

Frequency of Hepatitis B and C in Children with Hemophilia

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ABSTRACT

Objective: To determine the frequency of hepatitis B and C in children with hemophilia

Study Design: Cross Sectional Study

Place and Duration of Study: This study was conducted at the Department of Pediatric Medicine, The Children's Hospital Lahore from 03-08-2017 to 28-02-2018.

Materials and Methods: A total of 90 children aged between 6 months and 12 years with were selected after taking informed consent from parents. Bio data was entered in a predesigned structured performa. Test for hepatitis B and hepatitis C were sent. All information and test results were kept confidential. Data analysis was done using SPSS version 16.

Results: Results of our study showed that most of patients i.e. 54% were between ages of 37-72 months and all of them were male. It was also seen that most of the patients belonged to poor socio-economic status i.e. 53.3%. Regarding hepatitis prevalence, hepatitis B was present in 4 (4.4%) patients whereas hepatitis C was positive in 8 (8.9%) patients. Stratification by age, duration of disease and economic status did not reveal any significant differences.

Conclusion: Hepatitis B was found to be positive in 4.4% whereas hepatitis C was found in 8.9% of hemophilic patients.

Key Words: Hemophilia, Hepatitis B, Hepatitis C.

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INTRODUCTION

Hemophilia is an X linked hereditary bleeding disease characterized by deficiency of factor VIII (HA) or factor IX (HB) which is also known as Christmas disease^{1,2}. The clinical manifestations of hemophilia correlate with the level of factor VIII and IX. Bleeding - spontaneous or secondary to trauma or surgery- may occur at any site of the body but the most common sites are the joints(80%) whereas bleeding in the CNS is the most serious site¹⁻⁴. Treatment is with concentrated factor VIII or IX depending on the type of hemophilia although some patients may need transfusion with whole blood when they develop massive hemorrhage¹⁻⁵. Patients with hemophilia and other coagulopathies treated with multiple blood transfusions and unheated clotting factor concentrates, including factors I, VIII, and IX have a high risk of acquiring hepatitis C, hepatitis B, and other viral infections.

Although viral inactivation and the use of recombinant technologies and the administration of HBV vaccine has significantly eliminated viral transmission via blood product transfusion, still HBV, HCV and HIV infections remain important causes of morbidity and mortality in countries where these technologies are unavailable¹⁻⁷. Various studies among multi-transfused haemophilia patients demonstrated a wide range of prevalence of transfusion-transmitted infections.

Studies have found prevalence of HbsAg in hemophilia patients ranging from 0.52% to 4.9% while that of anti-HCV 8.5% to 54%¹⁻⁷. This difference in prevalence highlight the importance of local control and sociodemographics highlighting the importance of preventive strategies in these high risk patients. Furthermore, with this variation and considering that most of the studies were from database having retrospective design, it is necessary to carry out a study prospectively with proper sample size¹⁻⁷. Study by Shamsdin SA² et al showed prevalence of HbsAg and anti HCV in hemophiliacs to be 1.4% and 8.9% respectively. Study from Iraq By Alhmeed WGA³ et al found prevalence of hepatitis B & C to be 0.52% and 9.9% respectively. Another study from Iran⁴, however, found no case of hepatitis B in screened patients and 8.9% positivity for hepatitis C. In sharp contrast, another study from Iran found prevalence of hepatitis B to be 1.1% and hepatitis C to be alarmingly high 54%. The study from Sudan⁵ on 62 children found 1 patient to be positive for hepatitis B and 8 for hepatitis C. Study by Sharifi-Mood B⁶ et al showed frequency of

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hepatitis B and C to be 4.9% and 29.6% respectively. This data highlights the need for undertaking a prospective comprehensive study for determining the frequency of Hepatitis B and C among children with hemophilia as there is no local study so as to raise awareness and potentially reduce transmission in these children.

