International Journal of Pathology; 2003; 1:22-24

Markers of Viral Infection in Haemophiliacs

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Seroprevalence of Hepatitis B surface antigen (HbsAg), anti-HCV IgG and anti-HIV IgG was determined in 100 people with Haemophilia (PWH), registered with Haemophilia Patient Welfare Society (HPWS), Lahore Zone, Pakistan. The study shows that none of the PWH were infected with HIV whereas a modest 4% were positive for HbsAg. However, there was a high level of anti-HCV seropositivity (56%) in our PWH, including many patients in younger age groups. When compared with figures from PWH in other regions of Asia like 23% in Western India, 33% in Sri Lanka and 15% of those in Iran, this figure is one of the highest. This rate is a reflection of the same rising trend in our population that is now exceeding 10%. The practice of unscreened blood/blood-products transfusions in the backdrop of high prevalence of HCV in our population is responsible for high figures seen in PWH. The need is to increase awareness level amongst the patients, health care worker and policy makers about these transfusion associated viral infections in a group of patients who already had a hereditary disorder of severe nature.

Keywords: People with haemophilia (PWH), Blood borne viruses, HBV, HCV, HIV.

Introduction

People with haemophilia (factor VIII & IX deficiency) and other clotting factor deficiencies are particularly at risk of acquiring blood borne viral infections like Hepatitis B virus (HBV), Hepatitis C virus (HCV) and Human immunodeficiency virus (HIV) through transfusion with unscreened blood and blood products.[1] This risk is higher in the developing world due to lack of strict regime for screening of blood and its products before transfusion.[1, 2] The need for screening the blood for viral markers may be overlooked in an emergency setting where either testing facilities are not available or can not be afforded by the patient. In Pakistan, majority of PWH can not have the luxury of having highly purified plasma derived or recombinant factor concentrates for prophylaxis and for them blood transfusion remains the mainstay of management. Thus the chances of becoming infected with any of these viruses increase with the number of transfusions. With this in view, we set out to determine the seroprevalence rates for the three markers of viral infection in our PWH and compare this with recently published data.

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Patients and Methods

This was a single center retrospective study involving patients registered since 1996 with HPWS, Lahore zone (HPWS is affiliated with World Federation of Haemophilia). After registration, patients were diagnosed as having haemophilia, von Willebrands disease (vWD) or other clotting factor deficiencies and then categorized as having mild, moderate or severe deficiency according to standard guidelines.[3] Serum samples for viral markers were drawn from PWH at the time of registration and then tested at different times afterwards. First 100 people for whom results of viral screening were complete, were included in the study. Screening was carried out at Lahore Haemophilia Center by ELISA (Enzyme linked immunosorbent assay) technique. The sera were tested by 2nd and 3rd generation ELISA kits (Abbott and Murex).

Results

The ages of the patients included in this study ranged between 1 & 47 years with age break-up as shown in Table 1. The most common diagnosis in 65% patients was Haemophilia A, followed by 19% patients for vWD and 9% for Haemophilia B (Table 2).

The results for viral markers revealed that none of the 100 PWH tested were positive for HIV antibodies, whereas 4% tested positive for HBsAg

(Table 3). In the later group, two patients were 1 and 3 years old and the other two were 22 and 23 years old. The percentage of PWH testing positive for antibodies to HCV was 56%. The age break up is shown in Table 4 with all age ranges seen infected. Out of 56 anti-HCV positive cases, samples from 32 are being processed by PCR (Polymerase Chain Reaction) for HCV RNA.

Table 1: Age Range of PWH and Other Coagulation Disorders (n = 100)

Age Range (years)	Percentage
0-10	34
11-20	21
21-30	21
31-40	08
41-50	02

Table 2: Break-up of Coagulation Disorders (n = 100)

Type of Coagulation Disorder	Percentage
Haemophilia A	65
von Willebrand Disease	19
Haemophilia B	09
Factor VII Deficiency	02
Factor I Deficiency	02
Factor X Deficiency	01

Table 3: Seroprevalence of Viral Markers (n=100)

Viral marker	Percentage
HbsAg	04
Anti-HIV antibodies	0
Anti-HCV antibodies	56

Discussion

Major source of viral infection in PWH has been the infected unscreened blood or blood clotting agents. Heat treatment for viral inactivation was introduced in mid 80's for blood clotting agents.[4] In the UK, all haemophiliacs who had received blood products before this time contracted HCV and it has been suggested that almost one third would also be infected with HIV.[5] However in Pakistan these clotting agents have not been used because of inaccessibility and prohibitive cost for majority of patients. The other major factor has been low seroprevalence of HIV in our local population.[6] Therefore we can expect that HIV infection will not be a problem for our PWH. Indeed, our data confirms this as none of PWH are found infected with HIV despite having received unscreened blood transfusions.

