Original Article

FREQUENCY OF HEPATITIS-C VIRUS ANTIBODIES IN BLOOD DONORS IN COMBINED MILITARY HOSPITAL, QUETTA

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ABSTRACT:

Objective: To assess the frequency of anti-HCV antibodies in blood donors at Combined Military Hospital, Quetta with vigilant donor selection.

Design: This is a prospective study to assess the frequency of anti-HCV antibodies while following donor selection criteria vigilantly, keeping in view that high-risk groups likely to be positive for anti-HCV antibodies are excluded on the basis of initial interview. All donors were subjected to initial interview by a hematologist. Blood samples were tested with 3rd generation ELISA test for anti-HCV reactivity.

Settings: All voluntary blood donors reporting to blood bank CMH, Quetta from 1st January 2000 to 31st January 2001 have been included in the study.

Main outcome: Determination of frequency of anti-HCV antibodies in well-selected blood donors.

Results: A total of 1635 blood donors were interviewed. All donors were male having age between 18-48 years. 135 donors (8.26%) were rejected or deferred. Of these 60(3.7%) were deferred due to recent history of jaundice; other causes of deferral or rejection were surgery (1.04%), tattooing or body piercing (0.92%), injury including road side accidents (1.9%), drug abuse (0.49%) and history of past transfusion (0.24%). 1500 donors were bled and tested. 200 of these donors were repeat donors and 1300 first time donors. 24 of the first time donors (1.85%) tested positive for anti-HCV, while 4(2%) of the repeat donors also tested positive. The overall frequency was found to be 28 (1.87%).

Conclusion: Healthy donor selection is of paramount importance in blood banking. Vigilant donor selection, with a preference for younger donors decreases frequency of anti-HCV positivity. Further studies are needed to support this observation.

KEY WORDS: Anti-HCV, blood donors, Quetta.

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INTRODUCTION

Hepatitis C virus (HCV) belongs to flaviviridae family. It is a lipid enveloped RNA virus of approximately 10,000 nucleotides. It spreads through contaminated needle sticks, haemodialysis procedures, transfusion of blood or blood products, body piercing, sexual intercourse and through peri-natal transmission[1,2]. About 85% HCV infected individuals become chronically infected out of which 10-20% develop cirrhosis of liver. About 7% of cirrhotic patients develop hepatocellular carcinoma[3].

Although, internationally anti-HCV blood testing either through surrogate markers or currently available highly sensitive PCR tests

have been employed since long, Pakistan has lagged behind and only recently anti-HCV testing has become a routine practice. Seroprevalence in Pakistan has been reported from 0.7% - 20%[4,5,6]. Besides, the method used for screening, various demographic and social factors like age, sex, repeat donors, professional donors, educational status, high risk group, socioeconomic conditions and prevalence in general population effect the outcome.

Electron microscopic visualization of HCV has not been verified[7]. Its genome has been cloned; these cloned peptides can react with antibody to HCV. Detection of antibodies to cloned peptides makes the basis of various screening tests used in blood banking. First generation enzyme immunoassays became available in 1989 and were soon replaced by 2nd generation assays with improved specificity. With identification of various subtypes of HCV and further cloning of its subtype specific peptides, highly sensitive and specific third generation assays are available[8].

In spite of donor screening with highly specific and sensitive methods transmission of virus through blood transfusion cannot be avoided. The virus remains undetectable due to prolonged incubation period. A person acquiring HCV infection becomes potentially infective long before seroconversion. It is therefore, important to carryout vigilant medical history interview prior to donor selection. This study was planned to assess frequency of HCV in blood donors keeping in view that high-risk groups likely to be seropositive for HCV are excluded on the basis of initial interview.

MATERIAL AND METHODS

All blood donors reporting to Combined Military Hospital Quetta from 1st Jan 2000 to 31st Jan 2001 were included in this study. The donors were subjected to following criteria:

Selection criteria:

1. Age between 18-58 years[9]
2. Weight > 50 Kg.[10]
3. Hemoglobin > 12.5 g/dl[9]

Exclusion criteria:

1. History of viral hepatitis after the age of 10 years[9,10].
2. Drug abuse, surgery, body piercing, tattooing, and blood or blood component transfusion within 12 months[10].
3. Renal, cardiac, pulmonary or hepatic disease.

Three ml venous blood was collected and serum was separated. Anti-HCV screening was performed using 'bioelisa' HCV screening kit of 'BIOKIT', S.A Spain. It is a third generation quantitative ELISA test. Quality control was assured by running positive and negative controls provided by manufacturer. Additional positive control sera preserved by our laboratory were also employed along-with each batch.

