**THE EFFECT OF ABO BLOOD GROUP CLASSIFCATIONS ON BIOCHEMICAL MARKERS OF KIDNEY FUNCTION IN HEALTHY ADULTS**

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 **ABSTRACT**

This study was aimed at evaluating the effect of ABO blood groups on biochemical markers of kidney function in healthy adult. A total of seventy (n=70) adult of both sexes were recruited into the study. All participants were assumed healthy provided they have not been on medication for a period of two weeks prior to their recruitment. Biochemical markers assessed are kidney function tests such as urea, uric acid, creatinine and total protein assay was also carried out. Blood group O has the highest frequency of 42 %, while AB has the lowest frequency of 12.9 %. The kidney function test the activity of creatinine and urea increased significantly (p< 0.05) decreased significantly in blood group A and O in blood group. Creatinine and urea may be an indicator of health status with respect to ABO blood group. This study emphasizes those participants with blood group A are of a good advantage of healthy status with respect to kidney function biomarkers.

**Keywords:** Biochemical markers, Liver function, ABO blood groups and xidant markers, clarify sed in the healthy adult.

INTRODUCTION

The blood groups are A, B, O and AB. The frequency of four main ABO blood groups varies in the population throughout the world. ABO blood group system derives its importance from the fact that A and B are strongly antigenic and anti A and anti B (Rashaduz et al., 2015). The ABH histo-blood group antigens are a set of polymorphic and inherited glycoconjugate structures that are expressed on the cell surface of human erythrocyte. The ABO blood group system is one of the strongest predictors of national suicide rate and a genetic marker of obesity. Nineteen blood groups systems with more than 200 antigens have been identified in man Some studies have also reported the association of ABO blood group with certain pathological conditions.

In addition to the aforementioned undeniable associations of ABO blood group with diseases, medical literature, especially prior to 1990, is replete with unusual examples of diseases or other conditions that were thought to be associated with, or caused by, blood group antigen-antibody reactions (Giancarlo & Massimo, 2013). In individuals with the secretor phenotype (Luiz and Haroldo, 2004). There are accumulating evidences that the ABO blood antigens might play a key role in various human diseases and also that a particular blood group may contribute to favor life-extension via biological mechanisms important for surviving or eluding serious disease (Claudia *et al*., 2014). The kidneys are one of the more important tissues examined. Because of its role in the filtration, metabolism, and excretion of compounds, it is often the site of test-article-induced lesions. In addition, a wide range of spontaneous renal lesions may be observed (John and Amy, 2019). ABO blood group antigens have been reported to be associated with inflammation and infections which have been largely implicated in the onset and progression of immune-mediated diseases (meng *et al*., 2017). Patients with blood group O have disadvantages in the allocation of deceased donor organs in the Eurotransplant Kidney Allocation System and fewer ABO-compatible living donors (Petra *et al.,* 2010).

**MATERIALS AND METHODS**

### Subjects inclusion criteria

### Grownup males and females between the ages of 18 to 45 years old, who have not been on any medication in the past two weeks prior to blood collection and willingly gave consent to be part of the research work were included in the work.

### Subjects exclusion criteria

Adults above the age of 45 years, children and teenagers were excluded from the research.

Adults within the research age categories who are either on medication or unwilling to participate in the research were also excluded from the study.

**Participants’ blood collection**

Blood samples were obtained by veni puncture using va­cutainers with heparin as anticoagulant. After gathering, it was instantly closed and retained in ice to prevent lysis. The samples were re­frigerated and immediately transported to the laboratory. The vacuum blood gathering tube was instantly centrifuged at 3000rpm for 10 minutes at room temperature. The sample plasma was aliquoted into labeled Eppendorf tubes and stored at -80⁰C. The plasma was used to quantify the kidney function biomarkers in the blood.

**RESULTS**

##### **Table 1: Effect of blood group classification on anthropometric parameters.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| BLOOD GROUPS | FREQUENCY OF OCCURENCE | PERCENTAGE (%) FREQUENCY | WEIGHT (Kg) | HEIGHT (m) | BMI (K/m2) |
| O | 30 | 42 | 67.43±1.5 | 1.67±0.1 | 25.39±1.5 |
| A | 11 | 15 | 74.09±5.4 | 1.67±0.1 | 27.14±2.0 |
| B | 20 | 28 | 70.62±3.4 | 1.64±0.1 | 27.38±2.0 |
| AB | 8 | 15 | 65.12±8.0 | 1.58±0.1 | 28.65±7.1 |

The values are expressed as mean±standard error of mean (SEM).

**TABLE 2: EFFECT OF BLOOD GROUP CLASSIFCATION ON KIDNEY FUNCTION MARKERS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Groups | O | A | B | AB |
| Frequency | 30 | 11 | 20 | 11 |
| UREA (mg/dl) | 46.6 ± 5.0b | 45.7 ± 5.8b | 59.3 ± 5.9b | 98.2 ± 17 .7a |
| CREATININE (mg/dl) | 0.88 ± 0.1 | 1.70 ± 0.4 | 1.41 ± 0.2 | 1.67 ± 0.7 |
| URIC ACID (mg/dl) | 4.03 ± 0.3 | 3.90 ± 0.0 | 3.92 ± 0.3 | 3.46 ±0 .6 |

The values are expressed as mean ± standard error of mean (SEM) of kidney function tests as indicated in the table 4.4. Superscript a ‘a’ and b ‘b’ indicates values that are significantly (p<0.05) different from each other.

**DISCUSSION**

**ABO BLOOD GROUP RELATIONSHIP WITH KIDNEY FUNCTION TEST AMONG THE PARTICIPANTS**

Renal failure underlies various etiologies among which are infectious and autoimmune origins which may link directly or indirectly with blood groups (Samar *et al*., 2015). This study reveals that the level of creatinine and urea acid shows no significant differences for all the ABO blood groups, but the level of uric acid shows significant difference in blood group O among the ABO blood groups. In the year 2015 Samar *et al*., showed in their work that renal failure patients exhibited more frequency with blood groups A and O. The blood group AB shows a significant (p <0.005) increase in urea level but the level of urea decreased significantly in blood group O and A. Uric acid level was high in blood group O among the ABO blood groups; although in this study only the level of specific biomarkers for kidney function were assessed, but several studies on have shown the association between the various blood types and renal failure which can arise due to maladies from this biomarkers. Hamed et al (1979) conducted a study to compare the frequency of ABO blood group distribution between renal patients and normal population. Study findings pointed to significantly increased renal patients in B and O blood groups compared with normal populations (p<0.01). Hassoon *et al.* (2013) conducted a study to investigate the relationship between hemodialysis patients and ABO blood grouping. Results showed that 55% of patients had blood group O, 25% group B, 10% blood group A, and 10% blood group AB.

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