

Hepatitis C Virus Infection in Blood Donors: An Emerging Risk to Transfusion Services

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Abstract

Background: Hepatitis C infection is transmissible via transfusion of blood and blood products. Little work exists in local literature on its prevalence.

Methods: A prospective study aimed at documenting the sero-prevalence of hepatitis C virus infection in blood donors in a tropical environment.

Results: A total of four thousand six hundred and thirty three regular blood donors were screened over a 3 year period. Age of donors ranged between 19 and 42 years with a mean of 33 years. Two hundred and forty one donors (5.2%) were seropositive. Age-specific prevalence rates ranged from 0.09% to 1.7%. Yearly prevalence rates ranged from 3.4% to 6.9%.

Conclusions: This study shows that the prevalence of HCV infections in our blood donors is high and requires active and sensitive screening in order to improve the safety of banked blood.

Key words: Hepatitis C, regular blood donors

Résumé

Introduction: Sanguine et produits du sang, il y a un très peu de documents dans la littérature locale sur sa fréquence.

Méthodes: Une étude prospective qui vise à documenter la séro-fréquence d'infection du Virus C hépatite dans le sang des donneurs dans un milieu tropique.

Résultats: Un nombre total de quatre mille six cents trente trois donneurs réguliers ont fait le test de dépistage au cours d'une période de 3 ans. Les donneurs avaient la tranche d'âge d'entre 19 et 42 ans avec un moyen de 33 ans. Deux cents et quarante et un donneurs (5,2%) étaient séropositifs. La tranche du taux d'âge spécifique de la fréquence entre 0,09% et 1,7%. Taux annuel de la fréquence entre 3,4% et 6,9%.

Conclusion: Cette étude montre que la fréquence des infections du VCH dans le sang de nos donneurs est élevée et demande un dépistage actif et sensitif afin d'améliorer le sans danger des sangs dans la banque du sang.

Mot clés: Hépatite C, donneurs réguliers du sang

Introduction

Hepatitis C is emerging as an important transfusion transmissible infection that is associated with chronic liver disease such as cirrhosis and hepatocellular carcinoma.^{1, 2} Blood transfusion is an important modality in the management of several medical and surgical conditions whereby many lives are saved daily by the administration of blood.

HIV and Hepatitis B virus had long been known to be transmissible via blood transfusion which led to the institution of screening measures to reduce the

hazards of blood transmission. Hepatitis C has been shown to be transmissible through other routes.³

Globally it is estimated that there are about 170 million chronic carriers of hepatitis C virus with about 3% of the world's population infected with the virus.⁴ The prevalence of hepatitis C virus infection varies widely across regions ranging from as low as 1% reported in Nigeria to as high as 20%-30% in some rural communities of Egypt.^{5,6}

As at present there is no vaccine for the prevention of infection with hepatitis C virus. The only feasible strategy for the control of the infection in the

community is by keeping exposure to blood to a minimum⁷.

Institution of effective screening procedures will greatly reduce the risk of transmission via blood and blood products as adequate treatment is not currently readily available.⁸

This study was aimed at establishing the prevalence of hepatitis C virus infection in our institutions' main blood donation unit which serves both the hospital and the community.

Materials and Methods

The study was carried out at the blood donor bay of the department of Hematology and Blood Transfusion Ahmadu Bello University Teaching Hospital, Zaria (ABUTH), Nigeria from June 2000 – June 2002.

The subjects were the regular blood donors to the Blood Transfusion unit of the hospital. Blood donors in this study comprised of voluntary donors, patient replacement donors and spouses of antenatal clinic attendees. All subjects for blood Transfusion satisfied the routine minimum donation criteria.

Five milliliters of venous blood was collected into an EDTA bottle and thoroughly mixed. The hepatitis C sero status of the donors was determined within 2 hours of collection. For the detection of hepatitis C

virus infection, Clinotec Diagnostic test kits were used. The test is an immunochromatographic test designed for qualitative determination of antibodies to hepatitis C virus. It is a third generation method using direct binding principle with sandwich antigen. It has a sensitivity of 99.5% and a specificity of 99.7% based on information of the manufacturer.

Results

During the period a total 4633 regular blood donors between the ages of 19 and 42 years were screened for hepatitis C antigen. This comprised of 4588 (99%) males and 45(1%) females. Two thousand one hundred and sixty two (46.67%) were voluntary donors, 918 (19.81%) were replacement donors while 1503 (32.44%) were relations/husbands of antenatal clinic attendees. Two hundred and forty one (5.2%) were positive for hepatitis C virus. There were 236 (5.1%) males and 5 (0.1%) females.

Table 1 shows the age-specific prevalence rates of the subjects which ranged from 0.09 % in the age group ≥ 40 years to 1.7% in the age group 20-24 years. Table 2 shows the yearly distribution and year specific prevalence rates: the lowest prevalence rate was in 2000(3.4%) while the highest prevalence rate was in 2001(6.9%).

Table 1: Age –specific prevalence rate of Hepatitis C virus in blood donors at Ahmadu Bello University Teaching Hospital

Age (years)	No. screened	No. positive	% positivity
15 – 19	530	24	4.5
20 – 24	914	77	8.9
25 – 29	1350	66	4.9
30 – 34	1152	38	3.3
35 – 39	612	32	5.2
≥ 40	75	4	5.3
Total	4633	241	5.2

Table 2: Yearly distribution of donors screened for Hepatitis C virus in Ahmadu Bello University Teaching Hospital (2000-2002)

Year	No. screened	No. positive	% positivity
2000	1615	56	3.4
2001	1482	102	6.9
2002	1536	83	5.4
Total	4633	241	5.2

Discussion

The prevalence rates of hepatitis C virus infection in this report was 3.4% - 6.9% (mean 5.2%). The results of this study have clearly highlighted the fact that hepatitis C virus infection is common in our donor population. The study showed that more than 99% of the donors are males. This is because males are more culturally more prominent in the environment.

This study was able to establish the presence of hepatitis C virus infection in all age groups of the donors with more than 75% of the infection occurring in the productive age groups 20-34 years. The highest prevalence rate occurred in the age group 20-24 years. The productive age group in the community is relied upon for regular blood supply. The effect of these is a decrease in the available young males for blood donation.

The 5.2% mean prevalence rate obtained in this study is much higher than the 1% earlier obtained in our sister hospital in Kaduna in 1998 using the same methodology,⁵ but similar to 6% obtained in Jos in the same north central Nigeria.⁹ In Egypt, the prevalence rate ranged between 20% to 30%⁶ while among the urban black blood donors in south Africa, it was 1.2%, much less than the finding in this report but higher than the 0.36% obtained in volunteer blood donors in the United States.^{10,11} Across Europe hepatitis C virus prevalence rates are generally low ranging from 0.13% in German blood donors to 0.68% in French blood donors.^{12,13}

Increasing prevalence of hepatitis C virus infections in our donor population in addition to the burden of HIV and Hepatitis B virus infection further depletes safe blood supply. Even though screening of blood reduces the possibility of transfusion of transmissible infections, screening tests that are highly sensitive should be employed to ensure safe blood pool for transfusion. It is hoped that the data generated will assist in reinforcing the hospitals screening policy.

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