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ABO and Rh Blood Group Distribution and its Relationship with Coagulation Factor VIII among Healthy Ghanaians

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Abstract

The ABO and Rh blood group systems play essential roles in transfusion medicine and have been implicated in the risk of thrombotic and hemorrhagic disorders through their influence on coagulation factors. This study assessed the distribution of ABO and Rh blood groups and their relationship with coagulation factor VIII (FVIII) levels in healthy Ghanaians. A cross-sectional study was conducted among 118 adults aged 18–60 years at three hospitals in Tema, Ghana. Blood groups were determined using standard agglutination methods, and FVIII antigen (FVIII:Ag) levels were measured using ELISA. Complete blood counts were analyzed to assess hematological parameters. The distribution of ABO groups was: O (28.0%), A (26.3%), B (24.6%), and AB (21.2%), with 90.7% of participants being Rh-positive. Mean FVIII:Ag levels did not significantly differ across ABO groups (p = 0.714), and no significant association was found with Rh status. Interestingly, group O individuals had the highest mean platelet volume (MPV), and a weak negative correlation was observed between FVIII:Ag and MPV (r = –0.205, p = 0.039). Age and sex showed no significant influence on FVIII:Ag levels. These findings suggest that while the ABO and Rh distributions in this Ghanaian cohort align with expected regional patterns, their impact on FVIII levels may be less pronounced compared to other populations. The novel observation of elevated MPV in group O individuals warrants further investigation. Understanding the interplay between blood groups and coagulation factors in African populations is essential for refining risk assessments for thrombotic and bleeding disorders.

Keywords: *ABO Blood Group, Ghanaian Population, Factor VIII, Rh Factor.*

Introduction

The ABO blood group system, first identified by Karl Landsteiner in 1900, is the most clinically significant of the 36 known human blood group systems and is designated No. 001 by the International Society of Blood Transfusion [1, 2]. While best known for its role in blood transfusion compatibility, the ABO system extends beyond red blood cells, with its carbohydrate antigens (A, B, H) expressed on a wide range of cells, including platelets, epithelial cells, and vascular endothelial cells [3, 4]. Because of this broad tissue distribution, ABO antigens are considered histo-blood group antigens, playing critical roles not only in transfusion reactions and organ transplantation but also in susceptibility to diseases.

The ABO system has four main phenotypes A, B, AB, and O whose incidence varies widely across populations. In the United States, AB is least common (4%), followed by B (10%), A (41%), and O (45%), with 85% of Caucasians and 95% of Black Americans being Rh-positive [5, 6]. In Nepal, O is most common (34.9%), while in sub-Saharan Africa, including Tanzania and Ghana, blood group O predominates, accounting for over 50% of the population, and Rh-positivity exceeds 90% [7-9].

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Beyond transfusion medicine, ABO blood groups have been linked to susceptibility to several diseases, including urinary tract infections, diabetes mellitus, gastric cancer, cardiovascular diseases, and even lifespan differences [5, 10-12]. One of the most intriguing associations is the relationship between ABO groups and thrombotic risk. Studies, especially from Europe and North America, have consistently shown that non-O blood groups are associated with elevated levels of von Willebrand factor (vWF) and coagulation factor VIII (FVIII), both key players in hemostasis [5, 13]. Individuals with blood group O typically have ~25% lower vWF and FVIII levels compared to non-O individuals; within non-O groups, AB shows the highest levels, followed by B and A [5]. This biochemical difference partly explains the two- to four-fold increased risk of venous thromboembolism observed in non-O individuals compared to those with group O.

However, much of the current knowledge on the ABO–vWF–FVIII relationship comes from studies in Caucasian and Asian populations, with relatively little data available from African populations, including Ghana. Additionally, few studies have examined the interaction of ABO groups with full blood count (FBC) parameters, such as platelet count and mean platelet volume (MPV), or assessed whether factors like age and sex modify these relationships. Considering that both genetic and environmental factors may influence hemostasis in African populations, there is a need for local data to better understand potential differences.