MATERIALS AND METHODS

This was a Cross Sectional Study. This study was conducted in the Department of Pediatric Medicine, The Children's Hospital Lahore. The Duration of the study was Six month (03-08-2017 to 28-02-2018). Sample size was calculated to be 90 with 95% confidence interval, 6% margin of error and 8.9%⁴ expected percentage of hepatitis C in patients with hemophilia. The Sampling technique was non probability consecutive sampling

All children of both genders with hemophilia as per operational definition aged 6 months to 12 years who had been transfused more than 2 units of blood or clotting factors upto the time they were screened were included.

Children with evidence of HbsAg or anti HCV positivity as per medical record before start of transfusions. Children born to mother positive for hepatitis B per medical record. Children who underwent any surgical intervention per medical record Children with history of hemodialysis or peritoneal dialysis as per medical record were excluded

Statistical analysis was done using Statistical Package for Social Sciences (SPSS) version 16. Qualitative data like gender, economic status, number of patients with hepatitis B and C were presented as frequencies and percentages. Quantitative data i.e., age, duration of disease were presented as means and standard deviations. Data was stratified for age, gender, economic status, duration of disease to address the effect modifier. Pot-stratification chi-square test was applied to check the significance with p value ≤ 0.05 as significant.

RESULTS

In this study, total 90 patients were included. Fifty four percent patients were between the ages of 37-72 months while 46% were between 6-36 months. Mean age of the patients was 39.40 with a standard deviation of 3.78 months. In our study, all patients were male. Regarding duration of disease, 52.2% of the patients had disease ≤ 30 months while 47.7% patients had disease > 30 months. Mean duration of disease was 32.50 \pm 2.65 months.

Regarding economic status, most of the patients i.e. 53.3% had low economic status. About 36% patients belonged to mediocre families while 11.1% patients had high economic status. Hepatitis C was found in 8.9% of hemophilic patients whereas hepatitis B was found to

be positive in 4.4% of hemophilic patients. About 86% patients were having neither hepatitis B nor hepatitis C. When we stratified out data according to age of patients, duration of disease and economic status did not reveal any significant differences. P value was greater than 0.05 in all cases.

Table No. 1: Age Distribution (n=90)

Age (in months)	No. of patients	%
6-36	41	46.0%
37-72	49	54.0%
Total	90	100%

Mean \pm SD: 39.40 \pm 3.78 months

Table No. 2: Duration of Disease (n=90)

Duration (in months)	No. of patients	%
≥ 30 months	47	52.2%
> 30 months	43	47.7%
Total	90	100%

Mean \pm SD: 32.50 \pm 2.65 months

Table No. 3: Economic Status (n=90)

Economic Status	No. of patients	%
Low	48	53.3%
Middle	32	35.6%
High	10	11.1%
Total	90	100.0%

Table No. 4: Frequency of Hepatitis B & C (n=90)

Hepatitis	No. of patients	%
B	4	4.4%
C	8	8.9%
Nil	78	86.7%
Total	90	100.0%

Table No. 5: Stratification by Age (n=90)

Age Years	Hepatitis B		Hepatitis C		Total
	Yes	No	Yes	No	
6-36	2	39	3	38	41
37-72	2	47	5	44	49
P value	0.992		0.723		

Table No. 6: Stratification by duration of disease (n=90)

Duration Months	Hepatitis B		Hepatitis C		Total
	Yes	No	Yes	No	
≤ 30 months	2	45	5	42	47
> 30 months	2	41	3	40	43
P value	0.927		0.8112		

Table No. 7: Stratification by economic status(n=90)

Economic Status	Hepatitis B		Hepatitis C		Total
	Yes	No	Yes	No	
Lower	2	46	4	44	48
Middle	1	31	3	29	32
High	1	9	1	9	10
P value	0.825		0.735		

