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Frequency of ABO Blood Group in Peptic Ulcer Disease in Iranian Subjects

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Abstract: The relationship between ABO blood group distribution and Peptic Ulcer Disease (PUD) has been widely evaluated in the past. But data concerning the same evaluation are very limited in Iran. This study sought to determine the distribution of ABO blood group in patients with PUD in Iranian subjects. Eighty-one patients with PUD (51 male and 30 female; mean age: 49±18 years) who attended our endoscopy section were enrolled. Blood samples were used for ABO/Rhesus (Rh) blood group antigen typing. The ABO blood group phenotype distribution in subjects was as follows: 37.1% (30/81) for group A, 23.4% (19/81) for group B, 35.6% (28/81) for group O and 4.9% (4/81) for group AB. Rh positivity was found in 63% (51/81) of patients. In local healthy population, ABO/Rh blood group distribution was 33.8, 20.7, 34.7, 8.4 and 89.6% for A, B, O, AB and Rh, respectively. AB blood group distribution in healthy population was higher than PUD (8.4 vs 4.9%). In contrast, Rh positivity of PUD in Iran is lower than healthy subjects (63 vs 89.6%). Variation in the results of studies is related to different study communities. According to these results, probably ABO/Rh blood group has an important role in patients with peptic ulceration. The functional significance of ABO blood group distribution might be associated with biological behavior of PUD. The impact of blood group on PUD may be a focus for further studies.

Key words: Peptic ulcer disease, blood group, ABO, Rh

INTRODUCTION

The ABO blood group system is the most widely investigated erythrocyte antigen system for all populations. Frequency of ABO blood group in most of gastrointestinal disorders has been studied yet. For example, it has been known that individuals with blood group O phenotype have higher risk of developing duodenal ulcers. Similarly, gastric carcinoma was found to be associated with blood group A, but no explanation for this condition was found (Bayan *et al.*, 2009). In addition, the possible relationship between genetic factors and the natural history of peptic ulcer has been the subject of a number of studies (Lethagen *et al.*, 2008; Bayan *et al.*, 2009) and one constitutional factor that has been studied is the ABO blood group system. Although, the weight of evidence is in favor of both hereditary (ABO blood group)

and environmental factors playing a part in the development of bleeding duodenal ulcer (Lethagen *et al.*, 2008; Horwich and Evans, 1966; Langman and Doll, 1965), there are contradictory findings on this subject. In most of the studies, frequency of group O is greater than other blood group. It was suggested that the greater incidence of group O in patients with ulcer disease might be a reflection of the much higher incidence of group O in patients with gastroduodenal bleeding (Bayan *et al.*, 2009). It is possible that some subjects have gastroduodenal mucosa which is especially liable to haemorrhage. These subjects are more frequently of blood group O. There are also studies that point out that blood group O is more common in patients with bleeding duodenal ulcer than those without bleeding (Horwich and Evans, 1966). The relationship between blood type and PUD in human has been suspected and a possible

relationship between ABO blood group antigen and development of PUD has been suggested in many investigations in abroad, but we didn't investigate that in our community.

The aim of the present study was to evaluate the frequency of ABO blood group and Rh phenotype in -or possible relation with- PUD in Iranian subjects.

MATERIALS AND METHODS

Between May 2008 to August 2008, 81 consecutive patients who underwent endoscopy in one endoscopy unit at Urmia University of Medical Sciences, Urmia, Iran; and diagnosed as PUD (51 male and 30 female; mean age, 49±18 years; range: 18-82) were considered for inclusion into our study (Table 1). The study protocol was approved by the ethics committee at the University Research Administration and the patients gave written informed consent to be included in the study. The patients were clinically evaluated and the gastrointestinal signs and symptoms were recorded. Upper gastrointestinal endoscopy was done according to standard medical procedure. Peripheral blood samples were collected from each patient after endoscopy. ABO blood groups and Rh phenotype evaluations were carried out by standard hemagglutination assays. The p-value of less than 0.05 was accepted as statistically significant.

RESULTS

A total of 81 patients were screened. Patients included 30 women (37.0%) and 51 (63.0%) men, aged 18-82 years (mean, 49±18 years), of which 37 (46%) were smokers. Mean age was 53±17 years for women and 47±19 years for men.

Mean age per ABO blood group distribution in patients was as follow: 45±18 years for group O, 54±20 years for group A, 50±16 years for group B and 45±20 years for group AB. The distribution of mean age between blood groups was similar in patients (p>0.05).