Materials and Methods

Study Area

The study was conducted in Tema, located in the Tema Metropolitan Area (TMA) within the Greater Accra Region of Ghana. TMA is a coastal metropolis bordered by Kpone Katamanso and Ningo-Prampram Districts to the northeast, Ledzokuku-Krowor Municipal to the southwest, Adenta Municipal and Ga East Municipal to the northwest, Akuapim South District to the north, and the Gulf of Guinea to the south [14]. The Ashaiman Municipal is an enclave within the TMA. The metropolis spans approximately 396 km², with Tema as its capital, situated within the coastal savannah zone. Tema's geographic coordinates are 5°40′0.0012″ N latitude and 0°0′0.0000″ E longitude. According to the 2010 Population and Housing Census, the total population of TMA was 292,773, and recent estimates by the Ghana Statistical Service (GSS) report a population of 310,853, with a density of 784 people/km²—significantly above the national average of 124 people/km² [14].

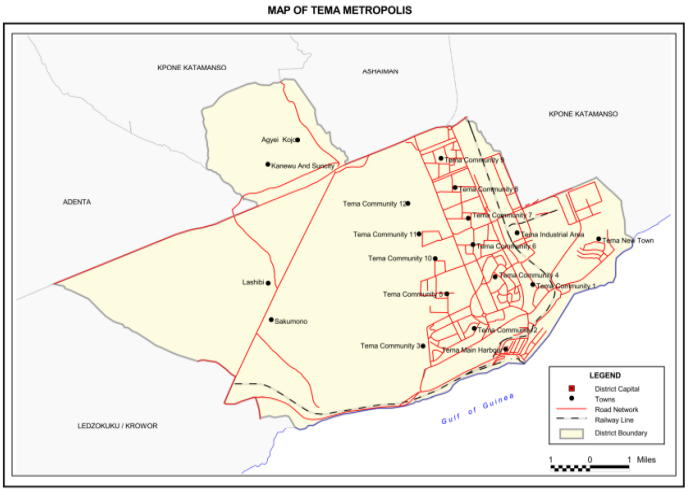

Figure 1. Map of Tema Metropolis, Indicating the Study Area [15]

Study Design

This was a prospective, analytical cross-sectional study conducted between July and September 2022. After obtaining ethical clearance, 118 healthy adults aged 18–50 years were recruited from the Tema Metropolis, based on predefined inclusion and exclusion criteria. Laboratory analyses were performed at the Hematology Unit of Tema General Hospital (TGH) Laboratory and Wenchi Methodist Hospital. Prior to sample collection, participants were interviewed, and detailed personal, family, medical, and drug histories were obtained. Written informed consent was secured from all participants.

Study Population

Participants included healthy individuals visiting Tema General Hospital, VALCO Hospital, and Trust Clinic for blood donation or routine medical check-ups. Healthy was defined as individuals without a history of deep vein thrombosis, liver or kidney disease, hypertension, acute sepsis, hemophilia A, hemophilia B (Christmas disease), von Willebrand disease, or other coagulopathies.

Sample Size and Method

For this study, the sample size was determined by referencing the methodology of [5], who conducted a comparable study on ABO blood groups and coagulation factors. Based on their minimum sample size and considering the study objectives, a target of at least 120 participants was established to ensure adequate statistical power and meaningful analysis. Simple random sampling method was used in the selection of participants until the minimum sample size for the study was exceeded

Inclusion Criteria

The study included healthy individuals aged 18–55 years who visited the participating health facilities for routine medical examinations, blood donation, or while accompanying relatives. Both males and females were eligible for inclusion. Additionally, Ghanaian nationality was a prerequisite for participation.

Exclusion Criteria

Individuals were excluded if they had a history of deep vein thrombosis, hemophilia A, hemophilia B (Christmas disease), von Willebrand disease, or any other coagulopathy. Additional exclusions included those with liver disease, kidney disease, hypertension, acute sepsis, or individuals taking medications that affect clotting factor activity, such as warfarin. Persons younger than 18 years or older than 55 years were excluded, as were pregnant women due to their prothrombotic state. Furthermore, individuals with chronic inflammatory disorders, hyperlipidemia, cerebrovascular disease, psychiatric illness, malignancy, smoking history, prolonged immobilization, or paralysis were also excluded from the study.

Determination of Blood Types

The blood group of each participant was determined by using both the forward and reverse typing methods of tube typing. The ABO forward typing and Rh typing were done simultaneously using the tube method. For each participant, a 3 to 5% suspension of their red cells was prepared using normal saline. The ABO forward grouping results were confirmed using the ABO reverse grouping.