Table 4: Age Range of Anti-HCV Positive PWH (n=56)

Age range (years)	Percentage
0-10	14
11-20	21
21-30	25
31-40	11
41-50	02
Not recorded	15

Four percent of our PWH had evidence of chronic infection with HBV. Two of the patients were children aged 1 and 3 years. It is not possible to clarify if both got infected perinatally from their mothers or as a result of a contaminated blood transfusion. In either case, both infections could have been prevented by timely administration of HBV vaccine.

As for HCV, situation is quite the opposite from HIV or HBV. More than half of our PWH are already infected with HCV, which is one of the highest figures when compared with other studies that have been published recently.[7-11] A study by Ghosh et al[7] reported a figure of 23% anti-HCV seropositivity for

the Western Indian haemophiliacs. In a separate study from Iran, anti-HCV was found in 15% of PWH against a prevalence of 0.59% in their healthy blood donor control group.[8] In the same study, 0.36% of Iranian PWH were also found infected with HIV.[8] In Sri Lanka, 33% PWH had evidence of infection with HCV.[9] A Brazilian group found out that 44% of their PWH were infected with HCV[10] and in Jamaica 41% haemophiliacs had evidence of infection with HCV[11] (see figure 1).

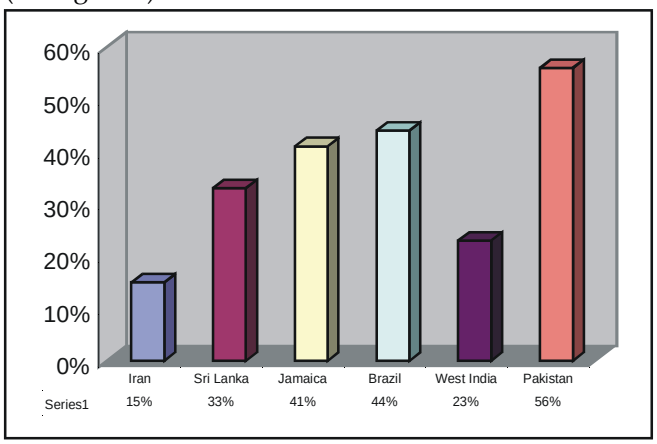

Fig. 1: Anti-HCV Seropositivity in PWH in Different Countries.

In our study we were unable to include controls from healthy population for the viral markers as this was a retrospective analysis. For this reason, figures from other studies were considered. The seroprevalence of anti-HIV antibody was found to be 0.35% in 2569 sera submitted for testing from a low risk population of Lahore and surrounding areas.[6] In a study by Usman et al, 4.2% of 8000 prospective military recruits were found positive for HBsAg and 4.3% for anti-HCV antibody.[12] A report from Karachi found 4.8% healthy donors out of 560 positive for HBsAg and 1.8% carrying anti-HCV antibodies.[13] Other anti-HCV data from Lahore found anti-HCV seroprevalence to be in the range of 10% in general population that was not considered to be at high risk for acquiring HCV.[14]

The HCV epidemic in our general population has already become a major public health problem and PWH are even worse affected. We should treat this situation as a priority and try to achieve the goal of providing viral marker screened donor blood for our PWH. We would need resources and proper health planning to manage our PWH and HCV infected population in the community as HCV-related deaths are expected to triple over next two decades becoming responsible for greater mortality than HIV infections.[15] The measures have to be directed towards provision of safe blood and its products to everyone and to check the increase in spread of HCV infection in general population through awareness campaign on war footing. This will have a favorable impact on controlling the spread of HCV infection in our PWH as well.

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