ASSESSMENT OF ABO AND RH D BLOOD GROUPS IN PATIENTS ATTENDING HIV/AIDS CLINIC FEDERAL TEACHING HOSPITAL GOMBE

***[1]Aliyu, S.M., [2]Gatuwa, A. and [3]Dimas, Y.**
[1]Histopathology Department, Federal Teaching Hospital,Gombe
[2]Haematology Department, Federal Teaching Hospital,Gombe
[3]Histopathology Department, Federal Teaching Hospital,Gombe
*Correspondence Author: sanialiyu6@gmail.com +2347034562948

ABSTRACT
Background: ABO blood group system was the first human blood group system to be discovered. Subsequent to the discovery of blood groups by Landsteiner and advancement in its study, many workers tried to find a associations between blood groups and the incidence of various diseases.
Aim: The overall aim of the study is to assess the frequency distribution of ABO and Rh blood group in HIV confirmed cases within the study area and to determine if there is significant association in the distributions between the HIV/AIDS seropositives and the controls.
Methodology: Blood groups were ascertained using the standard tube method from 500 patients who were HIV seropositive enrolled at HIV/AIDS clinic in Federal Teaching Hospital, Gombe in Gombe state, Nigeria. The results were compiled and statistically analyzed.
Result: Blood group O was the most prevalent blood group 256(51.2%). B was next commonest group 119(23.8%), A 110(21.0%) and AB 15(3.0%) blood group was the least prevalent in the study population. Rh positive was found to be common in seropositive population 484(96.8%) and Rhesus negative 16(3.2%).Significant difference was observed in blood groups for the categories of subjects studied showing that no particular blood group type could be linked to the occurrence of HIV infection.
Key words: HIV seropositive, ABO, Rh blood groups, Incidence

INTRDUCTION

The ABO (H) and Rhesus (Rh) antigen systems are the formal blood group nomenclature used in modern haematology. The differentiation of blood groups using the ABO system is reflective of genetic differences in surface antigens expressed on blood erythrocytes, A, B and neither respectively, and consequently different plasma antibodies. The Rh blood grouping, so-called because it was first studied in rhesus monkeys, is used to describe the presence or absence of the D antigen on the surface of erythrocytes and is usually designated alongside the ABO grouping.

Individuals are divided into four major blood groups A, B, AB and O according to the presence or absence of antigens and agglutinins (Buseri and Okwonkwo, 2014). In addition, human red cells that contain antigen D are known as Rh positive while those without antigen D in their RBC's are Rh negative (Erhabor *et al*, 2013).Approximately 400 blood-grouping antigens have been identified; ABO and Rh D are the most frequently studied genetic markers in humansApart from their importance in blood transfusion practice. They are very useful in genetic studies ofpopulations and in resolving medico-legal issues like disputed parentage(Pughikumo *et al,* 2014)

Associations between ABO blood groups and certain diseases have been described that include the association between blood group O individuals with increased incidence of duodenal ulcers and gastric carcinoma (Rugge,2015; Liumbruno, 2013).

Associations between ABO and Rh blood groupings and increased susceptibility to certain diseases, such as ischaemic heart disease in men, cancer , and childhood asthma have been documented. Research examining the link between ABO Rh blood groups and schizophrenia has suggested that Rh incompatibility may be a risk factor (Gaidaa *et al*,2016) implying a possible role for genetic susceptibility.

Human Immunodeficiency Virus (HIV) was reported first in United State of America in 1981 but the causative agent was not identified until 1983. The agent was later named Human Immunodeficiency Virus. About 3.2 million people are currently infected with the virus (Awofala and Ogundele,2018).

Nigeria is the tenth largest country in the world, and the most populous country in Africa (Entonu andAgwale, 2007).

