

## Special Article - Pancreatic Cancer

# Association of Blood Group Antigen Secretor Status and Diseases of the Gastrointestinal Tract

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## Abstract

Approximately 80% of the population secretes their blood group antigens in their saliva and other body fluids while others do not. These antigens in the digestive secretions have an association with the development of the diseases of the gastrointestinal tract.

In this context, we did a case control study to test if there is any association between the blood antigen secretor status and the development of various gastrointestinal diseases. We studied 178 people (92 males and 86 females) with various GI symptoms attended to Government Medical College, Trissur. The sample contained people of age ranging from 18- 85. We found the disease statuses of individuals using endoscopy (esophagogastroduodenoscopy and colonoscopy), biopsy and histopathological examination. We analyzed the results using Pearson chi square test. In conclusion we found no statistically significant association between secretor status and gastro intestinal diseases.

**Keywords:** Blood group antigen; Secretor; Gastro-intestinal diseases

## Introduction

In 1900 Karl Landsteiner described ABO blood grouping system for which he was awarded the Nobel Prize [1,2]. Since 1930, people are classified into secretors and non secretors depending upon their ability to secrete their blood group antigens in their saliva and other body fluids [3]. Interest in the association between gastro intestinal diseases and ABO group started with the discovery that blood group A secretors have a higher incidence of gastric cancer [4] and non-secretors are susceptible to an array of other gastrointestinal diseases such as peptic ulcer [5,6].

80% of the populations are secretors who secrete their blood group antigen in saliva [7]. Secretor status is determined by genetics, by the presence or absence of gene FUT2 on chromosome 19q13.3. About 20% of population lacks the so called secretor gene and thus cannot manufacture free unbound blood type antigens. These individuals are called non-secretors. Non-secretors have high incidence of diseases of mouth, esophageal cancer, and epithelial dysplasia as compared to secretors [8]. Non secretors often have more problems with low level infection such as candida and streptococcus. Non secretors are also known to be more prone to many forms of autoimmune diseases, such as Crohn's [9]. Some researches indicate that non secretors have a lower rate of development of gastrointestinal cancers [10].

A study about the development of these diseases in secretors and non-secretors of the population of Indian subcontinent was lacking the literature. In this background, we conducted a case control study to find out the association between blood groups and the secretor status with the various benign and malignant diseases of the gastrointestinal tract.

## Materials and Methods

We studied a total of 178 patients who attended the surgery

outpatient department, Government medical college, Trissur in the state of Kerala, India with symptoms attributable to diseases of gastrointestinal system. They were subjected to upper gastrointestinal endoscopy or lower gastrointestinal endoscopy depending upon their symptoms and were biopsied and subjected to histopathological examination. Those patients were then divided into Cases- the patients with a proven benign or malignant disease Controls- the patients who are proved to have no GI pathology

Subsequently their antigen secretor status was identified using internationally accepted agglutination reaction in the saliva, which was done as follows. 2-3 ml saliva of each patient were collected into a test tube and stored frozen at 0°C until sample analysis. For analysis, samples were incubated in a 100°C water-bath for 10 min to inactivate enzymes. They were centrifuged for 3000 rpm for 5 minutes. 3 test tubes were labeled for saliva and 3 for normal saline. One drop of dilute anti-serum (Tulip Diagnostics Pvt. Ltd., India) was added to each test tube. One drop of saliva was added to the tests and to controls one drop of saline was added. Then we added one drop of appropriate red cells to each tube. Agglutination was read with naked eye and microscope.

Blood groups were also determined using routine agglutination method. The results were analyzed statistically with Pearson chi-square test (software).

## Results and Analysis

Out of total 178 patients we studied (Table 1).

Age groups and blood group distribution were as follows (Table 2).

Total 178 (Table 4).

Disease distribution is as follows (Table 5).

**Table 1:**

Males	Females
92	86

**Table 2:**

Age Groups	
1. 0-20	3
2. 21-40	30
3. 41-60	93
4. 61-80	50
5. 81-100	2

**Table 3:**

Blood Groups	
A	37
B	59
O	69
AB	13

**Table 4:**

Secretors	Non-Secretors
135	43

**Table 5:**

Disease Distribution							
Benign				Malignant			
Oes-ophagus	Stomach	Small Intestine	Large Intestine	Oes-ophagus	Stomach	Small Intestine	Large Intestine
1	21	2	5	2	8	0	5

## Data Analysis

Secretor Status and Diseases (Table 6).

## Discussion

There are no data available regarding the secretor status of population of Kerala, India. Our study is the first attempt at describing the prevalence of secretors and non-secretors in the state of Kerala, India. Our results approximate to the prevalence described in other populations. The secretor status in Kerala does not appear to differ from what has been described elsewhere.

A case control study and meta-analysis by Zhiwei Wang et al says that there is significant risk of gastric cancer in a group than in non-A groups. It also says that O group has a reduced risk of gastric cancer than non-O groups [11]. According to the study by R. Doll, H.

**Table 6:**

	secretors	Non secretors	P value
Disease	31	13	0.926
Normal	104	30	
Benign	20	9	0.322
Normal	104	30	
Malignant	11	4	0.708
Normal	104	30	
Benign	20	9	0.763
Malignant	11	4	

Drane and Anda. C. Newellse cretion of blood group substances in duodenal, gastric and stomal ulcer, gastric carcinoma and diabetes, non-secretion of antigens has an association with peptic ulcer disease [12].

However in our study we found no association between blood antigen secretor status and diseases of GI tract. The reasons for that may be assumed to be various environmental and dietary differences in the study population or differences between ethnic groups.

## Conclusion

Despite the fact that many studies continue to suggest that there is an association between blood antigen secretor status and gastrointestinal disease, no statistically significant association was found in our study.

## Limitation

A control group of persons with no symptoms, with analysis of the secretor vs. non-secretor status of the group, is lacking. Hence these results warrant further studies including such a control group.

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