PREVALENCE OF HBsAg AND ANTI-HCV ANTIBODIES IN POLY – TRANSFUSED β-THALASSAEMIA MAJOR CHILDREN IN LAHORE

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ABSTRACT

Objective:

- *To determine the prevalence of HBsAg and Anti-HCV antibodies in polytransfused thalassaemic children at two different Thalassaemia Centres i.e. The Institute of Haematology and Blood Transfusion Service (IHBTS) Punjab, Lahore and The Thalassaemia Centre at Sir Gangaram Hospital, Lahore.*
- *To compare the prevalence of these markers between two centres.*
- *To determine association of sero-positivity with number of transfusions.*

Material and Methods: It is a cross sectional study. All information was gathered by questionnaire. Blood samples of 150 thalassaemic patients were collected from two different thalassaemia centres and sera were screened for HBsAg and Anti-HCV antibodies by ELISA technique. SPSS version 16 was used to analyze the data. Chi-square was applied to determine the association between number of transfusions and sero-positivity.

Results: The prevalence of HBsAg and Anti-HCV antibodies was 0% and 68% respectively among the patients of IHBTS. 1% and 43% patients were positive for HBsAg and Anti-HCV antibodies respectively at Thalassaemia Centre at Sir Gangaram Hospital. The overall prevalence of HBsAg and Anti-HCV antibodies was 0.66% and 51.3% respectively. Prevalence of anti-HCV was more at IHBTS. An association was observed in increasing number of transfusions and increasing positivity of patients for Anti-HCV (p-value = 0.018).

Conclusion: There is a need to focus on our health safety managements. A higher prevalence of Anti-HCV was observed due to weak infrastructure of health care centres or blood banks.

Key words: Hepatitis B surface antigen, Anti-Hepatitis C Virus antibodies, Thalassaemia Major.

INTRODUCTION

HBV (Hepatitis B Virus) is DNA virus and HCV is RNA virus. Both viruses are mainly transmitted via blood and blood products.[1] According to WHO, 350 million people have chronic HBV infection and 170 million people of the world's population have chronic HCV infection.[2] There are certain high risk groups which are more prone to develop HBV and HCV infections. Thalassaemic patients are included in one of the risk groups.[3]

Thalassaemia is the most prevalent inherited blood disorder in the world. The average prevalence of Thalassaemia is 5% in Pakistan.[4] All the patients of thalassaemia major need blood transfusions for their survival.[5] Although blood transfusion is necessary for their life but it can be unsafe, if blood is not screened for the infectious agents. There are many reasons due to which infectious blood can't be detected. Possibly due to lack of resources in blood banks and health care centres, their weak infrastructure, inadequate management, untrained staff and poor quality screening devices for screening the blood of donors.[3]

By estimating the prevalence of HBsAg and Anti-HCV Antibodies among these patients we would be able to know the efficiency of blood banks and risk of having infections in our society. In this study, we have determined the prevalence of HBsAg and Anti-HCV Antibodies in transfusion dependent β-thalassaemic major patients at two different thalassaemia centres, IHBTS, Lahore and Thalassaemia Centre at Sir Gangaram Hospital, Lahore. In 2004, the prevalence of these viral markers already has been known at IHBTS [6] but we selected the same thalassaemia centre again to evaluate if there is any change now in the prevalence of these viral markers among the thalassaemic patients at the centre.

MATERIALS AND METHODS

Study was done by selecting 150 thalassaemia major patients at two different thalassaemia centres at IHBTS, Lahore and thalassaemia centre at Sir Ganga-

ram hospital from August to December 2012. Non probability consecutive sampling technique was used to select 150 patients. The age of these patients were ranging from 7 months to 11 years with the mean age of 6.62 (± 2.70 years). Both sexes of patients who had received more than one transfusions were included. Less than six months of children were excluded because of possibility of sero-positivity due to vertical transmission.

Children of above 11 years were excluded because screening for HIV and HBV was started in 1995 in public sector blood banks of Punjab but for HCV, the screening was initiated in year 2000.[6] Patients above the age of 11 years may have antibodies against HCV due to receiving unscreened blood and may give high prevalence for Anti-HCV. Patients, who had received blood transfusion only once, were also excluded from this study.

