown in (Table 1).

Table1: Blood groups distribution in gastric ulcer patients.

Blood group	Group 1 (control) n (%)	Group 2 n (%)
A	45(56.3)	35(43.8)
O	44(40.7)	64(59.3)
AB	15(65.2)	8(34.8)
B	34(60.7)	22(39.3)

P-value < 0.05

There was significant increase in serum gastrin in group 2 compared to the control group. On the other hand, there was significant decrease in serum Leptin in group 2 on comparison to the control group. as shown in (Table 2).

Table 2: Effect of gastric ulcer on serum Gastrin and plasma leptin.

Variables	Group 1 (control)	Group 2
Gastrin (ng/L)	71.00 ± 1.91	120.11 ± 3.96*
Leptin (ng/L)	6.51 ± 0.93	4.91 ± 0.77

Discussion

The results demonstrate that there is an association between the ‘ABO’ blood groups and gastric ulcer, in which type ‘O’ had a higher tendency towards disease and type ‘AB’ to non-affected. The findings of this study support the epidemiological view of higher susceptibility of blood group ‘O’ to gastric ulcer, and those of ‘AB’ blood group less prone (10). The Blood Type O consists of 2 different types of antibodies (i.e., Type A and B). It was believed that the presence of these specific antibodies in the blood provided a survival advantage since a majority of the commonly-occurring diseases possess different markers (antigens) that stimulate the different blood types. Hence, what was previously considered to a transfusion-related complication was seen to be a defensive advantage in the people with Type O blood group. On the other hand, this innate immunity can also affect the health of the people. The various types of ulcers in comparison to people with different blood groups. People with Type O blood group are prone to specific diseases like thyroid disorders or ulcers. It has been proven that these people were 2-times more likely to be affected by the various types of ulcers in comparison to people with different blood groups (4). Furthermore, the people with Type O blood have another unique characteristic, i.e., they can digest the fats and/or protein-containing meals. This was because 2 of the major components required for the digestion of fats and proteins, i.e., lipoprotein ApoB48

and alkaline phosphatase, are secreted in a much higher concentration into the digestive tract of these people (6). These components help these people to metabolize the cholesterol in the animal products, heal the digestive tract and assimilate calcium more efficiently. However, in these people, simple grain-based carbohydrates are easily converted to fats and triglycerides. A majority of the grains contain some reactive proteins, known as lectins, which can significantly intensify the immune system that can result in increased inflammation or auto-immunity. People with Type O blood group possess a higher amount of stomach acid, whereas people with Type A blood group have the lowest amount. Hence, people with Type O have to eat a lot of animal protein, while Type A people must eat lesser (4). The people with Type A blood group cannot digest red meat easily but can digest fish or poultry. After the digestion of the food in the stomach, the food moves to the small intestine, where it is digested in an alkaline environment. The results showed that, gastric ulcer can increase circulating gastrin levels in the blood. It is unclear whether the hypergastrinemia that occurs in gastric ulcer patients is attributable to hypochlorhydria, suppression of somatostatin, chronic gastritis, gastric atrophy or the direct induction of gastrin gene expression by the ulcer itself (Yun et al., 2014). The decrease in serum leptin maybe due to higher degree of antral atrophy/intestinal metaplasia in ulcer compared with healthy person.

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