

A study on Incidence of Viral Infections in Multitransfused Hemophilia Patients

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Abstract: Hemophilia is an inherited bleeding disorder. In majority patients either clotting factor viii is in low level (Hemophilia A) or clotting factor ix is deficient (Hemophilia B). For the management of hemophilia, a patient needs to be transfused purified factor preparation or cryoprecipitated plasma. This makes patient susceptible to transfusion transmitted infections. In our study 115 patients were screened for HBsAg, HCV and HIV antigen markers to check safety of cryoprecipitate they receive. Only one person was found to be HBsAg positive and one person was HCV positive. No seropositivity for HIV was found. Advance procedure for virus inactivation and strictly maintaining a pool of selected donors for plasma can be major causes for such rate of viral infection in hemophilic patients.

Key Words: Hemophilia, Blood Transfusion, Transfusion Transmitted Viruses

I. Introduction

Hemophilia is a genetic disorder linked to x chromosome. Males suffering from this disorder mostly lack either clotting factor viii or ix. In rare cases there may be deficiency of other factors. As a result they loose substantial amount of blood due to injuries or spontaneous bleeding. They require to be treated with purified factors or fresh frozen plasma. With increase in age and activities there are chances of getting microbial infections due to multiple transfusions.

II. Materials and methods

At Hemophilia Society, Rajkot a group of 156 hemophilic patients were registered initially in the study, at the end of the study in 2008 we have registered 232 hemophilic patients. Transfusion and clinical records of all patients were maintained throughout the study.

Serological study

Frozen samples were tested after the study period for various viral markers in the same laboratory by one person using the same batches of reagents and kits. Tests were carried out by commercially available, third generation, enzyme linked immunosorbent assay (ELISA) for the following TTD markers: (i) HBsAg (Microscreen HbsAg ELISA Test Kit by Span Diagnostics) (ii) antibodies to HCV (SP- NANBASE C-96 3.0 test kit by General Biological Corp.); (iv) anti HIV I/II (Enzaidis HIV 1+2 ELISA test kit by Span Diagnostics). Tests could not be repeated due to lack of serum samples and in some cases because of high reagent cost.

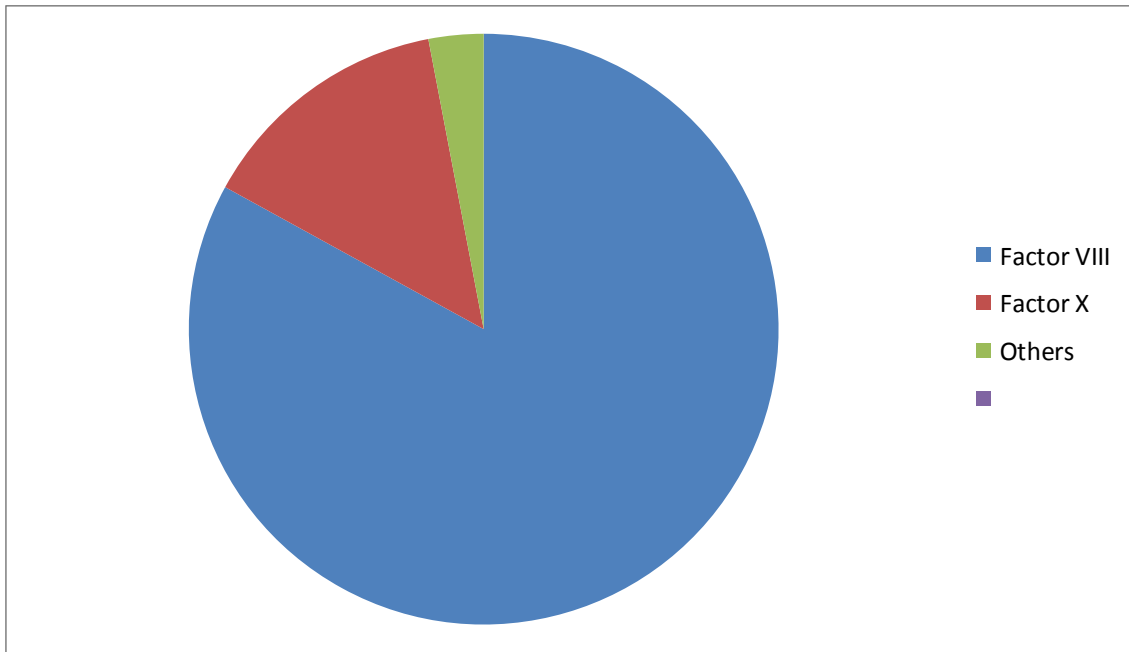
III. Results

Hemophilia a hereditary disorder of Coagulation results in deficiency of Factor VIII (Hemophilia A) or Factor IX (Hemophilia B) or rarely due to deficiency of other clotting factors.

Table 1
Comparison of Factor Deficiency among Hemophilic Patients.