RESULTS

A total of 1635 prospective blood donors came to donate blood at the blood bank in CMH Quetta from 1st January 2000 to 31st January 2001. All donors were males and between the ages of 18-48 years. 135 (8.26%) were deferred on initial interviewing. Table-I shows the causes and their relative percentages. Majority of the deferrals (3.7%) were due to past history of jaundice. Other causes were surgery, tattooing or body piercing and injury including road-side accidents.

Out of the 1500 donors accepted, 1300 (79.5%) were first time donors, while 200(12.2%) were repeat donors. Although, only 456 (30.4%) of the total donors bled were in the age range of 31-40 years, it is pertinent to point out that 21 (1.4%) of HCV sero-positive donors belong to this age group. Table-II shows the age wise distribution of the donors bled and those found to be HCV positive.

Table-I: Number and percentages of various causes of donor deferral

Causes	*No. & Percentage of donors deferred*
Jaundice	60(3.7%)
Injury	31(1.9%)
Surgery	17(1.04%)
Tattooing/body piercing	15(0.92%)
Drug abuse	08(0.49%)
Past history of transfusion	04(0.24%)
Renal/hepatic disease	None
Cardiac/pulmonary disease	None
TOTAL	135(8.26%)

Table-II: Age wise distribution of total blood donors bled and anti-HCV sero-positive donors

Age Range in Years	*No. & Percentage of donors bled*	*No. & Percentage of donors positive for HCV*
18-22	350 (23.3%)	01 (0.07%)
23-26	330 (22.0%)	02 (0.13%)
27-30	290 (19.3%)	04 (0.27%)
31-34	228 (15.2%)	09 (0.6%)
35-40	228 (15.2%)	12 (0.8%)
41-45	60 (4.0%)	Nil
>45	14 (0.93%)	Nil
TOTAL	1500	28 (1.87%)

DISCUSSION

The symptoms of hepatitis C are difficult to recognize. Although progressive in nature they are often very mild, at least in the early stage of infection. For more than six months following initial infection, the disease is virtually unidentifiable. Low-level infection, in which the infected individual is virtually asymptomatic but still highly contagious, may continue for years even decades, before progressing significantly. It is important to recognize high-risk group prior to phlebotomy to prevent blood donation by donors with undetectable disease or who are more likely to be seropositive. Donor selection carries vital importance in blood banking. The medical interview is the first important step in ensuring a safe blood supply and should be performed by a trained, proficient, and sensitive person on a pre-designed, uniform donor interview questionnaire[11]. Our donor rejection rate on the basis of initial interview was 8.26%. Main causes of donor rejection were history of trauma, surgery and jaundice in the recent past. This may be due to hepatitis-A related jaundice which is common in our set up, specially in areas with poor sanitation and improper water supplies as in various parts of Balochistan.

Our findings of higher frequency with increasing age is in conformity with other data. This observation has been supported by the data collected by Murphy et al, they concluded that age specific HCV seroprevalence rose from 0.5 per 1000 donors younger than 20 years to a maximum of 6.9 per 1000 in donors aged 30-39 years[12]. 12.2% of our donors were repeat donors; 2% of these were seropositive as compared to 1.85% in first time donors. This number of donors in our opinion is too small to draw inferences.

Seroprevalence of anti-HCV varies world wide. It is 6% in blood donors in Africa, 1.5% in Japan, 0.6% in USA, 0.24% in Finland and 0.17% in UK[13-17]. Various studies carried out in Pakistan show seroprevalence from 0.7% to 20%[4,5,18,19]. In our study we found 1.87% donors seropositive for anti-HCV that agrees to a

study carried out at Liaquat National Hospital Karachi with 1.76% donors anti-HCV positive[18]. Another study conducted at Karachi reported 0.7% seropositivity for HCV among higher secondary school student blood donors[5]. Data collected at our center and at Karachi show significantly lower seroprevalence than Punjab. Seroprevalence in the general population in Balochistan is not established due to lack of representative studies, it is expected not to be very different from rest of the country (4-7% seroprevalence in Pakistan.)[20] In fact blood donors tend to be highly screened population and therefore their anti-HCV prevalence rates might not reflect those in general population[6]. Younger age group of donors and vigilance on donor selection are probably the main factors that resulted in low seroprevalence in our study. This observation is not supported by enough data, further studies are thus recommended.

CONCLUSION

Healthy donor selection is of paramount importance in blood bank services. Vigilant donor selection and younger age group affect frequency of HCV. Further studies are recommended to support this observation.

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