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Evaluation of Alanine Aminotransferase (Alt), Aspatate Aminotransferase (Ast) and Albumin (Alb) Among Blood Donors Infected with Hepatitis B and C Virus and Malaria in Ife Central Local Government Area, Ile Ife, Osun State, Nigeria

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Abstract

Liver diseases are responsible for over one and half million deaths annually and are characterized by permanent inflammatory processes that predispose to liver cancer.Liver function biomarkers are important indices that help in assessment of disease severity. Several studies reveal changes in activity level of liver enzymes and protein in the serum due to Plasmodium infection and Hepatitis infection. Liver enzymes play an important role in the assessment of liver function because of liver injury resulting in cytolysis or necrosis that causes release of enzymes into circulation. Infection with hepatitis B virus (HBV) and hepatitis C virus (HCV) are major global health problems. Moreover, infection with these viruses might associate with increased mortality rate as the infection may predisposes to the development of serious liver diseases such as liver cirrhosis, liver failure and hepatocellular carcinoma (HCC).

The objectives of the study are to determine the prevalence Hepatitis B and C infections among blood donors, analyze the relationship between socio- demographic variables and Alanine aminotransferase (ALT), Aspatate aminotransferase (AST) and Albumin (ALB), analyze the relationship between malarial and ALT and AST and evaluate the effect of hepatitis infections on the liver cells. The study was conducted in Ife Central Local Government .Area, Ile Ife, Osun State.

Five (5) ml of venous blood was obtained from each of 400 blood donors into plain bottles and labeled accordingly. Sera were separated from aliquots of the blood and screened for hepatitis-B and C surface antigens (HBsAg and HCV), and enzymes such as aspatate aminotransferase (AST) and alanine aminotransferase (ALT). The total percentage of elevated AST was 14(3.5%), ALT 15 (3.8%) and ALB 32(8.0%), while that the least AST 24 (6.0%), ALT 23 (4.8%) and ALB 6 (1.5%). There was significant difference between Occupation and ALT (p= 0.040) and ALB (p= 0.030), Marital status and AST (p=0.014), ALT (p= 0.012), ALB (p=0.014), there was no significant difference between HCV and AST (p=0.532), ALT (p=0.532), but with ALB (p=0.000). There was no significant difference between HBV and AST (p=0.285), ALT (p=0.593) and ALB (p=0.033), the general hepatitis viral infection had no significant difference with AST (p=0.516), ALT (p=0.516), but with ALB (p= 0.000), There was no

significant difference between malaria infection and AST (p= 0.906), ALT (p= 0.999) and ALB (p= 0.718). in conclusion, although the prevalence hepatitis B and C viral infections was low and there was no significant relationship between the Alanine aminotransferase (ALT), Aspatate aminotransferase,(AST) and Hepatitis infection in the local government, critical screening of blood donors is of prime importance because they serve as an asymptomatic reservoirs and a potential source of transmission of these infections. The strengthening of creating awareness on the general public regarding HBsAg and HCV transmission and prevention should be of paramount important.

Keywords: Evaluation; Alanine Aminotransferase; Aspartate Aminotransferase; Albumin; Blood Donors; Hepatitis B and C Virus; Malaria; Ile Ife

Abbreviations: ALB: Albumin; AST: Aspatate Aminotransferase; ALT: Alanine Aminotransferase; ALP: Alkaline Phosphatase; HBV: Hepatitis B Virus; HCV: Hepatitis C Virus.

Introduction

Liver diseases are responsible for over one and half million deaths annually and are characterized by permanent inflammatory processes that predispose to liver cancer. The liver is, in many ways, the reflection of a person's health and should play a central role in worldwide public health policies [1]. Worldwide, annually HBV and HCV related liver diseases kill 1-2 million people [2]. Viral hepatitis caused by HBV and HCV account for a substantial proportion of chronic liver diseases worldwide leading to cirrhosis, hepatocellular carcinoma, liver failure, and eventually death [3]. Different serological markers of diverse clinical and epidemiological importance are presented once infected with HBV. Depending on the stage and natural history of the disease, these serological markers can occur individually or in different combinations [4]. Biomarkers are equally useful in the evaluation and assessment of hepatic function and disease severity because HBV infection may alter the serum levels of certain hepatic enzymes and compounds such as alkaline phosphatase (ALP), asphatate aminotransferase (AST), alanine aminotransferase (ALT), bilirubin, and albumin [5]. AST and ALT are often released into the bloodstream once there is hepatocellular damage, so ALT serum level elevation correlate more with hepatic injury. Sometimes the ratio of ALT to AST can also help define the patterns of a disease [6]. The elevation of these enzymes and proteins above their upper reference limits are said to be abnormal except for serum albumin, which usually falls below its reference limit when it is abnormal. Reference ranges for the same enzymes and tests differ among laboratories and geographical locations [7]. As hepatic disease becomes severe, aminotransferases are usually elevated but may not correlate well with the disease. However, as the disease progresses, the serum level of albumin, bilirubin, and prothrombin time usually become altered, while reduction in platelet counts is usually an unreliable prognostic sign. Marked elevation in serum ALT with acute flare-up may be seen in patients with chronic hepatitis [8].