Measurement of Full Blood Count

Two milliliters of venous blood were collected from each participant into tubes containing the anticoagulant ethylenediaminetetraacetic acid (EDTA). The samples were gently mixed to ensure proper anticoagulation and then analyzed for full blood count (FBC) parameters.

Analysis of FVIII: Ag using Quantitative Sandwich ELISA

The concentrations of factor VIII antigen (FVIII:Ag) in participant samples were analyzed at Wenchi Methodist Hospital using

the MR-96A microplate reader (Mindray) and ELISA kits from Melson Shanghai Chemical Ltd. (Melson Shanghai Chemical LMT). Plate washing was performed using the BIO-RAD PW40 automatic microplate washer, a compact, programmable device equipped with an eight-channel washing comb, a vacuum pump, and built-in dispensing pumps.

The ELISA assay followed the quantitative sandwich principle for measuring FVIII:Ag in human serum, cell culture supernatants, and other biological fluids. In this method, microtiter plate wells pre-coated with purified human factor VIII antibody serve as the solid-phase capture antibody. Samples containing FVIII:Ag were added to the wells, where the antigen bound to the immobilized antibody to form an antibody–antigen complex. A secondary antibody conjugated with horseradish peroxidase (HRP) was then added, forming a "sandwich" complex: antibody–antigen–enzyme–antibody.

After thorough washing, tetramethylbenzidine (TMB) substrate was added. The HRP enzyme catalyzed the conversion of TMB to a blue-colored product. The reaction was stopped by adding sulfuric acid, changing the solution to yellow, and the absorbance was measured spectrophotometrically at 405 nm. The FVIII:Ag concentrations in the samples were determined by comparing their optical densities (ODs) to a standard curve generated using known standards provided in the ELISA kit.

Results

Socio-Demographic Characteristics of the Study Participants

Among the 118 participants, 75 (63.6%) were male and 43 (36.4%) were female. The largest age group was 31–40 years, accounting for 44 participants (37.3%), followed by the 20–30-year group with 36 participants (30.5%). Regarding marital status, 75 participants (63.6%) were married, while 43 (36.4%) were single as represented in Table 1.

Table 1. Socio-Demographic Characteristics of the Study Participants

Variables Categories		**Frequency (%)**	
Age	20-30	36	(30.5)
	31-40	44	(37.3)
	41-50	28	(23.7)
	51-60	10	(8.5)
Sex Marital Status	Male	75	(63.8)
	Female	43	(36.4)
	Single	43	(36.4)
	Married	75	(63.6)

Data Presented in Frequencies with Corresponding Percentages in Parentheses

Distribution of ABO and Rh Blood Groups among Study Participants

Table 2 present with the number and percentage distribution of ABO and Rh blood groups among the study participants. Blood group O was the most predominant at 28.0%, followed by group A at 26.3%, group B at 24.6%, and group AB at 21.2%. Additionally, the vast majority of participants (90.7%) were Rh D positive.

Table 2. Number and Percent Distribution of Blood Groups of the Study Participants (N=118)

Blood Group	Number	Frequency (%)
A	31	26.3%
B	29	24.6%
O	33	28.0%
Total (N)	**118**	**100%**

Data Presented in Frequencies with Corresponding Percentages. N=Total Number

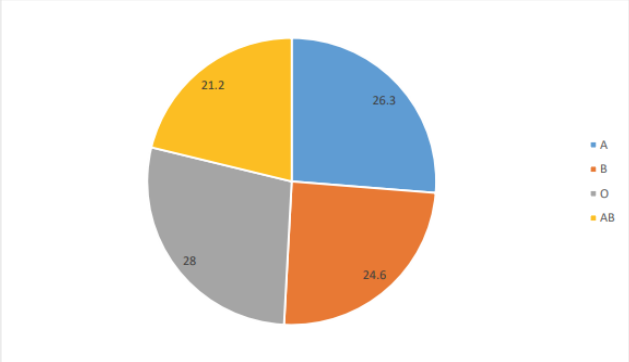

Figure 2. Distribution of Study Participants based on ABO Blood Groups (N=118). Total Number of Study Participants; A: Blood Group A; Blood Group B; AB: Blood Group AB; O: Blood Group O

