Brief Report

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Determination of the Frequency of Different Blood Types in Patients with Stomach Cancer Referring to Shahid Beheshti Hospital during 2006-2011

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ABSTRACT

BACKGROUND AND OBJECTIVE: Stomach cancer tends to progress gradually over the years. Considering the relationship between blood type, peptic ulcers and impaired mucus secretion, we aimed to determine the frequency of ABO and Rh blood types in patients with stomach cancer.

METHODS: This cross-sectional study was performed on 150 patients with stomach cancer, referring to Shahid Beheshti Hospital of Babol for surgical interventions during 2006-2011. Moreover, 150 control patients with no prior history of cancer, referring to the clinics, were included in this study. Data including age and sex were recorded in a checklist. After determining patients' blood type and Rh, age, sex, blood type and Rh were converted into numerical codes, and the two groups were compared.

FINDINGS: The mean age of subjects was 61.25±14.52 years in the study group and 58.37±16.37 years in the control group. The number of male subjects was higher than females in both groups. Among 150 patients with gastric cancer, 36 (24%), 47 (3.31%), 2 (3.1%) and 65 (3.43%) patients had A, B, AB and O blood types, respectively. In the control group, 33 (22%), 36 (24%), 8 (5.3%) and 73 (7.48%) subjects had A, B, AB and O blood types, respectively.

CONCLUSION: The results showed that the frequency of O blood type was higher in patients with stomach cancer, compared to other blood types.

KEY WORDS: Gastric Cancer, Blood Group, Contributing Factors.

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Introduction

Stomach cancer tends to progress gradually over the years. Pre-cancerous changes often occur in the lining of the stomach before the cancer is fully manifested. About 85% of stomach cancers are adenocarcinomas, while gastrointestinal stromal tumors, lymphomas and leiomyosarcomas account for 15% of these cancers (1, 2). According to the reports by World Health Organization, stomach cancer is the fourth most common cancer in the world (3).According to the latest statistics by the Iranian Cancer Research Center, stomach cancer is the most common cancer among men and the third most common cancer among women, following breast and colon cancers. Despite the progress in treatment modalities, the five-year survival rate is still low in stomach cancer (1).

Therefore, in order to prevent the incidence of this cancer, precise identification of the causes is essential.The contributing factors for stomach cancer include male gender, age of more than 40 years, family history of stomach cancer, chronic gastritis (especially accompanied by helicobacter pylori infection), pernicious anemia, alcohol abuse, abdominal surgeries (or removal of part of stomach), diets including excessive amounts of protein, smoked, sour and salty foods and low consumption of fresh fruits and green leafy vegetables (1, 4).

In addition, a relationship was established between ABO blood group and stomach cancer in 1900 (5). In fact, the relationship between gastrointestinal diseases and blood type has been highlighted due to the association between peptic ulcers, impaired mucus secretion and blood type. Various studies have introduced A blood type as a risk factor for stomach cancer, which can increase the risk of this cancer by 16% (6,7). The relationship between blood type and various diseases has been discussed for half a century (8). However, no clear evidence is available regarding the relationship between blood groups and risk of cancer (9,10). So far, contradictory results have been reported about the most common blood type in patients with stomach cancer. Moreover, different blood groups have been introduced as risk factors for stomach cancer. Therefore, the aim of this study was to determine the frequency of ABO and Rh blood groups in patients with stomach cancer.

Methods

After receiving permission from the ethics committee of Babol University of Medical Sciences, this cross-sectional, census-based study was performed on 150 patients with stomach cancer, referring to Shahid Beheshti Hospital of Babol for surgical interventions during 2006-2011. Moreover, 150 cases with no prior history of cancer, referring to the clinics, were included as the control group.

Overall, 175 patients with stomach cancer underwent surgical interventions over five years. Cancer was confirmed via pathology report in the study group. Patients with cancers other that stomach cancer or disease recurrence were excluded from the study (n=25). Finally, 150 patients were included in the control group. Written consent forms were obtained from all patients in the study and control groups. For data collection, a checklist including age, sex, blood type and Rh was used. Moreover, blood samples were obtained from all patients to determine Rh and blood group. For data analysis, Chi-square and t-test were performed, using SPSS version 20. $p<0.05$ was considered statistically significant.