Materials and Methods

Ethical Consideration

Prior to the commencement of the study, the research protocol was submitted and approved by the Ministry of Health Osun State. Nigeria. Written informed consents were obtained from all blood donors and confidentiality was assured by using codes.

Study Area

The study was conducted in Ife Central Local Government Area, Ile Ife, Osun State. The State is situated in the tropical rain forest zone. It covers an area of approximately 14,875 sq km and lies between latitude 7° 30′ 0″ N and longitude 4° 30′ 0″ E. Though a landlocked state, it is blessed with presence of many rivers and streams which serves the water needs of the state. Majority of the inhabitants are skilled workers, e.g. civil servants and artisans while others are unskilled workers, e.g. peasant farmers, traders and transport workers.

Study Population

The study populations comprise of blood donors who came to donate blood at the government approved blood donor's centers within the local government area. They were approached and the purpose of the study was discussed with them. Thereafter, the procedure to be taken was explained to them. The donors were informed that only those that signed the consent form will be allowed to participate in the study. They were also informed that participation is voluntary.

Study Design

The study was conducted between March 2021 and September 2021. A total of 400 blood samples were collected

and prior to the collection of the blood samples structured questionnaire designed to collect basic demographic information including age, residential location, occupation and educational level and other information as regards the study.

Sample Size

A total of 400 blood samples were collected after ethical clearance and verbal consent were obtained from the donors.

Exclusive Criteria: Donors with symptoms of malaria and or on Malaria drug were not included in the study.

Inclusive Criteria: Donors without symptoms of malaria, not on drug, not positive to hepatitis B and C viruses were included in the study.

Sample Collection and Processing

Five (5) ml of venous blood was obtained from 400 blood donors into plain bottles and labeled accordingly. Sera were separated from aliquots of the blood and screened for hepatitis-B and C surface antigens (HBsAg and HCV), and enzymes such as aspartate aminotransferase (AST) and alanine aminotransferase (ALT).

Screening for Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV)

Test to screen the 400 blood samples for HBV and HCV was done based on the detection of hepatitis B surface antigen (HBsAg) and hepatitis-C surface antigen (Anti-HCV) using rapid immunochromatographic (IC) tests which are in cassette form. The SMI One Step HBsAg and anti-HCV Test Devices (Serum/Plasma) is a qualitative, lateral flow immunoassay for the detection of HBV and HCV in plasma.

Estimation of Alanine Aminotransferase (ALT) and Aspartate Aminotransferase (AST)

Thirty eight (38) Hepatitis (b and c) positive sera from 400 blood donors were used in the estimation of AST and ALT as follows:

A. Method

Three or more tubes (depending on the number of tests) were taken and label as follows:
B – Reagent blank, S – Standard (pyruvate 57 ALT IU/l), 1, 2, etc – Animals' tests

B. The Reagents are:

Reagent 1= Substrate PH 7.4, Reagent 2= DNPH Colour reagent, Reagent 3 = Sodium hydroxide (4mol/L), Reagent 4 = working pyruvate standard 0.25l of Reagent 1 was Pipetted into samples' tubes (1, 2, etc). The tubes were transferred into water bath set at 37°C, 0.05 ml (50 _l) of animal's serum was added after 5 minutes, Mixed and incubate at 37°C for exactly 30 minutes. The timing started after adding serum to the first tube., Just before 30 minutes is due, the followings were pipetted into the blank and standard tubes: B ..0.1 ml distilled water, 0.5 ml Reagent 1 , S .. 0.1 ml distilled water, 0.4 ml Reagent 1, 0.1 ml Reagent 4. At exactly 30 minutes, tubes 1, 2, etc were removed from the water bath and placed in the rack with tubes B and S**.,** 0.25 ml Reagent 2 was immediately added to each tube and mix well and left at room temperature (20–28°C) for 20 minutes., 2.5 ml of Solution 1 was added to each tube and mix well and also left at room temperature for 10 minutes., The absorbance of the standard, and test samples were read in a spectrophotometer set at wavelength 505 nm. The instrument was zero with the reagent blank solution in tube B. The colours of the solutions are stable for up to 1 hour. The ALT activity in IU/l in the test samples was read from the calibration graph, making sure that the reading of the standard which corresponds to ALT 57 IU/l agrees with the calibration curve [9].