The age, gender and smoking habit based on the blood group distribution of these individuals are shown in Table 1.

In present study, the ABO blood group phenotype distribution in subjects was as follow: 37.1% (30/81) for group A, 23.4% (19/81) for group B, 35.6% (28/81) for group O and 4.9% (4/81) for group AB (Table 2).

Rh positivity was found in 63% (51/81) of subjects. The Rh+ distribution among blood groups was as follow: 19/30 (63.3%), 13/19 (68.4%), 16/28 (57.1%) and 3/4 (75%) for blood groups A, B, O and AB, respectively.

Table 1: ABO/Rh blood group distribution based on age and gender and smoking habit

Parameters	Blood groups/Rh					Total (ABO blood groups)	p-value
	A	B	AB	O	Rh+		
Age (years)	54±20	50±16	45±20	45±18	50±18	49±18	>0.05
Gender (Female/male)	14/16	6/14	1/3	9/18	18/33	30/51	>0.05
Smoking (yes/no)	12/18	9/11	3/1	13/14	22/29	37/44	>0.05

Table 2: ABO/Rh blood group distribution in patients

ABO system	Blood groups (n)					Total
	A	B	AB	O	Rh+	
Rh+	19 (23.5)	13 (16.0)	3 (3.7)	16 (19.8)	51 (63.0)	
Rh-	11 (13.6)	6 (7.4)	1 (1.2)	12 (14.8)	30 (37.0)	
Total	30 (37.1)	19 (23.4)	4 (4.9)	28 (35.6)	81 (100)	

values in brackets are percentage

DISCUSSION

ABO blood groups are the most investigated erythrocyte antigen system and owing to the ease of identifying their phenotypes, they have been used as genetic markers in studies of their associations with various diseases (Kanbay *et al.*, 2005). For example, duodenal ulcer is a heterogeneous genetic disorder in which blood group O and ABO non-secretor status has been regarded as a risk factor (Rotter and Rimoin, 1977). Previous studies demonstrated that blood group O is associated with duodenal ulcer disease, while gastric ulcer and gastric carcinoma are associated with blood group A (Clarke, 1959; Mitra, 1971). Romshoo *et al.* (1997) reported that, the majority of peptic ulcer patients (56%) had blood group O and it though a risk factor for peptic ulcer. In another study, Bayan *et al.* (2009) finding contributes to the positive correlation between group O and upper gastrointestinal bleeding caused by gastroduodenal ulcers and erosive gastropathy and the blood group O preponderance in the patients group was seen to be approximately at the expense of group A of the controls. Besides, Rh positivity was also higher in the patient group than in controls (92.9 vs. 87.5%).

To the best of the researchers knowledge, there is not investigation relating to the involvement of ABO blood type in PUD in Iran. As stated earlier, this study designed to determine the distribution of ABO blood group in patients with PUD in Iranian subjects. We showed that ABO blood group distribution in subjects was as follow: 37.1, 23.4, 35.6 and 4.9% for A, B, O and AB group, respectively. Rh positivity was seen in 63% of Iranian subjects. According to data from the local Blood Transfusion Center, in a descending order of blood group frequency: O blood group was detected in 34.7% of population; A blood group in 33.8%; B blood group in 20.7% and AB blood group in 8.4%. Also, Rh

positivity found in 89.6% of healthy population (Pour Fathollah *et al.*, 2004). One interesting result in this study was that AB blood group distribution in PUD is lower than local healthy population. Another interesting result in our study was that Rh positivity of PUD in Iran is lower than healthy subjects (63 vs 89.6%). Although, some investigations have showed correlations between O and A blood group with ulcer peptic, our data showed no correlation. This may be due to the prevalence of *Helicobacter pylori* infection among patients with PUD which needs more investigations. It has been reported that the increased susceptibility of subjects with blood group O to peptic ulcer disease might be due to higher density of colonization by *Helicobacter pylori* and higher inflammatory responses (correlated with release of interleukin-6 (IL-6) and tumor necrosis factor (TNF- α)) to *Helicobacter pylori* compared to colonization in persons with other blood groups (Heneghan *et al.*, 1998). It has also been demonstrated that epithelial cells of persons with blood group O bound significantly more to *Helicobacter pylori* than cells of persons with other blood groups (Alkout *et al.*, 2000). Variation in the results of studies is related to different study communities and sample size that affect the power of analysis. Further study on the influence of genetic factors, *Helicobacter pylori*, life style and nutrition are suggested.

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