Sr.No.	Factor	NO.	%
1	VIII	193	83%
2	IX	32	14%
3	Others	07	3%

Table explains Factor VIII deficiency was observed in 83% of patients while 14% patients were having deficiency of factor IX and 3% of patients were having deficiency of other factors such as factor V. Factor VIII deficiency is most commonly found among Hemophiliacs followed by deficiency of Factor IX and other factors.



Hemophilia is a chronic physical condition affecting the child from birth. Age group wise distribution was studied.

Table 2
Age wise distribution of Hemophilic Patients

<i>Sr.no.</i>	<i>Age group</i>	<i>No.</i>	<i>%</i>
1	0-5 year	17	08
2	6-15 year	75	32
3	16-30 year	103	44
4	31 year	37	16

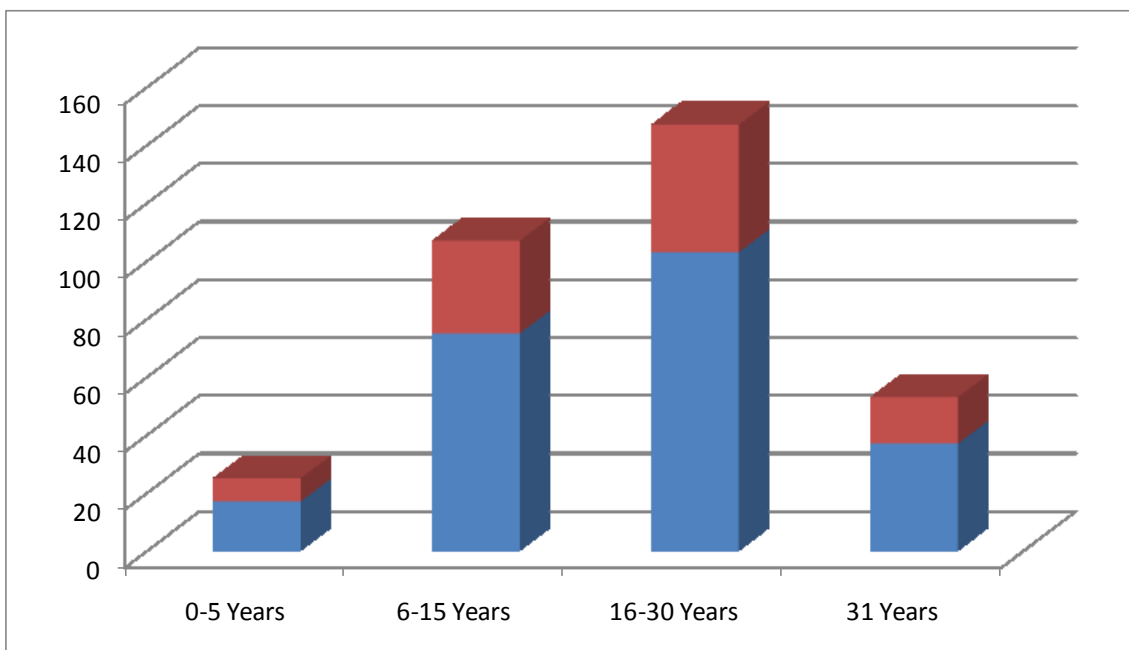


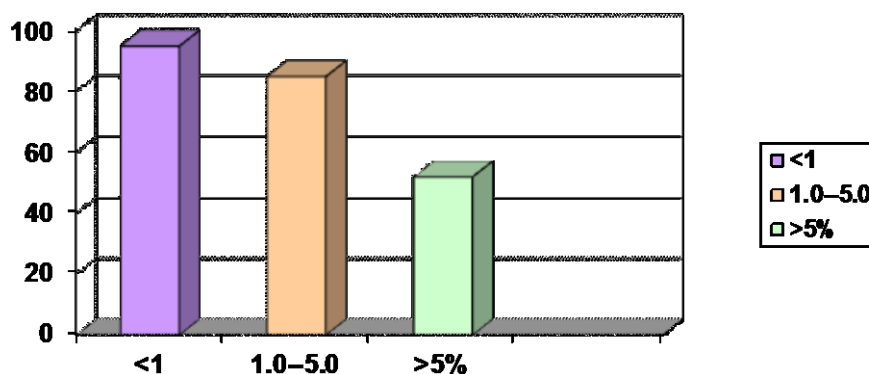
Figure indicates majority of the hemophilia patients under present study belonged to age group between 16 and 30 followed by 6-15 years, above 31 years of age and least number of patients were in 0-5 year age group. This data suggests good prenatal counseling and efficient management of the disease in patients. Hemophilia can be mild, moderate, or severe, depending on how much clotting factor is in the blood. We carried out factor estimation in order to establish severity of the disease.