C. Determination of Blood Group of the Donors

Determination of the blood groups of the donors was done using Anti sera A, B, AB and anti D that determine the Rhesus factor as follows:

A glass slide was marked as follows Anti-A, Anti-B, Anti D and each division was pipette into as follows: Anti-A: 1 volume anti-A serum, 1 volume donor's capillary blood, Anti-B: 1 volume anti-B serum, 1 volume donor's capillary blood, Anti-AB: 1 volume anti-AB serum, 1 volume donor's capillary blood, Anti-D: 1 volume anti-D serum, 1 volume donor's capillary blood. The contents of each division were mixed using a clean piece of stick for each. The slide was tilted from side to side, looking for agglutination and the results recorded after 2 minutes

Data Analysis

Analysis of the data was done using appropriate Statistical Package for the Social Sciences tool version 21.0. The prevalence was calculated as the number of serologically positive samples divided by the total number of samples tested. The Chi-square test was used to determine associations between positivity and socio demographic factors. The strength of the associations was assessed by odds ratios and 95% confidence intervals (CI) were calculated.

Results

In Table 1, the total percentage of elevated AST was 14(3.5%), ALT 15 (3.8%) and ALB 32(8.0%), while the

non elevated AST was 24 (6.0%), ALT 23 (4.8%) and ALB 6 (1.5%). The percentage elevated AST (6.3%) was recorded in aged 27-35 years, followed by 1.9% in aged 36-44 years and the least (1.6%) in aged 45-53 years, while that of ALT was 9.1% in aged 18-26 years followed by (5.6%) in aged 27-35 years and the least (1.6%) in aged 45-53 years. The percentage elevated ALB (18.2%) was recorded in aged 18-26 years followed by (11.9%) in aged 27-35 years and the least (3.8%) in aged 36-44 years.

Age (Years)	No Examined	No Infected	AST		ALT		ALB	
			0-12	> 12	0-12	>12	< 35	>35
18-26	11	**2(18.2)**	2 (18.2)	0 (0.0)	1(9.1)	**1(9.1)**	0 (0.0)	**2 (18.2)**
27- 35	160	22(13.8)	12 (7.5)	10(6.3)	13(8.1)	9(5.6)	3 (1.9)	19(11.9)
36-44	156	8(5.1)	5(3.2)	3 (1.9)	4 (2.6)	4 (2.6)	2(1.3)	6 (3.8)
45-53	63	6(9.5)	5 (7.9)	1 (1.6)	5 (7.9)	1 (1.6)	1(1.6)	5 (7.9)
54-62	10	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Total	**400**	**38(9.5)**	**24 (6.0)**	**14 (3.5)**	**23 (4.8)**	**15(3.8)**	6 (1.5)	32 (8.0)

Normal range: AST and ALT= (0-12), ALB= (0-35).

Table 1: The Distribution of AST, ALT and ALB of the Hepatitis According to Age Among Positive Blood Donors in Ife Central L.G. A in Osun State (N=400).

In Table 2 in occupation, the percentage elevated AST 8.2% was recorded in student followed by 2.7% in trader and the non elevated of 1.4% recorded in civil servant while that of ALT was 10.2% in student followed by 6.8% in trader and the least 3.8% in artisan. The percentage elevated ALB (18.4%) was recorded in student followed by (10.6%) in artisan and the least (5.3%) in farmer. There was significant difference between Occupation and ALT (p= 0.040), and ALB (p= 0.030).

