# ABO Blood Group in Patients with Peptic Ulcer Disease: Association with Secretor Status

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**Aims and objective of the study is to find ABO blood group association with secretor status in peptic ulcer disease patients. ABO blood grouping by direct agglutination test and secretor status by agglutination inhibition test. 50 controls and 50 endoscopically diagnosed PUD patients were selected. Blood group O is associated with duodenal ulcer but no association with secretor status was found.**
**Key words: ABO, blood group, secretor, PUD, peptic ulcer disease**

The blood groups are genetically determined antigens which are detected on red cell surface by using specific anti-sera. ABO is the most important blood group system. Individuals of A, B and AB groups contain A, B, and AB antigens respectively. People with A and B groups have anti-A and Anti-B antibodies respectively while group AB contains no antibodies. Blood group O has no antigen but has antibodies against A and B antigens. The antigens of ABO and Hh groups are synthesized by sequential addition of sugar residue to a common precursor substance by specific glycosyltransferases. The difference in the terminal sugar determines these antigens[1,2,3]. The individuals who secrete the water soluble substances A, B and H called glycoproteins, in saliva and other body fluids like gastric secretions, tears, urine, bile, milk, semen, amniotic fluid and some pathological fluids as well known as "secretors" where as others who lack this property are called non-secretors[4,5]. The antigens expressed on both the red cells and in the secretions are determined by the interaction of Hh, Sese, ABO and Lele genes[1,2,3].

There is an association between ABO blood groups and certain diseases. The strongest relationship is between duodenal ulceration and blood group O [6]. Over 90% of duodenal ulcer patients and 70% gastric ulcer patients are infected with Helicobacter Pylori (HP) [7]. The present study was carried out to find out the association of ABO blood groups in peptic ulcer disease with secretor status.

## Materials and methods

Fifty endoscopically diagnosed peptic ulcer patients were selected from medical units of Services Hospital, Sir Ganga Ram Hospital, and Mayo Hospital. Another 50 individuals from blood bank were taken as a control. ABO blood grouping was done on blood samples of patients and controls. One ml non-stimulated saliva was used for ABH secretor status analysis by Wiener agglutination inhibition test[5]. Both forward and reverse grouping were done by slide and tube methods described by Dacie and Lewis[8]. Potent anti-A, anti-B and control A, B and O Cells were used for grouping. Statistical analysis of Chi square test and "p" value were used to analyze the results and data in the present study.

## Results

The ABO blood group observed in controls were B= 36 %, O=34 %, A=22 and AB 8 % and peptic ulcer disease patients these were A=12%, B=26, O=58 % and AB 4%. The results are shown in table 1. The blood group O patients with duodenal ulcer were more as compared to other groups ($\chi^2$ =8.23 with 1 df, p = 0.005). Thus there is association between duodenal ulcer and blood group O.

Table 1 ABO Blood Group Distribution in Controls and PUD

| Blood Group | PUD% | Controls% |
|---|---|---|
| A | 12 | 22 |
| B | 26 | 36 |
| O | 58 | 34 |
| AB | 04 | 08 |
| Total | 100 | 100 |

Sex distribution of ABO Blood groups in Controls and PUD is shown in table 2. No association was found between duodenal ulcer and gender with reference to blood groups ($\chi^2$ =0.201 with 1 df, p>0.5).

Table 2 Frequency of ABO blood groups in male and female Controls and PUD patients

| Blood | Male | | Females | |
|---|---|---|---|---|
| group | Control ) | PUD | Control | PUD |
| A | 6(17..7%) | 4(11.8%) | 5(31.3%) | 2(12.4%) |
| B | 13(38.2%) | 8(23.5%) | 5(31.3%) | 5(31.3%) |
| O | 13(38.2%) | 20(58.8%) | 4(25%) | 9(56.3%) |
| AB | 2(5.9%) | 2(5.9%) | 2(12.4%) | 0 |
| Total | 34(100%) | 34(100%) | 16(100%) | 16(100%) |

The distribution of secretor status among control group and peptic ulcer disease patients was determined and the results are given in table 3 and table 4. When duodenal ulcer male and female patients were compared for association with secretor status, no association was found between any sex and secretor status. ($\chi^2$ =0.5829 with 1df, p >0.5).