Table 3
Distribution of Hemophilic Patients according to Factor Level

Sr. No.	Factor Level	No.	%
1	<1	95	40.94 %
2	1-5	85	36.64%
3	>5	52	22.42%

Figure shows Factor level in most hemophilia patients was found to be either below 1(40.94%) or between 1 and 5 (36.64%). There were 52 (22.42%) patients with factor level of more than 5. Majority of the patients under our study have severe hemophilia.

Distribution of Hemophilia patients according to Factor Level



Prevalence of Viral infections among Hemophilic Patients

Table 3

Sr.no.	Positivity	No.	%
1	HBS Positive	1	0.43 %
2	HCV Positive	1	0.43 %
3	HIV Positive	00	00 %

Figure shows that out of 232 patients, only 1 patient was found to be HBsAg positive and 1 was HCV positive. All patients were HIV negative. Because of the advanced procedures of inactivation of viruses such infections are less likely to occur.

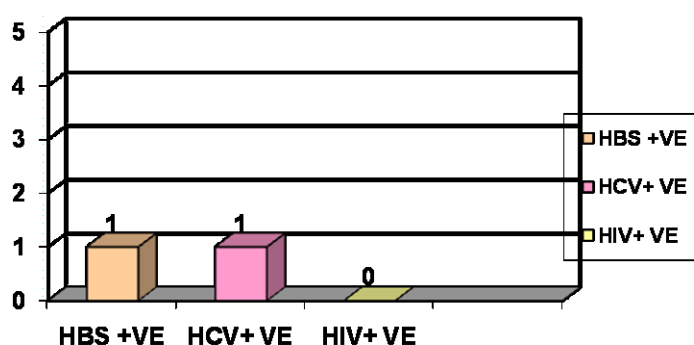
IV. Discussion

Blood transfusion currently faces interesting challenges. While advances have been dramatic, both in terms of technology and organizational up gradation in developed countries, blood transfusion in developing countries still tend to stagnate with acute shortages, lack of component therapy and safety problems.

HBsAg Seropositivity in Hemophilic patients

No.	Author	Year	Place	No. Tested	Positivity %
1	Nebbia G.	1986	Milan, Italy	44	55%
2	Sengupta B.	1992	Calcutta	37	24.3%
3	Chow M.P.	1991	Taiwan	11	9%
4	Ghosh K.	2000	ICMR, Mumbai	400	6%

5	Sharifi-mood B.	2007	Iran	81	4.9%
6	Present Study	2010	Rajkot, India	232	0.43%



As shown in the bar chart, the percentage of seropositivity for HBS +VE, HCV +VE, and HIV +VE is very low. The Hemophilia Society receives Fresh Frozen Plasma from a selected pool of donors carefully screened and restricted only for this purpose. This explains low seropositivity of Hepatitis B marker in our study. The reason for low seropositivity can be attributed to vaccination against Hepatitis B to all Hemophiliac subjects.

Prevalence of HCV among Hemophiliacs depends primarily upon the amount and type of product transfused. Almost universal exposure to HCV is observed in Hemophiliacs receiving untreated commercial clotting factor concentrates. However, Hemophiliacs receiving appropriately inactivated coagulation components from single donor cryoprecipitate generally remain Anti-HCV negative (Brettler, 1990).

HCV Seropositivity in Hemophilic patients

No.	Author	Year	Place	No. Tested	Positivity %
1	Chow M.P.	1991	Taiwan	11	100%
2	Ghany M.G.	1996	Louisiana, USA	100	79%
3	Samimi-Rad K.	2007	Tehran, Iran	76	43.4%
4	Sharifi-mood B.	2007	Iran	81	29.6%
5	Sengupta B.	1992	Calcutta	37	27%
6	Ghosh K.	2000	ICMR, Mumbai	400	23.9%
7	Present Study	2010	Rajkot, India	232	0.43%

HCV seropositivity in hemophilic patients found to be varying from 100% to 0.43% in various studies. As explained earlier policy of giving single donor cryoprecipitate to hemophiliacs is the reason of low seropositivity in our study.

Because of the enormous risk involved in transmission of HIV through blood, safety of blood and blood product is of paramount importance. Currently, the risk of transmission of HIV through transfusion is minimal, because effective preventive strategies, including new laboratory tests, have been implemented.

HIV Seropositivity in Hemophilic patients

No.	Author	Year	Place	No. Tested	Positivity %
1	Chow M.P.	1991	Taiwan	11	82%
2	Sultan Y.	1987	Paris, France	2049	48%
3	Ghany M.G.	1996	Louisiana, USA	100	42%
4	Sengupta B.	1992	Calcutta	37	24.3%
5	Ghosh K.	2000	ICMR, Mumbai	400	3.8%
6	Present Study	2010	Rajkot, India	232	00.00%

The virus that causes AIDS (HIV) can be carried in clotting factors as well as plasma. However, there has been no documented case of these viruses being transmitted during replacement therapy in our present study. Transmission of viruses has been prevented by careful screening of blood donors, testing of donated blood products, treating donated blood products with a detergent and heat to destroy viruses.

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