Occupation	No Exam	No Infected	AST(%)		ALT(%)		ALB (%)	
		(%)	0-12	> 12	0-12	> 12	< 35	>35
Artisan	132	15(11.4)	8(6.1)	7(5.3)	10(7.6)	5(3.8)	1 (0.8)	14(10.6)
Civil servant	73	4(5.5)	3(4.1)	1(1.4)	4(5.5)	0(0.0)	0 (0.0)	4(5.5)
Trader	73	7(9.6)	5(6.8)	2(2.7)	2(2.7)	5(6.8)	3(4.1)	4 (5.5)
Driver	54	1 (1.9)	1(1.9)	0(0.0)	1(1.9)	0(0.0)	1(1.9)	0 (0.0)
Student	49	10 (20.4)	6(12.2)	**4(8.2)**	5(10.2)	**5(10.2)**	1 (2.0)	**9(18.4)**
Farmer	19	1 (5.3)	1(5.3)	0(0.0)	1(5.3)	0 (0.0)	0(0.0)	1(5.3)
Total	**400**	**38(9.5)**	**24(6.0)**	**14(3.5)**	**23(5.8)**	**15(3.8)**	**6 (1.5)**	32 (8.0)

ALT (X2)= 19.051, p= 0.040, ALB (X2)= 19.893, p= 0.030.

Table 2: The Distribution of AST, ALT and ALB of the Hepatitis According to Occupation Among Positive Blood Donors in Ife Central L.G. A in Osun State (N=400).

In sex, the percentage elevated AST (3.7%), ALT (3.9%) and ALB (8.1%) was recorded in male. In marital status, the percentage elevated AST (5.2%), ALT (5.2%) and ALB (12.3%) was recorded in among single. There was significant difference between marital status and AST (**p= 0.014)** ALT **(p= 0.012**), and ALB (**p= 0.014**).

Sex	No Exam	No Infected	AST		ALT		ALB	
			0-12	>12	0-12	>12	< 35	>35
Male	382	37(97.4)	23(6.0)	**14(3.7)**	22(5.6)	**15(3.9)**	6(1.6)	**31(8.1)**
Female	18	1(2.6)	1(5.6)	0(0.0)	1(5.6)	0(0.0)	0 (0.0)	1(5.6)
Total	**400**	**38(9.5)**	**24 (6.0)**	**14 (3.5)**	**23 (5.8)**	15(3.8)	6 (1.5)	32 (8.0)

Table 3: The Distribution of AST, ALT and ALB of the Hepatitis According to Sex Among Positive Blood Donors in Ife Central L.G. A in Osun State (N=400).

In marital status, the percentage elevated AST (5.2 %), ALT (5.2%) and ALB (12.3.1%) was recorded among single, while non elevated AST (9.7%), ALT (9.7%) and ALB (2.6%).

Marital Status	No Examined	No Infected	AST		ALT		ALB	
			0-12	>12	0-12	>12	< 35	>35
Married	245	15(39.5)	9 (3.7)	6 (2.4)	8(3.3)	7(2.9)	2 (0.8)	13(5.3)
Single	15	23(60.5)	15(9.7)	**8(5.2)**	15(9.7)	**8(5.2)**	4(2.6)	**19(12.3)**
Total	**400**	**38(9.5)**	**24 (6.0)**	14 (3.5)	23 (5.8)	15(3.8)	6 (1.5)	32 (8.0)

AST (X2)= 8.496, p= 0.014, ALT (X2)= 8.930, p= 0.012, ALB (X2)= 8.502, p= 0.014

Table 4: The Distribution of AST, ALT And ALB of the Hepatitis According to Marital Status Among Positive Blood Donors in Ife Central L.G. A in Osun State (N=400).

In education, the percentage elevated AST (11.1%) was recorded in primary followed by (3.2%) in tertiary and the least (2.8%) in secondary while that of ALT was (11.1%) in primary followed by 3.6% in secondary and the least (2.4%) in tertiary. The percentage elevated ALB (11.1%) was recorded in primary followed by (9.6%) in tertiary and the least (6.9%) in secondary.

There was no significant difference between HCV and AST (p=0.532), ALT (p=0.532), but with ALB (p=0.000). There was no significant difference between HBV and AST (p=0.285), ALT (p=0.593) and ALB (p=0.033), the general hepatitis virus infection had no significant difference with AST (p=0.516), ALT (p=0.516), but with ALB (p= 0.000) (Tables 4a-4c).

	AST		ALT		ALB	
	0-12	> 12	0-12	>12	<35	>35
Observed N	13	10	13	10	2	21
Expected N	11.5	11.5	11.5	11.5	11.5	11.5
Residual	1.5	-1.5	1.5	-1.5	-9.5	9.5

AST X^2 = 0.391, p=0.532, ALT X^2 = 0.391, p=0.532, ALB (X^2),= 20.632, **p= 0.000**

Table 4a: Relationship between HCV and AST, ALT, ALB.