In view of the previous links between different disease conditions and blood groups systems, this study is therefore, focused on assessing the frequency distribution of ABO and Rh blood group among HIV confirmed patients attending HIV/AIDS clinic, Federal Teaching Hospital, Gombe. It is expected that the findings from this study would probably be of help in blood transfusion services particularly in this locality by providing better understanding of the particular blood group type linked to higher incidence of HIV infection to ease donors selection thereby providing a correlation between the subjects

MATERIALS AND METHODS

Within the duration of the study, 500 subjects attending the HIV/AIDS clinic and 500 negative controls from blood donors at haematology department(blood bank) of FTH Gombe State, Nigeria were enrolled respectively.657 were males while 343 were femaleswhich carters for the years of the study. Blood samples were collected after patient's informed consent was obtained. ABO and Rh D blood grouping were carried out and recorded.

Exclusion criteria

HIV seropositive individuals below 17 and above 65 years of age to reciprocate those used as controls that uses the same range as a criteria for donation.

Limtations

No subgroups of the ABO and Rh blood groups were determined.

Study Design

Experimental study design was used.

Sample Collection

The vacutainer method of blood collection into EDTA tubes was used. All specimen tubes were appropriately marked with identification after being obtained from the median cubital vein.

HIV Screening and Confirmation

The subjects were screened using rapid screening kits (Determine,Unigold and StatPak), HIV seropositive status was confirmed. CD4 count was done for all confirmed subjects according to the clinic guidelines by immunology Department of FTH,Gombe to serve as a supplementary support for the screening.ABO and Rh (cell) grouping was determined using standard tube method as described by Dacie and Lewis (2008).

Statistical Analysis

Data obtained was processed using statistical package for social sciences (SPSS) version 20.0 and chi-square was used for comparison.

Table 1: ABO Blood Groups Distribution Among The Subjects And Control

Bloodgroup	Hiv statusPositive(%) Control(%)		Total(%)
A	88(44.4)	110(55.6)	198(100)
B	95(44.4)	119(55..6)	214(100)
O	312(54.9)	25645.10	568(100)
AB	5(25)	15(25)	20(100)
Total	500(50)	500(50)	1000(100)

$X^2 = 15.657$; df = 3; p value = 0.001. Table above shows that there is significant association between HIV infection and ABO blood group (P value is < 0.05).

Table 2: Pattern of Rh factor distribution among the blood groups

Rh factor	Hiv status		Total (%)
	Control (%)	Positive (%)	
Positive	489(50.3)	484(49.7)	973(100)
Negative	11(40.7)	16(59.3)	27(100)
Total	500(50)	500(50)	1000(100)

$X^2 = 0.952$; df = 1; p value = 0.44. The above table shows that there is nosignificant association between Rh D blood group and HIV/AIDS infection (P > 0.05).

Table 3: Gender Distribution

GENDER	Hiv Status		TOTAL (%)
	Control (%)	Positive (%)	
Male	453(68.9)	204 (31.1)	657 (100)
Famale	47 (13.7)	296 (86.3)	343(100)
Total	500 (50)	500 (50)	1000 (100)

$X^2 = 27.131$; df = 1; p value = 0.000.The table above shows that there is significant association between HIV – positivity in female population (86.3%) as compared to control (13.7%) (P value < 0.05)

DISCUSSION

Many studies from the world have researched probable association between blood group and HIV infection. Very few large-scale studies have been conducted in Nigeria to know the distribution of blood groups of HIV seropositive population. This study reveals no significant association between Rh D blood group and HIV infection.

In Adamawa state Northeastern Nigeria, prevalence of HIV serotypes is significantly higher (97.8%) among Rh D positive subjects than their Rh D negative counter parts in which 2.2% was recorded (Abulazeez *et al,* 2008) in concordance with the current study where 96.8% and 3.2% for positive and negative respectively, possibly because they share the same geographical location and country. Similarly, based on susceptibility to infections, Rh D positive subjects were higher in this research work though sample size need to be increased to ascertained that.

The current study showed that among the HIV seropositives, blood group O was observed to be the highest with 246 (51.2%) individuals,followed by B 119 (23.8%), A 110 (22.0%) and 15(3.0%) individuals had AB blood group which concur with (Abulazeez *et al,* 2008) revealing similar outcome. However, The present study shown that out of total subjects studied, blood group O had the highest prevalence , with HIV seropositives 256(45.1%) and 312(54.9%) negative control.