Participants Demographics Stratified by Plasma FVIII:Ag Levels

Table 3. depicts the demographics of study participants stratified by serum FVIII:Ag levels. Participants within the 20-30 age group had the highest mean concentration of FVIII:Ag (137.554 ±41.688), followed by 41-50 age group (122.870±48.444), 31-40 age group (119.733±37.867) and the 51-60 age category had the least mean FVIII:Ag concentration. There was no statistical difference (P=0.243) in the mean FVIII:Ag levels among the various age categories. This implies age may have minor or limited influence on the FVIII levels of the participants.

The mean FVIII:Ag level was higher (129.394±46.531) among the male study subjects compared to their female counterparts (119.734 ± 30.789) even though the mean FVIII:Ag levels did not differ statistically (p=0.226) between the male and female genders. The mean FVIII:Ag level did not differ significantly between married and single participants.

Table 3. Participants' Demographics Stratified by Plasma Factor VIII levels

Variable Category Factor FVIII:Ag/ng/ml				***P-Value***
Age	20-30	137.554	± 41.688	*0.243*
	31-40	119.733	± 37.867	
	41-50	122.870	± 48.444	
	51-60	119.255	± 32.455	
Sex	Male	129.394	± 46.531	*0.226*
	Female	119.734	± 30.789	
Marital Status	Single	130.758	± 43.273	*0.336*
	Married	123.073	± 40.658	

Sex and Marital Status Compared using Students' T-test and Age Categories Compared using ANOVA. FVIII:Ag levels Presented as Mean ± SD.

Association between FVIII: Ag and Blood Groups

Table 4. illustrates the association between FVIII:Ag levels and blood group antigens. FVIII:Ag levels were highest among participants with blood group A (130.50 ±45.67), followed by blood group AB (129.02 ± 30.83), blood group B (125.87 ± 42.3) and individuals with blood group AB had the least mean concentration of FVIII:Ag. There was no significant statistical difference (p=o.714) in the mean concentrations of FVIII:Ag among the various ABO antigens.

Table 4. Association between Factor VIII: Ag and Blood Groups

Factor VIII: Ag							
Blood Groups	**Mean**		**95% Confidence Interval for Mean**		**Minimum**	**Maximum**	***p-value***
			Lower Bound	**Upper Bound**			
A(N_1=31)	130.50 ±	45.67	113.74	147.24	48.250	217.800	
B (N_2=29)	125.87±	42.38	109.76	142.00	51.350	217.350	*0.714^{NS}*
AB (N_3=25)	129.02±	30.83	116.30	141.74	71.000	193.600	
O (N_4=33)	119.15±	44.90	103.23	135.07	31.650	209.950	
Total(N=118)	125.87±	41.61	118.30	133.46	31.650	217.800	

Parametric data (presented in means ± standard deviation) were generated by One-way ANOVA.N: Total number of subjects; N1; number of participants with blood group A; N2; number of participants with blood group B; N: number of participants with blood group AB; N4: number of participants with blood group O. p-value<0.05 was deemed acceptable level of significance. NS: Not significant.

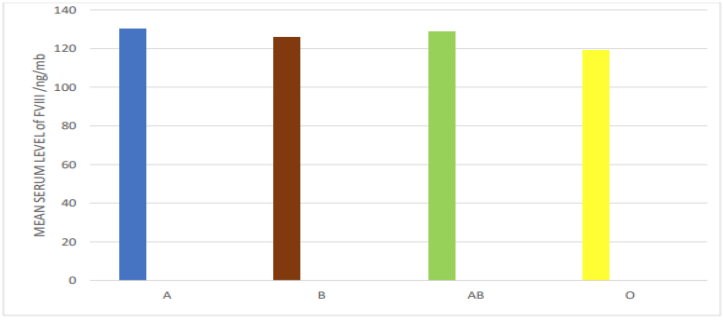

Figure 3. Shows the Graphical Representation of Mean FVIII:Ag Levels among Participants with the Various Blood Group Antigens

Figure 3. Mean FVIII:Ag concentrations of participants according to their ABO blood groups (N=118). Total number of participants; A: Blood group A; B: Blood group B; AB: Blood group AB; O`: Blood group O.