	AST		ALT		ALB	
	0-12	> 12	0-12	>12	<35	>35
Observed N	9	2	8	6	3	11
Expected N	7	7	7	7	7	7
Residual	20	-2	1	-1	-4	4

AST X^2 = 1.143, p=0.285, ALT X^2 = 0.286, p=0.593, ALB (X^2),= 4.571**, p= 0.033**

Table 4b: Relationship between HBV and AST, ALT, ALB.

	AST		ALT		ALB	
	0-12	> 12	0-12	>12	<35	>35
Observed N	21	17	21	17	5	33
Expected N	19	19	19	19	19	19
Residual	2	-2	2	-2	-14	-14

AST X^2 = 0.421, p=0.516, ALT X^2 = 0.421, p=0.516, ALB (X^2),= 20.632, **p= 0.000**

Table 4c: Relationship between General Hepatitis infection and AST, ALT, ALB.

Education Status	No Examined	No Infected	AST		ALT		ALB	
			0-12	> 12	0-12	>12	< 35	>35
Primary	27	3(7.9)	0 (0.0)	**3 (11.1)**	0(0.0)	**3(11.1)**	0 (0.0)	**3 (11.1)**
Secondary	248	23(60.5)	**16(6.5)**	7(2.8)	14(5.6)	9 (3.6)	**6(2.4)**	17(6.9)
Tertiary	125	12(31.6)	8(6.4)	4(3.2)	**9(7.2)**	3(2.4)	0(0.0)	12(9.6)
Total	**400**	**38(9.5)**	**24 (6.0)**	**14 (3.5)**	**23 (5.8)**	**15(3.8)**	**6 (1.5)**	**32 (8.0)**

Table 5: The Distribution of Ast, Alt And Alb of the Hepatitis According to Marital Education Status Among Positive Blood Donors in Ife Central L.G. A in Osun State (N=400).

Table 6, In blood group, The total elevated AST (3.5%), ALT (3.8%) and ALB (8.0%) was recorded in this study. the percentage elevated AST (5.6%) was recorded in B+ve followed by (5.1%) in A+ve and the least (3.0%) in O+ve while that of ALT was (6.8%) in A+ve followed by (4.2%) in B+ve and the least (3.4%) in O+ve. The percentage elevated ALB (13.9%) was recorded in B+ve followed by (10.2%) in A+ve and the least (3.6%) in O-ve.

Blood Group	No Examined (%)	No infected	AST		ALT		ALB	
			0-12	> 12	0-12	> 12	< 35	>35
Ab +ve	1	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0 (0.0)
A -ve	5	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0 (0.0)	0(0.0)
A +ve	59	7(11.9)	4(6.8)	3(5.1)	3(5.1)	4 (6.8)	1(1.7)	6 (10.2)
B -ve	1	0 (0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0 (0.0)
B +ve	72	10 (13.9)	6(8.3)	4(5.6)	7(9.7)	3 (4.2)	0 (0.0)	10(13.9)
O -ve	28	2 (7.1)	2(7.1)	0(0.0)	2(7.1)	0 (0.0)	1(3.6)	1(3.6)
O +ve	234	19(8.1)	12(5.1)	7(3.0)	11(4.7)	8(3.4)	4(1.7)	16(6.4)
Total	**400**	**38(9.5)**	**24 (6.0)**	**14 (3.5)**	**23 (5.8)**	**15(3.8)**	**6 (1.5)**	**32 (8.0)**

Table 6: The Distribution of Ast, Alt and Alb Of The Positive Blood Donors According to Blood Group in Ife Central L.G. A in Osun State (N=400).

There was no significant difference between malaria and AST (p= 0.906), malaria and ALT (p= 0.999) and malaria and ALB (p= 0.718).

ANOVA

	Sum of Squares	df	Mean square	F	sig
Malaria count*AST Between Groups	841162.157	2	420581.078	0.099	0.906
Within Groups	1.69E+09	397	4268108.468		
Total	1.70E+09	399			
Malaria count*ALT Between Groups	119077.53	2	5953.765	0.001	0.999
Within Groups	2.90E+08	397	4270197.271		
Total	2.97E+08	399			
Malaria count*ALB Between Groups	2822430.139	2	141215.069	0.331	0.718
Within Groups	2.87E+08	397	4263117.869		
Total	2.97E+08	399			

Table 7: Relationship between Malaria parasite count and AST, ALT ALB.