Their blood samples were collected and sera were screened for HBsAg and Anti-HCV antibodies by ELISA technique, optical density of solutions was measured by using ELx800 instrument.

A standard consented questionnaire was developed before conducting the study. An informed consent was taken from the parents / attendants of the thalassaemic children before the blood collection. 1ml of venous blood was allowed to clot to obtain serum for qualitative detection of virological markers i.e. HBsAg and Anti-HCV antibodies by ELISA technique. The test procedure for the detection of HBsAg and Anti-HCV Antibodies was conducted following the manufacturers protocol.

Statistical Analysis

All the data was analyzed by SPSS Version 16.0 for Windows. Categorical variable were presented as prevalence and frequencies. Continuous variables were presented as mean (± standard deviation). For categorical variables, Chi-square was used to observe the association.

RESULTS

The table 1 shows that the seroprevalence of HBsAg and Anti-HCV antibodies is 0% and 68.0% respectively among the patients of IHBTS. 1.0% and 43.0% patients are positive for HBsAg and Anti-HCV antibodies respectively of Thalassaemia Centre at Sir Gangaram Hospital. So the overall seroprevalence of HBsAg and Anti-HCV antibodies is 0.66% and 51.3% respectively. The prevalence of HBsAg is more in the patients of Thalassaemia Centre at Sir Gangaram Hospital as compared to IHBTS and for Anti-HCV, the prevalence is higher in the patients of IHBTS as compared to the patients of Thalassaemia Centre at Sir Gangaram Hospital.

The table 2 shows that among 150 patients, 92 (61.3%) are males and 58 (38.6%) are females. The patients are divided into 4 age groups. Only 1 patient is HBsAg positive and lies in third age group (6.5 – 9). Six, 27, 25, 19 are positive for anti-HCV in first, second, third and fourth age group respectively. The largest number of anti-HCV positive patients belong to the second age group (27/77).

The table 3 shows that out of 150, only 1 (0.66%) female patient is HBsAg positive.

Table 1: *Comparison of the Prevalence of Viral Markers between Two Centres.*

Names of Thalassaemia Centres	*HBsAg*		*Anti-HCV antibodies*		*Prevalence of HBsAg*	*Prevalence of Anti-HCV*
	Positive	*Negative*	*Positive*	*Negative*		
IHBTS	0	50	34	16	0%	68.0%
Thalassaemia Centre at Sir Gangaram Hospital	1	99	43	57	1%	43.0%
Total	1	149	77	73	0.66%	51.3%

Table 2: *Distribution of Patients Positive for Viral Mar-kers in Relation to Age Groups.*

Age Groups	*Sex*			*HBsAg Positive Patients*	*Anti-HCV Positive Patients*
	Male	*Female*	*Total*		
0 – 3	11	8	19	0	6
3.5 – 6	31	21	52	0	27
6.5 – 9	28	21	49	1	25
9.5 – 11	22	8	30	0	19
Total	92	58	150	1	77

Table 3: *Gender Wise Distribution of HBsAg and Anti-HCV Positive Patients.*

Gender	*% of HBsAg Positive Patients*	*% of Anti-HCV Positive Patients*
Males	0% (0/92)	51.0% (47/92)
Females	1.7% (1/58)	51.7% (30/58)
Total	0.66% (1/150)	51.3% (77/150)

Among 150 patients, 77 (51%) are anti-HCV positive. Out of 77 Anti-HCV positive patients, 47/92 (51.0%) are males and 30 / 58 (51.7%) are females. Both sexes have approximately equal anti-HCV positive percentage.

According to our study the interval with which patients require transfusion ranged from 8 – 90 days. The mean interval between two transfusions is 26.85 (± 12.93 days). It is assumed by this data that every patient receives transfusion after approximately one month. In this way we counted the number of transfusions received by each patient from the time of their first transfusion to up till now. Table 4 shows that the Anti-HCV positivity increased with the number of transfusions. Least percentage of patients is affected in first group and highest percentage of patients is affected in fourth group with maximum number of transfusions. An association is found between number of transfusions and number of Anti-HCV positive patients *p-value 0.018*.

