



Evaluation of Pattern of Lipid Profile of Subjects With Different Abo Groups in Madonna University Elele Rivers State Nigeria

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Abstract

This study looked into how the lipid profiles of people with various ABO blood groups varied. 50 healthy patients with varied ABO blood groups were studied, including 12 A, 12 B, and 10 AB and 16 O blood groups, all of whom appeared to be in good condition and appeared to be asymptomatic. Men and women between the ages of 15 and 25 years old provided informed consent and met the inclusion criteria. Colorimetric measurements of serum lipid profiles were performed on blood samples collected in accordance with routine operating protocols. The results were expressed as MeanSD, and the means of the groups were compared using an analysis of variance (ANOVA). Values with $p < 0.05$ were considered significant, whereas those with $p > 0.05$ were not. Averages for TCH and TG in group A were 4.21 and 0.99 millimol/L, respectively. HDL and LDL were both 1.71 and 0.07 millimol/L higher in this group. TCH was 4.2 0.48 mmol/L, TG was 0.74 0.35 mmol/L, HDL was 1.6 0.62 mmol/L, and LDL was 2.26 0.45 mmol/L on average in group B. TCH (4.3 0.88 mmol/L), TG (0.96 0.49 mmol/L), HDL (1.8 0.52 mmol/L) and LDL (1.94 0.81 mmol/L) were found in the group AB patients. When the TCH, TG, HDL, and LDL mean values of the various ABO blood groups were examined, there was no significant difference ($p > 0.05$). This study's findings suggest that blood type has no effect on the serum lipid profile of healthy persons.

Introduction

In the context of lipids, hydrophobic compounds that are also soluble in alcohol, ether, and chloroform are described as lipids. Lipids, along with carbohydrates and proteins, are essential components of all living cells. As a building block and framework, they are correct to assert that they exist in both plant and animal cells.

In the blood and tissues, they are readily accessible because of their nature and importance. The primary function of lipid molecules is to provide the building blocks for biological membranes, such as phospholipids, glycolipids, and cholesterol. Triacylglycerol (commonly known as triglycerides or fats) is another type of lipid involved in energy storage. The liver produces bile salts, which aid in the digestion of dietary fat, by metabolizing cholesterol. Lipid-derived compounds also play a significant role in the regulation of the endocrine and nervous systems.

Every lipid molecule has a significant portion that is hydrophobic. Apolipoproteins, which are cofactors and ligands for lipid processing enzymes, are hydrophilic, spherical structures with

surface proteins that can be either apoproteins or apolipoproteins. All lipids, as previously established, are hydrophobic and largely insoluble in body fluids. As a result, lipoproteins are required for their transportation (Bowman & Wafi, 2017).

A lipid profile, commonly known as a lipid panel test, measures a person's risk of developing cardiovascular disease. cardiovascular disease, such as heart attack, can be exacerbated by high levels of cholesterol, particularly low-density lipoprotein (LDL), which is commonly referred to as "bad cholesterol." As oxidized low density lipoproteins enter the subendothelial region, low density lipoproteins move there and become macrophages, resulting in atherosclerotic plaques. Lipid levels may become aberrant due to aging, different illnesses, the use of certain medicines, and a high-saturated-fat diet (Lee, 2006; Bowman & Wafi, 2017).

This research suggests that a person's Lipid Profile and Blood Group may be linked. Karl Landsteiner observed in the early 20th century that some people's Red blood cells agglutinated when they came into touch with the serum of others. His finding led to a scientific breakthrough and minimized the catastrophic repercussions of blood transfusion, which sometimes result in death due to an incompatible type of ABO blood being transfused (Iheanacho et al., 2018; Edgren et al., 2010).

Red blood cell responses with serum, according to Landsteiner, can be explained by the presence of antigens on the red blood cell and antibodies in the serum. When the antigens on red blood cells reacted with the antibodies in the serum, agglutination could be recognized. In addition to A and B, AB and O blood groups were later introduced as a result of the antigens released by the Red blood cell. There were no characteristics of blood groups A or B in blood group O. However, there were similarities between blood groups A and B in blood group AB (Edgren et al., 2010).