Discussion and Conclusion

Liver function biomarkers are important indices that help in assessment of disease severity. Several studies reveal changes in activity level of liver enzymes and protein in the serum due to Plasmodium infection and Hepatitis infection. Liver enzymes play an important role in the assessment of liver function because of liver injury resulting in cytolysis or necrosis that causes release of enzymes into circulation. They are crucial in differentiating hepatocellular (functional) from obstructive (mechanical) liver disease. In this study, the total percentage of elevated AST was 14(3.5%), ALT 15 (3.8%) and ALB 32(8.0%), which was more lesser than what Umid, et al. [10] reported among patients having HBV and HCV, where the values of AS T for HBV was 75.9 U/L and HCV was 54.3 U/L and ALT for HBV was 54.6 U/L and HCV was 55.5 U/L respectively. Although, Kesete Y, et al. [11] observed in Patients Suspected of Liver Diseases in Asmara of having an elevation in mean values ALT and AST, also, abnormal ALT and AST was observed among HBsAg and HBeAg-seropositive groups in a study conducted by Koki, et al. [12] which shows the activity of liver enzymes among HBV-positive patients where elevated ALT and AST was recorded among HBV. In the work done by Taura, et al. [13] on the analysis of the liver enzyme activity in 200 HBsAg-seropositive patients, 17.0% were seropositive for HBeAg with elevated serum level of ALT and 44.8% of the HBeAg-infected subjects had ongoing liver damage, with 5% linked to HCC. But Olatunji, et al. [14] reported that of the HBsAg seropositives subjects, 72.7% showed abnormal levels of AST and none showed abnormal levels of ALT. The elevated levels of liver enzymes in HBV and HCV in seropositive donors may be connected with the effect of HBV and HCV on the hepatocytes, although these enzymes (AST, ALT and ALB) were not specific for liver pathology except for ALT which higher levels in the bloodstream can be a sign of liver trouble.

According to Age, the high percentage elevated AST (6.3%) was recorded in aged 27-35 years, while that of ALT was (9.1%) in aged 18-26 years. The high percentage elevated ALB (18.2%) was recorded in aged 18-26 years,.but Toyosi et al., 2021, in the study on the Age,Gender Pattern and Liver Function Markers in Hepatitis B and C Seropositive Participants Attending a Health Facility in Yaba-Lagos reported that aged 20-40years had 19.36% AST and 21.87% ALT while 16.56% AST and 18.05% ALT was recorded in 41-60years and 24.76% AST and 19.08% ALT was recorded among aged above 60years. In sex, the percentage elevated AST (3.7%), ALT (3.9%) and ALB (8.1%) was recorded in male this is in agreement with Toyosi, et al. [15] who reported that the elevated AST (19.15%) and ALT (21.79%) was also recorded among male. In marital status, the high percentage elevated AST (5.2%), ALT (5.2%) and ALB (12.3%) was recorded among single. Whereas, In occupation, the high percentage elevated AST (8.2%), ALT (10.2%) and ALB (18.4%) was recorded among student in the study.

In education, high percentage elevated (11.1%) was recorded in primary each for AST, ALT and ALB in the study and among the blood group, the high percentage elevated AST 5.6% and ALB (13.9%) was recorded among B+ve donors while that of ALT was 6.8% among A+ve donors.

According to this study, there was no significant difference between malaria and AST (p= 0.906), ALT (p= 0.999) and ALB (p= 0.718) also, there was no significant difference between HCV and AST (p=0.532), ALT (p=0.532), but with ALB (p=0.000).There was no significant difference between HBV and AST (p=0.285), ALT (p=0.593) and ALB (p=0.033), the general hepatitis virus infection had no significant difference with AST (p=0.516), ALT (p=0.516), but with ALB (p= 0.000).

In conclusion, although the prevalence hepatitis B and C viral infection was low and there is no significant relationship between the (ALT), (AST) and Hepatitis infection and between Malaria infection in the local government, critical screening of blood donors is of prime importance because they serve as an asymptomatic reservoirs and a potential source of transmission of these infections. The strengthening of creating awareness on the general public regarding HBV and HCV transmission and prevention and volunteer donation of blood should be considered rather than using commercial blood donors. should is suggested.

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