

## Relationship Between ABO Blood Groups and Insulin Resistance in Patients with Colon and Gastric Cancer

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### Abstract

**Objective:** The aim of this study is to examine the relationship between insulin resistance and ABO/Rh blood group systems.

**Materials and Methods:** A total of 58 patients diagnosed with 29 newly diagnosed colon cancer and 29 gastric cancer were admitted to Istanbul Medeniyet University Göztepe Training and Research Hospital between January 2010 and January 2012. HOMA-IR was used as the insulin resistance index. Patients were considered to have insulin resistance with HOMA-IR  $\geq$  2.5 and taken to work. Blood groups were recorded from patient files.

**Results:** A Rh(+) blood group was significantly higher in patients with gastric and colon cancer and insulin resistance. B Rh(-) blood group was not found in astalin which has insulin resistance.

**Conclusion:** This data suggests that A Rh (+) blood group individuals are more directly related to insulin resistance. B Rh(-) blood group is less directly related to insulin resistance.

**Keywords:** *Insulin Resistance; ABO Blood Subgroups; Rh System; HOMA-IR*

### Introduction

In recent years there have been studies examining the relationship between ABO and Rh blood groups and various metabolic and malign diseases. The fact that the individual ABO blood group was reported individually as a disease-susceptible phenotype in some diseases, was particularly interesting in the research in this regard. There are also studies in the literature related to clinical conditions such as duodenal ulcer, hypercholesterolemia and coronary artery disease [1-8] as well as malign diseases such as gastric cancer, salivary gland tumors, colon cancer, thyroid cancer, over cancer, breast cancer and pancreatic cancer [9-13]. In this study, it was aimed to investigate the relationship between insulin resistance and blood group in patients with stomach and colon cancer.

### Materials and Methods

This study evaluated a total of 58 patients diagnosed with 29 newly diagnosed colon cancer and 29 gastric carcinoma admitted to Istanbul Medeniyet University Göztepe Training and Research Hospital between January 2010 and January 2012. Patients were recorded from age, sex, height, weight, body mass index, blood groups and insulin resistance levels. HOMA-IR [Homeostatic model assessment-Insulin Resistance (HOMA-IR) = fasting insulin ( $\mu$ IU/ml)  $\times$  fasting glucose (mmol/ml)/22.5] was used as the insulin resistance index (1 mmol/l = 18 mg/dl). Insulin resistance was considered to be present in patients with HOMA-IR > 2.5 [14]. According to individual body mass indexes; (BMI 18-24.9 kg/m<sup>2</sup>), overweight (BMI 25-29.9 kg/m<sup>2</sup>) and obese (BMI  $\geq$ 30 kg/m<sup>2</sup>). Patients with newly diagnosed oral

malnutrition who did not have an impairment of working nutrition and who did not lose more than 10% of their body weight within 6 months during the study were included.

### Results

Twenty nine newly diagnosed colon cancer and twenty nine gastric cancer patients were included in the study. The mean age of the patients was 58 (min: 37-max: 86). Among 58 patients, 34 (59%) were female and 24 (41%) were male.

HOMA-IR			ABO and Rhesus Blood Groups							Total
			A(-)	A(+)	AB(-)	AB(+)	B(+)	O(-)	O(+)	
Negative (< 2.5)	Malignancy type	Colon	2	3	0	2	4	0	4	15
		Gastric	1	13	1	0	2	1	5	23
	Total		3	16	1	2	6	1	9	38
Positive (> 2.5)	Malignancy type	Colon		6			3	1	4	14
		Gastric		4			1	0	1	6
	Total			10			4	1	5	20
Total	Malignancy type	Colon	2	9	0	2	7	1	8	29
		Gastric	1	17	1	0	3	1	6	29
Total		3	26	1	2	10	2	14	58	

**Table:** ABO blood groups and insulin resistance in patients with colon and gastric cancer.

Insulin resistance was significantly higher in patients with colon cancer. 44% of the patients (26 patients) had A (+) blood group. In patients with gastric and colon cancer, 50% (10 patients) had a predominant blood group A(+) in the group with insulin resistance. In this study, B (-) blood group was not found in cases with both gastric cancer and colon cancer. The detection of a high rate in the A (+) blood group is considered to be a preliminary plan because it is a blood group more commonly detected in the community. However, the absence of B (-) blood group was thought to be protective blood group in the development of gastric and colon cancer.

### Discussion

Despite the evidence that the association of ABO groups with certain diseases is evident and that blood groups may play an important role in some diseases, such as peptic ulcer and stomach cancer [15], some studies report that there is no association between ABO [11]. Rahman., *et al.* [16] reported in a Bangladeshi study that there was no relationship between ABO blood groups and DM with a sample of 2312 patients and 8936 controls.

In another study conducted in India, 511 patients with type 2 diabetes mellitus were evaluated as a control group of 475 healthy individuals. In conclusion, there is no association between ABO blood groups and type 2 diabetes mellitus [17]. In a multicenter study from Lancashire, Cheshire and Oxford, A blood group was reported to be the more frequent blood group among male diabetes [18]. In Italy [19] and Trinidad [20], there were reports of increased frequency of B blood group in diabetics, but in Germany [21] and Glasgow [22] it was concluded that there was no significant relationship between ABO.

As it is clear from the above discussion, some populations show a positive relationship with ABO blood groups, but studies are needed in a larger population as there are studies suggesting the opposite. Studies have focused mainly on the relationship between diabetes mellitus and blood groups. In the literature, Aykaş F, *et al.* reported that individuals with A blood group were more directly related to insulin resistance and were less directly related to insulin resistance in patients with 0 blood group [23].

## Conclusions

In this study, there was a positive correlation between group A (+) and insulin resistance. However, we will need to study a larger sample to confirm our findings. Our results are interesting in terms of the negative association of B (-) groups with insulin resistance, which appears to have protective effect. However, there is a need for studies that have a large sample.

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