Table 4: *Number of Transfusions in Relation to Anti-HCV Positivity.*

Number of Transfusions	*Total Number of Patients*	*Anti-HCV Positive Patients*	*% of Anti-HCV Positive Patients in a Group*
Up to 35	30	10	33
36 – 70	50	27	54
71 – 100	43	20	47
101 – 130	27	20	74
Total	150	77	51

DISCUSSION

In the present study very low prevalence of HBsAg and a very high prevalence of Anti-HCV is recorded among multitransfused thalassaemic patients. The combined prevalence of HBsAg is 0.66%. Only 1 patient is seen positive for this marker. When detailed history of this patient was taken, it was noticed that she had not received HBV vaccine. She had done her ear piercing by a shopkeeper and was on parenteral iron chelation therapy. In chelation therapies, re-use of disposable syringes is prevalent malpractice in our society.[6] These could be reasons of her HBsAg positivity. The reason of very low prevalence may be explained by vaccination programmes. Vaccination against Hepatitis B was included in Expanded Programme on Immunization (EPI) in July 2002 in Pakistan.[7] So it can be concluded here that vaccination is protecting our society against HBV. The result of our study is comparable to the study of Ocak S and his colleagues in Turkey. The prevalence of HBsAg in their study was 0.75%.[8] Another study was done in Pakistan and its prevalence of HBsAg was 1.25%.[9] In 2004, the prevalence for HBsAg was 1.7% [6] at IHBTS and now it is 0% at IHBTS, Lahore. The prevalence for HBsAg has been decreased at this centre.

The prevalence of Anti-HCV in our study is 68.0% at IHBTS and is 43.0% at Sir Gangaram Hospital. It is higher at IHBTS than at Sir Gangaram Hospital. The prevalence of the same viral marker was 35%, which was recorded in the study by Mahfooz[6] in 2004 IHBTS and now it is 68.0%. It is approximately double of the last time. But it cannot be concluded here that IHBTS centre has poor management because patients receive transfusions from more than one centres. Health workers in many centres do not take this profession seriously and play with the life of these patients. It has been recorded that more than 1.5 million pints of blood are collected each year in Pakistan. Joint United Nations Programme on HIV / AIDS (UNAIDS) has estimated that only 50% of the 1.5 million blood bags are screened.[7] Thus unscreened blood is a major cause of the high prevalence of Anti-HCV antibodies. There are also some other factors which can cause HCV infection like people receive blood from their relatives without screening due to lack of awareness, lack of resources in rural areas and usage of infected syringes by poorly trained staffs, so these could be certain reasons due to which high prevalence of Anti-HCV was seen. The combined prevalence of both centres was 51% for Anti-HCV in our study. Our result is comparable to the study done in India. Their prevalence for Anti-HCV was 54%.[10] Another cross sectional study was done by Qurat-ul-Ain and her colleagues in Pakistan. The prevalence in their study was 65%.[4] The result of this study and of our study has revealed the increased risk of HCV infection by blood transfusions in our community.

In this study, an association is found between the number of transfusions and Anti-HCV positive patients (*p-value = 0.018*). A gradual increase can be seen in the percentage of Anti-HCV positive thalassaemic patients with the increase in the number of transfusions (Table 4). Greater the number of transfusions more will be the chances of carrying the infection because patients are more exposed to the risk factor. Many other studies also proved this relation.[5,11]

It is proved from all previous studies and from the results of our study that there is an immediate need to introduce high quality screening devices in blood banks and the results of devices should be confirmed by the fourth generation ELISA technique. Appropriate precautions and safety measures should be applied in all blood banks for screening the blood prior to the transfusion. Qualified staff

should be appointed in blood banks so that they will be aware of all possible routes of infections to avoid transfusion associated infections. In-charge of the every blood bank and health care centre should keep an eye on the efficiency of the staff of his blood bank and health care centre.

CONCLUSION

1. Blood transfusion is a lifesaving intervention. However, every transfusion is carrying a risk of transmitting serious infectious diseases. Now a days, blood banks and health care centres of Pakistan are not adhering to safe practices so there is a need to pay an immediate attention towards the biosafety practice in both the public and private sector blood banks.
2. The concerned authorities should prepare / revise very strict rules and regulations for safe blood transfusions in Pakistan.

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