Participants Demographics Stratified by Plasma Factor VIII Levels

Table 5. shows the demographics of the study participants stratified by plasma FVIII:Ag levels. The mean plasma concentration of FVIII:Ag was higher in males (129.394±46.531) than in the female participants (119.734 ± 30.789). The mean FVIII:Ag levels did not differ significantly between the male and female study participants (p=0.226). The mean FVIII:Ag levels did not differ significantly between participants who were married and those who were not married (p=0.336).Though, the mean FVIII:Ag levels did not differ significantly among the various age groups (p=0.243), the levels were higher among participants within the 20-30 years age group (137.554±41.688), followed by the 41-50 years age group (122.870±48.444), 31-40 age group (119.733±37.867) and 51-60 years age group (119.255±32.455).

Table 5. Participants Demographics Stratified by Plasma Factor VIII levels

Variable Category Factor FVIII				***P-Value***
Age	20-30	137.554	± 41.688	*0.243*
	31-40	119.733	± 37.867	
	41-50	122.870	± 48.444	
	51-60	119.255	± 32.455	
Sex	Male	129.394	± 46.531	*0.226*
	Female	119.734	± 30.789	
Marital Status	Single	130.758	± 43.273	*0.336*
	Married	123.073	± 40.658	

Sex and Marital Status Compared using Students' T-test and Age Categories Compared using ANOVA.

FVIII:Ag Levels Presented as Mean ± Standard Deviation.

Association between FBC Parameters and the Blood Groups of Participants

Table 6 show the association between the ABO blood groups and FBC parameters of the study participants. The mean platelet volume (MPV) varied statistically (p=0.046) among the various ABO blood groups with group O individuals having the highest MPV.

Table 6. FBC vs Blood Groups of the Study Participants

Variables	**BLOOD GROUP**								
	A		**B**		**AB**		**O**		***p-value***
RBC/10*12/l	4.2	(4.0- 4.6)	4.6	(4.34.8)	4.3	(3.9 4.7)	4.5	(4.2 5.0)	*0.098*
HCT%	36.6	(32.9- 38.3)	37.8	(34.4 40.5)	35.7	(33.7 37.8)	38.9	(33.7 41.9)	*0.301*
HB/g/dl	12.3	(11.4- 13.5)	13.4	(11.8 14.1)	12.1	(11.5 12.8)	12.6	(11.5 14.3)	*0.451*
MCV.fl	84.8	(80.0- 88.6)	84.1	(79.7 86.5)	83.7	(81.4 87.5)	84.4	(77.4 88.7)	*0.964*
MCH/pg	29.1	(27.0-30.6)	29.3	(27.1 30.6)	28.7	(27.9 30.0)	28.8	(26.4 30.4)	*0.855*
MCHC/g/dl	34.67 ± 1.41 34.49 ± 1.17 34.02 ± 0.76 (34.16 ±1.38)								*0.165*
RDWCV%	13.8	(13.3 14.7)	13.7	(13.2 14.7)	13.7	(13.3 14.5)	14.3	(13.6 14.9)	*0.503*
RDWSD/	66.9	(62.1 70.0)	63.7	(59.1 69.4)	64.7	(61.1 68.9)	66.1	(41.5 70.7)	*0.901*
WBC10*9/l	4.8	(4.3 6.0)	5.3	(4.8 6.0)	6.1	(4.8 7.0)	4.9	(4.0 6.3)	*0.303*
LYM#	2.04 ± 0.64 2.08 ± 0.63 2.30 ± 0.86 2.09 ± 0.80								*0.638*
GRAN	2.3	(1.7 2.9)	2.7	(1.8 3.6)	2.8	(2.0 4.5)	2.3	(1.6 2.8)	*0.360*
MID	0.6	(0.4 0.7)	0.6	(0.4 0.8	0.6	(0.4 1.0)	0.5	(0.4 0.8)	*0.910*
LYM%	42.6	(26.1 52.3)	41.4	(30.4 50.0)	43.3	(27.4 47.7)	42.3	(31.1 52.0)	*0.938*
GRAN%	46.04 ± 15.12 49.03 ± 14.35 49.45 ± 12.62 46.34 ± 11.16								*0.724*
MID%	10.76 ± 3.51 11.13 ± 6.52 10. 30 ± 3.46 11.27 ± 5.0								*0.977*
PLT/1089/l	232.4 ± 68.96 231.3 ± 65.09 235.8 ± 67.61 234.4 ± 53.22								*0.917*
MPV/fl	8.12 ± 1.13 8.31 ± 1.01 8.23 ± 1.61 9.01 ±1.26								***0.046***
PDW/fl	11.1	(10.3 12.3)	11.5	(10.4 12.4)	10.9	(10.3 11.8)	11.9	(10.8 12.7)	*0.169*
PCT%	0.2	(0.1 0.2)	0.2	(0.2 0.2)	0.2	(0.1 0.2)	0.2	(0.2 0.3)	*0.389*
PLCR/%	15.74 ± 6.87 16.36 ± 5.96 16.13 ± 9.50 20.62 ± 7.55								*0.072*