DISCUSSION

Hemophilia is an X linked hereditary bleeding disease characterized by deficiency of factor VIII or factor IX. Bleeding occurs spontaneously or secondary to some trauma or surgery. Treatment of bleeding in such patients include concentrated factor VIII or IX depending on the type of hemophilia type. Some patients may need transfusion with whole blood when they develop massive hemorrhage. Such patients with hemophilia when treated with multiple blood transfusions and unheated clotting factor concentrates have a high risk of acquiring hepatitis C, hepatitis B, and other viral infections. Although viral inactivation and the use of recombinant technologies and the administration of HBV vaccine has significantly eliminated viral transmission via blood product transfusion, still HBV, HCV and HIV infections remain important causes of morbidity and mortality in countries where these technologies are unavailable. The present study "frequency of hepatitis B and C in children with hemophilia" was conducted at Department of Pediatric Medicine, Children Hospital Lahore, to establish baseline data for hepatitis frequency in patients of hemophilia. It will also help pediatricians to reduce its transmission and severity by vaccination and early treatment.

Results of our study showed that most of patients i.e. 54% were between ages of 37-72 months and majority (90%) was of male patients. It was also seen that most of the patients belonged to poor socio-economic status i.e. 53.3%. Regarding hepatitis prevalence, hepatitis B was present in 4 (4.4%) patients whereas hepatitis C was positive in 8 (8.9%) patients. These results were comparable with the results of other studies. In a study conducted at Iran, Shamsdin SA and his colleagues showed prevalence of HbsAg and anti HCV in hemophiliacs to be 1.4% and 8.9% respectively². In another study conducted in Iraq by Alhmeed WGA et al, hepatitis B & C prevalence was found to be 0.52% and 9.9% respectively in hemophilic patients³.

Some studies showed quite surprising results. In one study conducted in Iran, it was observed that there were no hepatitis B cases screened patients. In this study, however, hepatitis C was found in 8.57% patients⁴. Similar results were also obtained in a study conducted at Sudan. In this study, a total of 62 hemophilic children participated and it was found that only 1 patient was positive for hepatitis B and 8 for hepatitis C⁶. These results were strikingly different from the results of other studies. The reason for low prevalence was age of the patients and number of transfusion of blood products. In childhood and early teens, number of transfusions is low which explains low prevalence of hepatitis B and C.

In sharp contrast to this, one study from Iran found prevalence of hepatitis B to be 1.1% and hepatitis C to

be alarmingly high 54% i.e. very high prevalence of hepatitis C among hemophiliacs⁴. Similar high prevalence results were also obtained in a study by Sharifi-Mood B et al who showed frequency of hepatitis B and C to be 4.9% and 29.6% respectively⁶. In his study, Vinelli, et al showed HBsAg positivity in 1.6% of hemophilics and anti-HBc positivity in 26.9%⁸. Surprisingly very high prevalence of hepatitis C was also observed in a study conducted in Iran by Nassiri Toosi, et al., who showed hepatitis C seropositivity in 83.3% of hemophilic patients⁹. In another study conducted by Alavian, et al., 60.2% were found to be anti-HCV Ab positive¹⁰. Similar results were also obtained by Borhany, et al., who showed HCV positivity in 54.4% and 1.73% positivity for hepatitis C¹¹. High prevalence of hepatitis C was also noted by Windyga et al., where its prevalence was 77.3% whereas HBs Ag was positive in 8.7% of them¹². These contrary results were due to number of factors. For example. Patients of all ages were included in some of these studies. With the advancing age, number of blood transfusions increases which in turn increases the risk for transmission of hepatitis B and C. Furthermore, prevalence also depends on number of transfusions. Increased requirement of blood product replacement increases transmission chances for hepatitis B and C.

Similarly, reason behind low hepatitis B prevalence as compared to hepatitis C was the introduction of hepatitis B vaccination. Hemophilic patients undergo hepatitis B vaccination, so, they have less chances of contracting hepatitis B. As no such vaccine is available for hepatitis C, so, its prevalence is high.

CONCLUSION

Hepatitis B was found to be positive in 4.4% whereas hepatitis C was found in 8.9% of hemophilic patients.

Author's Contribution:

Concept & Design of Study:	Hafiz Sajid Khan
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Revisiting Critically:	Hafiz Sajid Khan, Muhammad Obaid ur Rehamn
Final Approval of version:	Hafiz Sajid Khan

Conflict of Interest: The study has no conflict of interest to declare by any author.

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