Results

The mean age of participants was 61.33±15.63 years. The youngest and oldest subjects were 23

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and 95 years old, respectively. The mean age of subjects was 61.25±14.52 years in the control group and 58.37±16.37 years in the study group. The majority of subjects in the two groups were within the age range of 61-80 years (table 1). There was no significant difference between the two groups in terms of age. Overall, 206 (68.7%) and 94 cases (31.3%) were male and female, respectively. In both groups, the number of male participants was higher than women. However, no significant correlation was observed between gender and stomach cancer (fig1).

Table 1. Distribution of age in patients with stomach cancer during 2006-11

group / Age (years)	Control N(%)	Study N(%)
20-40	10(6.7)	22(14.7)
41-60	58(38.7)	54(36)
61-80	70(46.7)	59(39.3)
81-100	12(8)	15(10)

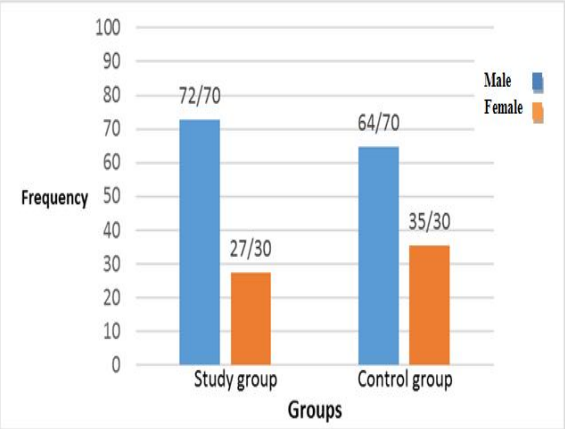


Figure 1. Distribution of gender in the two groups

According to the findings, O blood type had the highest frequency (n=138, 46%). However, there was no significant association between blood type and stomach cancer (table 2). In the present study, 268 subjects (89.3%) had positive Rh and 32 cases (7.10%) had negative Rh. In both groups, positive and negative Rh were reported in 134 (89.3%) and 16 (10.7%) cases, respectively.

Table 2. Frequency of blood types in the control and study groups

Group / Blood type	Control N(%)	Study N(%)
A	36(24)	33(22)
B	47(31.3)	36(24)
AB	2(1.3)	8(5.3)
O	65(43.3)	73(48.7)

Discussion

In this study, O and B blood groups were more frequent than other blood types in patients with stomach cancer, respectively. However, there was no significant association between blood group and stomach cancer. In this regard, in a study by Song et al., risk of stomach cancer was significantly higher in subjects with AA and AO genotypes, compared to those with OO genotype (5). Moreover, Nakao and colleagues stated that the incidence of stomach cancer in patients with B allele was lower than other participants (7). Additionally, Edgren and colleagues found that individuals with A blood type were highly prone to stomach cancer. However, individuals with O blood type had a greater risk of developing peptic ulcers (11). In 1953, Aird and colleagues conducted a study and concluded that blood group is in direct association with stomach cancer. On the other hand, A blood type had the highest frequency, while O blood type had the lowest frequency in patients with stomach cancer, compared to the normal population. Frequency distribution of A and O blood groups was 44.8% and 44.5% in patients with stomach cancer and 39.8% and 48.6% in normal

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individuals, respectively (12, 13). The results of the mentioned study were inconsistent with the findings reported in the current research. This discrepancy may be due to significant differences in the sample size and the examined genotypes in the study described above. Also, in the mentioned study, only the frequency of blood groups was examined. It should be noted that the distribution of blood groups varies in different geographical locations. The limitations of this study were the small sample size and lack of evaluating blood group genotypes. It is suggested that a cohort or case-control study be conducted on a large population to evaluate blood group genotypes in different gastric diseases such as cancer, peptic ulcers and H. pylori infection. The obtained results showed that patients with O blood type were more susceptible to stomach cancer. Also, there was no significant difference in blood groups between patients and healthy individuals.

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