Table 3 Secretor Status.

| Secretors status | PUD% | Controls% |
|---|---|---|
| Secretor | 76 | 80 |
| Non-secretor | 24 | 20 |

Table 4 Frequency of male and female secretor status in PUD patients and controls

| Blood group | PUD | | Control. | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| Sector | 27(79.4%) | 11(68.7%) | 28(82.4%) | 12(75%) |
| Non Sector | 7(20.6%) | 5(31.25%) | 6(17.6%) | 4(25%) |
| Total | 34(100%) | 16(100%) | 34(100%) | 16(100%) |

Association of male of female sex with secretor status
$\chi^2$=0.5829, df=1, p>0.5 (Non-significant)

## Discussion

It was found that in peptic ulcer patients group A=12%, B =26%, O =58% and AB=4% showing predominance of blood group O. Among them 40% were with blood group O who had duodenal ulcer. Similarly results were noticed in various other studies[9,10,11]. It was found in peptic ulcer patients that 76% were secretors with rest of 24% non-secretors (table3). Among males 56% were secretors and 14% were found to be non-secretors. On the other hand 24% females were secretor and 10% were non-secretors in peptic ulcer patients.

In a study carried out in Rawalpindi/ slamabad showed that secretors and non-secretors were 85.3% and 14.7% respectively. The male secretors were 81.6% as compared to 90.9% of the female secretors. Hook-Nikanne et al[12] found 80% of blood donors as secretor and 20% as non-secretors in Helsinki urban population. Lamey et al[13] (1994) found secretor as 64% and non-secretors as 36% in Sri-Lankan population.

Since the identification of blood groups in man, a relationship between different blood groups and certain diseases has been established. Blood group antigens are considered receptor as well as protective for microbial agents[14,15]. Bacterial colonization and ensuing inflammatory response may be influenced by the host expression of ABO blood group antigens[16]. Helicobacter pylori colonization and ensuing inflammatory response is more in blood group O patients[17]. There is a close correlation between H. Pylori and peptic ulcer[18]. Mentis et al[11] found similar findings where blood group O was over-represented among peptic ulcer patients. Non-secretors were predominating. The association with non-secretor status is not well defined.

The association between duodenal ulcer and different blood groups has been known for more than 40 years. Individuals with blood group O have a 30-40% higher incidence of duodenal ulcer than those of the remaining blood groups[9,10]. The adherence to the gastric epithelial cell is mediated by fucosylated blood group antigens associated with blood group O phenotype suggesting that it might explain the higher prevalence of peptic ulceration in individuals with blood group O[19]. The blood group O association is particularly evident with ulcers of the antrum and prepylorus. These are exactly the same parts of the stomach as where H. Pylori is most frequently found[12].

Alkout et al[17]suggested that H type 2, found on almost all individuals in a key receptors of H pylori and that the increase susceptibility of group O to peptic ulcer disease might be partly caused by higher density of colonization by these bacteria compared with other blood groups. High levels of inflammatory mediators in blood group O individuals might contribute to tissue damage leading to ulceration[20]. Fucose is the immunodominent sugar of the H antigen of blood group O. Adhesins of H. pylori that bind fucose have been identified[21]. Non-secretor status is not related to H. Pylori infection but is independently associated with endoscopic gastroduodenal disease[22].

Other workers failed to define any association between infection H pylori and blood group or secretor status[12,23,24]. Predisposition to H. pylori gastric antral infection is not associated with any ABO and secretor status[27]. Further carefully controlled studies are needed to find relationship between H. pylori, peptic ulcer disease and blood group antigens which may reveal the basis of this association. It is quite challenging that after so many years of study the basis of these associations between blood group antigens and duodenal ulcer remain unknown

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