An individual's immune system creates antibodies against any ABO blood group antigen that is not present in the Red blood cell of that individual. Blood groups A, B, and O all have anti-B antibodies, whereas blood groups A and B both have anti-A antibodies, and blood group O has antibodies against both A and B. Both anti-A and anti-B antibodies are absent in blood group AB (Daniel & Bromilow, 2007).

Other than advancing the field of blood transfusion medicine, the identification of these molecules has provided important information about the various patterns and strains of physiological activity and disease that persons of various blood groups are susceptible to. Even while no diseases have been shown to occur from the lack of expression, there are vulnerability patterns that may be linked to an individual's ABO phenotype. Blood group O, for example, is thought to have around a quarter less FVIII and Vwf in their plasma than other blood groups. The higher risk of ischemic heart disease and thromboembolic disease may also be a result of increased amounts of FVWIII and VWF in their plasma, which causes excessive bleeding. People with blood types other than O have an increased chance of developing vascular diseases (Wong et al., 1992). This should be thoroughly checked.

There may be some variation in the patterns of lipid profiles among subjects with different ABO groups at Madonna University in Elele Ngeria, and this study aims to shed light on the differences in susceptibility to diseases of the body's integral systems of lipids that exist among people of different blood groups and to aid in the fight against health issues like cardiovascular disease.

If the majority of the students at Madonna University belong to the blood group most likely to have high levels of circulating triglycerides, which increases their risk of cardiovascular disease, understanding the patterns of lipid profile among those with different ABO blood groups will be helpful. For medical laboratory scientists, doctors, nurses, and other medical care providers, the findings of this study will be of enormous importance.

Methods

Study Area

The research was done at the MUTH Elele campus in River State, Nigeria, which is affiliated with the Madonna University Teaching Hospital. Nigeria's southernmost city, Elele, is located in the state of Oyo. Its coordinates are 5° 27' -5" N, 6° 55' -7° 85' E. The area has a tropical climate, with daily temperatures averaging 29°C for the most of the year. Between 217 and 240 centimeters of rain falls here every year. As well as Isiokpo, Omagwa, Omoku and other settlements in the immediate vicinity of Elele are a slew of smaller communities.

Sample Population

Students at Madonna University's Elele Campus were asked to provide blood samples for testing. The study's target population consisted of 50 people of various ABO blood groups (male and female). Everyone who participated is between the ages of 15 and 25 at the time of their participation.

Sample Collection

5 ml of fresh venous blood was drawn from the cubital vein using a sterile needle and syringe, and 2 ml of the blood was discharged into an EDTA anticoagulant container for use in the ABO blood grouping.. lipid profile was also estimated by adding 3ml of blood into a simple container. After an hour of clotting, the blood in the container was spun at rpm for 5 minutes. Micropipettes were used to remove serum from clots and store it in sterile simple tubes prior to use in the freezer.

Prior to the collection of samples, the individual's permission was asked.

Laboratory Assay

The determination of Blood Group was done by Tile Method [8], Determination of lipid profile was carried out by Standard method (Tietz, 2006)

Statistical Analysis

The statistical software SPSS version 20 for Windows 7 was used to analyze the data. The data was presented as a mean standard deviation (S.D.). The independent sample t-test was used to compare the means of the data in this study, and significant values were defined as $p < 0.05$ and non-significant as $p > 0.05$.

Results and Discussion

Table 4.1 compares the lipid profiles of various blood types. TCH was found to be 4.6 0.97 mmol/L, TG was 0.71 0.39 mmol/L, HDL was 2.04 0.58 mmol/L, and LDL was 2.11 1.2 mmol/L in the participants in group O. Averages for TCH and TG in group A were 4.21 and 0.99 millimol/L, respectively. HDL and LDL were both 1.71 and 0.07 millimol/L higher in this group. TCH was 4.2 0.48 mmol/L, TG was 0.74 0.35 mmol/L, HDL was 1.6 0.62 mmol/L, and LDL was 2.26 0.45 mmol/L on average in group B. TCH (4.3 0.88 mmol/L), TG (0.96 0.49 mmol/L), HDL (1.8 0.52 mmol/L) and LDL (1.94 0.81 mmol/L) were found in the group AB patients. When the mean values of TCH, TG, HDL, and LDL were compared between the groups, there was no significant difference ($p > 0.05$).

No significant ($p > 0.05$) differences in TCH, TG, HDL or LDL were found in the multiple comparisons of each group when compared to each other.