Hb=Haemoglobin, HCT=Haematocrit, MCV=Mean Cell Volume MCH=Mean Corpuscular Haemoglobin,MCHC=Mean Corpuscular Haemoglobin Concentration, RDW-CV=Red Cell Distribution Width-Coefficient of Variation, WBC=White Blood Cell, MPV=Mean Platelet Volume. Parametric data (presented in means ± standard deviation) were generated by

One-Way ANOVA (posthoc analysis) and Non-Parametric data presented in medians (25th-75th percentiles) were generated by Kruskal-Wallis Test, and p<0.05 was considered statistically significant.

Plasma Levels of FVIII between Study Participants of "O" vs "Non-O" Blood Groups

Table 7. represents a comparison in the mean FVIII:Ag levels between "O" and non-"O" individuals. There was no statistical difference (P=0.276) in the mean serum concentrations of FVIII:Ag between "O" and "Non-O individuals, though individuals with the non-O blood group recording the highest mean serum levels of FVIII:Ag (128.48 ± 40.24) against their blood group O counterparts (119.15 ± 44.90).

Table 7. Plasma Levels of Factor VIII between Study Participants of "O" vs "Non-O" Blood Groups

Variable	Factor FVIII:Ag/ng/ml	*p-value*
Group O	119.15 ± 44.90	*0.276*^{NS}
Non-O Group	128.48 ±40.24	

Parametric data (presented in means ± standard deviation) were generated by Independent Sample T test.

NS: Not significant

Correlation between FBC and Serum FVIII Levels among the Study Participants

Table 8. Shows the correlation between FBC parameters and serum FVIII:Ag levels of the study participants. There was no statistical difference in the mean FVIII:Ag levels and the FBC parameters except the MPV. There was a weak negative correlation (r = -0.205 at p=0.039) between the MPV and the mean serum concentration of FVIII:Ag.

Table 8. Correlation between FBC and Plasma Factor VIII Levels among the Study Participants

Parameters	Correlation (r)	*p-value*
RBCX10^{12}/L	-0.32	0.748
HCT%	-0.19	0.847
HB g/dl	0.020	0.840
MCV, Fl	0.018	0.851
MCH, pg	0.012	0.903
MCHC, g/dl	-0.031	0.756
RDW-CV%	0.060	0.546
RDW-SD	0.096	0.330
WBC10*9/l	0.062	0.530
LYM#	-0.023	0.817
GRAN	0.063	0.526
MID	-0.085	0.387
LYM%	-0.003	0.976
GRAN%	-0.047	0.141
MID%	-0.143	0.141
PLT/1089/l	-0.093	0.338
MPV/fl	**-0.205**	**0.039**^{S}
PDW/fl	-0.115	0.247
PCT%	-0.169	0.088

PLCR/%	-0.182	0.066

Hb=Haemoglobin, HCT=Haematocrit, MCV=Mean Cell Volume MCH=Mean Corpuscular Haemoglobin, MCHC=Mean Corpuscular Haemoglobin Concentration, RDW-CV=Red Cell Distribution Width-Coefficient of Variation, WBC=White Blood Cell, MPV=Mean Platelet Volume. Parametric data were generated by Pearson correlation and Non-Parametric data presented using spearman correlation and p<0.05 was considered statistically significant;NS: significant.

