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Haematology International Journal
ISSN: 2578-501X

Transfusion Transmitted Infections in Patients with Haemophilia, a Study from Western Rajasthan, India

Yedale K, Kalita JM and Gadepalli R*

Department of Microbiology, All India Institute of Medical Sciences, India

***Corresponding author:** Ravisekhar Gadepalli, Associate Professor, Department of Microbiology, All India Institute of Medical Sciences, Jodhpur-342005, India, Tel: 919680009207; Email: gadepallirs@gmail.com

Research Article

Volume 4 Issue 2

Received Date: July 06, 2020

Published Date: July 21, 2020

DOI: 10.23880/hij-16000165

Abstract

Introduction: Haemophilia is one of the predominant congenital coagulation disorder and a disease without ethnic or geographic limitations with incidence approximately 20 per 100 000 male births. Haemophilic patients are in regular need of blood and blood products and prone to risk of acquiring infections such as hepatitis B, C (HBV, HCV) and human immunodeficiency virus (HIV).

Materials and methods: In this descriptive study, 98 haemophilic patients were selected for screening of HIV I and II, HBV, and HCV through the rapid immunochromatographic test method. Positive cases were confirmed by third generation enzyme linked immunosorbent assay (ELISA).

Results: In this study, prevalence of hepatitis B among haemophilia patient was zero and prevalence of hepatitis C and HIV was 1.02% each.

Conclusion: Prevalence of transfusion transmitted infections is much lower in this study than previous studies. The use of advanced methods, more sensitive tests, and virally inactivated factor concentrates might contribute to this reduction of viral infections in these patients.

Keywords: Haemophilia; Transfusion transmitted infection; HBV; HCV; HIV

Abbreviations: ELISA: Enzyme Linked Immunosorbent Assay; HIV: Human Immunodeficiency Virus; HBsAg: Hepatitis B Surface Antigen; FFP: Fresh Frozen Plasma.

Introduction

Haemophilia is one of the major hereditary diseases worldwide. It is an important cause of morbidity, early mortality and a lot of financial and emotional misery for a family. Haemophilia, one of the predominant congenital coagulation disorder and a disease without ethnic or geographic limitations, its incidence approximately 20 per 100 000 male births [1,2]. Haemophilic patients are in regular need of blood and blood products and prone to risk of acquiring infections such as hepatitis B, C (HBV, HCV) and human immunodeficiency virus (HIV). One of the most important transfusion transmitted infection is Hepatitis C. Prevalence of hepatitis C in the general population was reported from 0.2% to 40% in different countries [3,4]. High prevalence of such viral infections has been also reported in haemophilic patients from all over the world [5]. The most common way of HCV transmission was blood transfusion before 1996 and after that changed to injectable drug abuse [6]. From 1996, blood products have been tested before transfusion for transmissible infections. Because of screening, transmission and incidences of such infections were dramatically reduced [5,7]. The concept of the ''safety tripod'' for safe blood products include selection of blood donors of an appropriate safety profile; testing of all blood products to ensure the exclusion of detectable transfusion

transmissible pathogens; and treatment of the product or intermediates during manufacture to ensure elimination of any contaminating pathogens [8].

This study was conducted to observe the burden of transfusion transmitted infections among haemophilic patients.

Materials and Methods

In this descriptive study, 98 haemophilic patients were selected for screening of viral markers. Serum samples from all the subjects were tested for antibody against HIV I and II, hepatitis B surface antigen (HBsAg) for HBV and HCV antibody through the rapid immunochromatographic [Meril diagnostics, Gujarat, India] test method. Positive cases were confirmed by third generation enzyme linked immunosorbent assay (ELISA) [Alere TrueLISA test, India] method according to manufacturer's instruction.

Statistical Analysis

The interpretation and analysis of the data was done by using Microsoft Excel. The quantitative data were expressed as numbers and percentages in tabular form.

Results

A total 98 haemophilic patients were selected for screening. Demographic profile of the study group is depicted in Table 1. Serological profile of triple viral marker (HBsAg, Anti HCV, HIV I and HIV II antibody) among the study group is depicted in Table 2.

Age group in years	Male	Female
0-10	32	1
11-20	38	1
21-30	21	0
31-40	2	0
41-50	2	0
>50	1	0
Total (%)	**96 (97.96)**	**2 (2.04)**

Table 1: Demographic profile of the study group.

Viral markers	ICT test positivity (%)	ELISA positivity (%)
HBsAg	0	0
Anti HCV	1 (1.02)	1 (1.02)
HIV I&II	1 (1.02)	1 (1.02)

Table 2: Serological profile of the study group.
ICT- Immunochromatographic test

Discussion

India is a developing country with lower economic means and the problem of transfusion-transmitted infection is more serious where factor replacement therapy in haemophilia and other bleeding disorder patients is based mainly on fresh frozen plasma (FFP) and its components. FFP or other blood products that they receive are may not always appropriately screen for transmissible agents. Treatment with partially screened blood products has been associated with infections such as hepatitis B, C (HBV, HCV) and HIV. Apart from these three pathogens which are considered for most cases of acquired blood-borne infection, in addition, different viruses such as HTLV and parvovirus B19 have also been reported in haemophiliacs [9]. 85% of the world's haemophilia patient lives in countries with limited medical or financial resources. It is difficult for those patients to obtain viral inactivated clotting products. Many patients are treated with locally supplied blood products and its components only [10]. Before 1960, bleeding was the main lethal complication in haemophilia patients, but during the 1980s the leading cause of mortality among haemophilia patients were infectious complications with HBV, HCV and HIV [11]. In the present study out of total 98 patients screened one patient (1.02%) was positive for anti HCV antibody and one patient (1.02%) was positive for HIV I antibody by both immunochromatographic test and ELISA. None of the patient was positive for hepatitis B surface antigen (HBsAg). This prevalence is much lower than report from one study done in western India in which the prevalence of HIV, HBsAg, and HCV has been reported to be 3.8%, 6%, and 23.9%, respectively [12]. However this study was conducted from 1995 to 2000 period and most of the seropositive patient might receive blood transfusion before 1996. In 1996, various steps were taken to minimize the risk of transfusion-related or transfusion-transmitted infections. These include, quarantine of plasma until the donor has been tested or even retested for antibodies to HIV, HCV, and HBsAg. Similarly, clotting factors are now subjected to various viral inactivation procedures like heat or solvent/detergent treatment. All these steps have resulted in reduced risk of transfusion-related or transmitted infections since 1996. In one study from Pakistan where a total of 173 multi-transfused male haemophilia patient showed a prevalence of 51.4% for HCV, 1.73% for HBV and nil for HIV [13]. Another recent study from India showed seropositivity among haemophilia patient was 1.75% for HIV, 1.75% for HBsAg, and 13.15% for HCV [14]. In thirty-one studies from Afganistan, consisting the data of 132500 individuals for HCV and 132981 for HBV, the prevalence was 1.1% for HCV and 1.9% for HBV [15]. In the present study one patient aged 50 years showed seropositivity for HCV, who started receiving blood transfusion before 1996, however the other patient who showed seropositivity for HIV I is seven years old. This

signifies that screening for HIV in certain blood bank is still not up to that level by which patient in window period can also be detected. The limitations of this study are small sample size and retrospective nature of the study in which clinical correlation and important history were missed.

Conclusion

In this study, prevalence of hepatitis B among haemophilia patient was zero. However prevalence of hepatitis C and HIV was 1.02% each which is much lower than previous studies. The use of advanced methods, more sensitive tests, and virally inactivated factor concentrates might contribute to this reduction of viral infections in these patients.

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