Table 1. Lipid profile (mmol/L) of different ABO blood groups of the subjects

Blood group	TCH	TG	HDL	LDL
O	4.6 ± 0.97	0.71 ± 0.39	2.04 ± 0.58	2.11 ± 1.2

A	4.2 ± 0.99	0.99 ± 0.63	1.71 ± 0.7	1.83 ± 0.84
B	4.2 ± 0.48	0.74 ± 0.35	1.6 ± 0.62	2.26 ± 0.45
AB	4.3 ± 0.88	0.96 ± 0.49	1.89 ± 0.52	1.94 ± 0.81
F value	0.672	1.211	1.388	0.537
p-value	p>0.05	p>0.05	p>0.05	p>0.05
Post hoc				
O vs A	p>0.05	p>0.05	p>0.05	p>0.05
O vs B	p>0.05	p>0.05	p>0.05	p>0.05
O vs AB	p>0.05	p>0.05	p>0.05	p>0.05
A vs B	p>0.05	p>0.05	p>0.05	p>0.05
A vs AB	p>0.05	p>0.05	p>0.05	p>0.05
B vs AB	p>0.05	p>0.05	p>0.05	p>0.05

P<0.05 (Significant)

p>0.05 (Not significant)

As a result of this investigation, researchers were able to identify which ABO blood groups are more prone to suffer from cardiovascular disease.

Total cholesterol (TCH), triglycerides (TG), high density lipoproteins (HDL) and low density lipoproteins (LDL) levels in the blood did not differ significantly among the various ABO blood groups, according to this study. There was no significant difference between different blood types and cardiovascular disease and the prevalence of the major cardiovascular risk factors in individuals who had coronary artery bypass grafts (Sadeghian et al., 2016). According to (Mehrzhad et al., 2014); Rahma, K., Capuzzo, E., Bonfanti, C., Frattini, F., Montorsi, P., Turdo et al., 2016) there was no correlation between an individual's ABO blood group and their serum lipid profile. There was no correlation between total, HDL and LDL cholesterol and ABO blood groups in a study by (Chinello et al., 2018); however, those with B antigen (B+AB) had a greater triglyceride level than those who did not have it. According to (Grover et al., 2015) studying in Abo Metropolitan found that individuals with blood group A were more genetically prone to cardiovascular disease than those with blood group O. Ischemic heart disease can worsen if hypercholesterolemia is present Bowman & Wafi. Other risk factors for cardiovascular disease include high LDL cholesterol, low HDL cholesterol, high triglyceride levels, and decreased HDL cholesterol [14]. This relationship is true regardless of sex or age.

The lipid profiles of the three ABO variations were not significantly different in our investigation, as previously reported (Meade et al., 2014). The total cholesterol, triglyceride, and low density lipoprotein levels in blood type AB individuals were shown to be greater than those in other blood groups. Blood group AB also has lower levels of HDL (high density lipoprotein). In this way, it may be concluded that patients with the blood group phenotypic AB are more susceptible to ischemic heart disease than those with blood groups O, A, or B. According to Girgla et al. (2011). Farah et al. (2017). phenotypic AB is associated with serum lipid parameters in north Indian and Saudi Arabian populations, respectively. People with blood group AB may be at a higher risk of developing cardiovascular disease since high levels of serum cholesterol and poor high density lipoprotein cholesterol are known risk factors (Nydegger et al., 2003).

Conclusion: The lipid profile characteristics in the analyzed population did not differ significantly between ABO blood groups, according to this study. Family history may have an essential role in the development of risk factors for cardiovascular disease because lipid profile is a genetic component. More extensive research is needed to corroborate the findings, particularly the link between blood group AB and Rhesus and lipid profile.

Conclusion

Researchers were able to identify which ABO blood groups are more prone to suffer from cardiovascular disease. Total cholesterol (TCH), triglycerides (TG) and high density lipoproteins (HDL) levels in the blood did not differ significantly according to this study. Ischemic heart disease can worsen if hypercholesterolemia is present Bowman & Wafi. People with blood group AB may be at a higher risk of developing cardiovascular disease since high levels of serum cholesterol and poor high density lipoprotein cholesterol are known risk factors. According to Girgla et al. (2011), phenotypic AB is associated with serum lipid parameters in north Indian and Saudi Arabian populations..

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