Discussion

In our study, the distribution of ABO blood groups followed the sequence O > A > B > AB, with group O being the most prevalent (28.0%) among participants. This finding is consistent with reports from the Greater Accra region of Ghana, where blood group O was also predominant [8]. The high frequency of group O in our cohort aligns with the known predominance of group O in African populations. Additionally, an overwhelming majority (90.7%) of our participants were Rh(D) positive, consistent with other Ghanaian and African studies [5, 16, 9] confirming that Rh-positive phenotype is the norm in local and regional populations.

Despite the general agreement, some geographic variations were noted. For example, a study in the Ashanti region of Ghana reported a distribution of O > B > A > AB [9], while in Bangladesh, [5] found B > O > A > AB, and in Senegal, [16] reported A > O > B > AB. These discrepancies likely reflect ethnic and racial variation, population genetics, and migration patterns.

Regarding factor VIII antigen (FVIII:Ag) levels, we found no significant differences across age groups ($p = 0.243$), although the 20–30-year group had the highest levels. This aligns with [17], who reported weak or non-significant correlations between FVIII and age in non-severe hemophilia A patients. In contrast, [18] reported significantly higher FVIII levels with advancing age, although their study included children, which may explain the difference. We also found no significant sex differences in FVIII:Ag, supporting prior observations that baseline FVIII and von Willebrand factor (vWF) levels are generally similar between men and women.

We observed higher mean FVIII:Ag in blood group A, followed by AB, B, and O (A > AB > B > O), but these differences were not statistically significant. This pattern is consistent with the known influence of ABO blood groups on plasma vWF and FVIII levels. Individuals with blood group O have ~20–25% lower vWF (and FVIII) levels than non-O groups due to the absence of A/B glycosylation on vWF, which increases its clearance [19-21]. Our results align with studies by [22] and [17] , who also reported no significant ABO effects on FVIII. However, [5] and [23] reported significant ABO effects, with non-O groups (particularly B) showing higher FVIII levels. Notably, Song et al. observed racial differences, with ABO explaining ~15% of vWF variability and a smaller share of FVIII variability.

A novel finding in our study was the significantly higher mean platelet volume (MPV) in group O participants ($p = 0.046$). This association has not been widely reported, and its biological basis is unclear. ABO antigens can be adsorbed onto platelets, but whether they influence platelet size or production is unknown. One speculative explanation is that genetic factors near the ABO locus or linked to vWF may subtly affect platelet morphology. Further research is needed to explore this observation.

We also identified a weak but significant negative correlation between FVIII:Ag and MPV ($r = –0.205$, $p = 0.039$), suggesting a minor inverse relationship. It is possible that the lower FVIII/vWF levels in group O, combined with their higher MPV, contributed to this pattern, although causality cannot be inferred. Future studies with larger samples and mechanistic analyses are needed to clarify these associations.

Limitations of our study include the modest sample size, geographic concentration in Tema, and lack of vWF measurement. We also focused on adults aged 18–55, limiting generalizability to children or older adults. Nonetheless, our study contributes valuable data on ABO and Rh distribution and FVIII:Ag levels in a healthy Ghanaian population, highlights the potential influence of blood group on coagulation profiles, and identifies novel areas for further investigation

Conclusion

Based on the analysis of our data, we conclude that blood group O is the predominant ABO blood group (28.0%) among the study population, followed by blood groups A (26.3%), B (24.6%), and AB (21.2%). Nearly all participants were Rh-positive. Our findings did not show a significant influence of ABO blood group on FVIII:Ag levels, suggesting that, in this Ghanaian population, ABO type may not substantially contribute to thrombosis risk via FVIII elevation. Interestingly, participants with blood group O exhibited the highest mean platelet volume (MPV), indicating a possible link between ABO type and platelet size. Additionally, we observed a weak negative correlation between FVIII:Ag levels and MPV. Age and sex were not found to significantly influence FVIII:Ag levels in this cohort.

Recommendations

We recommend further studies including individuals of all age groups and ethnic backgrounds across Ghana to better understand the distribution of ABO blood groups and their relationship with coagulation factors. Additionally, comprehensive assessment of the entire hemostatic system including von Willebrand factor, fibrinogen, and other clotting parameters would provide a more complete picture of hemostasis and thrombosis risk in the Ghanaian population.

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