In most of literatures reviewed in this study, it shows that distributions of ABO blood group in Nigeria and some countries shows blood group O as the commonest, followed by A, B and AB respectively.There is a little disagreement with the current research, where out of the 500 HIV seropositives 256(51.2%) were blood group O had the highest frequency, followed by 19(23.8) B group, 110(21.0%) A group and the least frequency were observed in AB blood group 15(3.0%).

This study shows that among the subjects, 343 were female out of which 296 (86.3%) were HIV seropositives while the negative control were 47 (13. 7%)as compared to the males due to the fact that female gender don't readily come for blood donation due to some physiological reasons that includes menstrual blood lose and breast feeding etc).However, the female test group (HIV-seropositive individuals) was much higher than the males possible because they constitute an important reservoir of HIV transmission to the general population through their sexual network and also polygamy.

CONCLUSION

This study reveal no significant association between both Rh D and ABO blood group with HIV infection possibly because of the small number of subjects used in the study. Larger nation-wide studies involving more number of patients would be required to rule out any association between blood groups and HIV infection.

Recommendation

Based on this research, probable association between blood group, HIV infection and locations in the country should be made through conducting similar researches throughout the country with more emphasis on a larger population including other common viral infections is also recommended.

REREFERNCES

Abdulazeez, A. A., Alo,E. B., Rebecca, S. N. (2008).Carriage Rate of Human ImmunodeficiencyVirus (HIV) infection among different ABO and Rhesus blood groups in Adamawa State, Nigeria*Biomed Res*., **19**(1), 41-4.

Awofala, A. A., and Ogundele, O. E. (2018). HIV Epidemiology in Nigeria. *Saudi Journal of Biological Sciences*, ***25***(4), 697-703.

Buseri F. I., and Okonkwo, C. (2014)Abnormal Hemoglobin Genotypes and ABO Rhesus Blood Groups Associated with HIV Infection among HIV-exposed Infants in North Western Nigeria. *Jnl Pathology and Laboratory Medicine International* Volume 2014:**6** Pages 15—20.

Dacie J. V and Lewis S.M., (2008) Practical Textbook of Haematology 7th Edition Edinburgh Church Livingstone,Pp365-367.

Entonu, P. E., and Agwale, S. M. (2007). A Review of the Epidemiology, Prevention and Treatment of Human Immunodeficiency Virus Infection in Nigeria. *The Brazilian journal of infectious diseases* : An official publication of the Brazilian Society of Infectious Diseases, 116, 579-90.

Erhabor, O., Isaac, Z., Yakubu, A. and Adias, T. C. (2013). Abortion, Ectopic Pregnancy and Miscarriages in Sub- Saharan Africa: Challenges of Rhesus Isoimmunisation in Rhesus Negative Women 3, 15-26.

Gaidaa K.B., Amin, A., and Saad, S.H., (2016)," Relationship between ABO Blood Groups and Helicobacter Pylori Infection among Patients with Dyspepsia, *Journal of Virology & Microbiology* , **Vol**. 2016 (2016), Article ID 688370, DOI: 10.5171/2016. 688370

Liumbruno, G. M. and Franchini, M. (2013). Beyond Immunohaematology: The Role of the ABO Blood Group in Human Diseases. *Blood transfusion*, ***11***(4), 491.

Pughikumo, D.T., Onyebuagu, P.C. and Pughikumo, O. C. (2014) A Preliminary Study Of Blood Groups Among Students In Bayelsa State.*Int. Journal of Basic,Applied and Innovative Research* ASN-PH-020919 ISSN: 2315-5388, 2014, **3**(1):19 - 22

Rugge, M., Fassan, M. and Graham, D. Y. (2015). Epidemiology of gastric cancer. *Gastric Cancer* (pp. 23-34). Springer, Cham.

Sharha, D.C., Rai,S., Jain,B. and Soa,S. (2013) Prevalence and Distribution of ABO and Rh-D Antigen along with its Subgroups and Rare Types in Greater Gwalior Region. *Open journal of Blood diseases* **3**(02),69.