The Prevalence of Viral Hepatitis B and C among Multitransfused Thalassaemic Patients in Azadi Teaching Hospital in Kirkuk City

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Abstract:

***Background*:** Patients with thalassemia major are at high risk of hepatitis C and B due to the blood transfusion from donors infected by HCV and HBV. Hepatitis C virus (HCV) is the major cause of post-transfusion hepatitis infection (PTH).

***Objective*:** The aim of this study is to detect the prevalence of anti-HCV antibodies and HBs Ag and risk factors in multitransfused thalassemic patients in Kirkuk city to establish better preventive strategies.

***Patients and Methods*:** This study is conducted in Kirkuk city from Nov 2012 to March 2013 for HCV and HBV infection. A structured interview questionnaire is developed by the trained researcher to collect the demographic and risk factors. Statistical analysis was done by Chi-square test.

***Results*:** The prevalence of HCV is estimated to be (17.8%) and this is increased with increasing the requirement for blood transfusion in splenectomized patients while only (2.0%) is positive for HBV infection.

***Conclusion*:** The study shows a higher prevalence of HCV infection among multitransfused thalassemic patients with increasing requirement for blood transfusion in splenectomized patients.

***Key Words*:** Viral Hepatitis C and B, Thalassemia, Prevalence, Azadi Teaching Hospital, Kirkuk City, Post-transfusion hepatitis (PTH).

Introduction:

Thalassemias are a group of anemias that result from defects in the production of hemoglobin by reducing the rate of synthesis of α or β chains [(1)]. They are the most common genetic disorders world-wide, occurring more frequently in the Mediterranean region, [(2)] Indian subcontinent, South East Asia and West Africa [(3)].

Patients with Thalassaemia do not produce enough Hb A (α2β2) because their cells cannot manufacture either the α or the β polypeptide chains of human hemoglobin. α-Thalassaemia depresses only the production of α chains and β-Thalassaemia depresses only the production of β chains. Clinically both α and β Thalassaemia may occur in major, intermediate (homozygous), and minor (heterozygous) genetic forms [(4)].

β-Thalassaemia is an Autosomal recessive disorder characterized by reduced or absent β-globin chain synthesis, which can be caused by one of 180 mutations in the gene coding for the β-chain of the hemoglobin tetramer [(5)]. In Thalassaemia the imbalance of globin chain synthesis leads to red cell damage resulting in destruction of red cells in the bone marrow (ineffective erythropoeisis) and peripheral circulation (hemolysis) [(6)].

The management of Thalassaemia major essentially comprises of regular blood transfusion and life - long iron chelation therapy, Thalassaemic patients are prone to develop complications such as transfusion transmitted infection [7, 8].

Patients with Thalassaemia major are at high risk of hepatitis C due to blood transfusion from donor infected by hepatitis C virus [9].

Hepatitis C is an infectious disease that affects the liver caused by hepatitis C virus, a member of the Flaviviridae group which was discovered as new viral agent causing non-A non-B hepatitis by Choo and Coworkers in 1989 [10]. The WHO studies showed that 170 million people are infected by hepatitis C in the world [11].

Hepatitis C infects liver cells and cause severe inflammation in the liver with long-term problems. It may leads to disabling symptoms, cirrhosis and hepatocellular carcinoma [12, 13].

Chronic post-transfusion hepatitis C leads to hepatocellular necrosis, fibrosis and cirrhosis in patients with Thalassaemia and is accepted as an important cause of morbidity and mortality in these patients [14].

In case of hepatitis B, since an effective vaccine is available, immunization against this virus before transfusion management is started would effectively protect against transfusion transmitted hepatitis B. screening of blood before transfusion more perfect in the last years [15].

Patient and Method:

This cross sectional study was done at Thalassemia Department at Azadi Teaching hospital-Kirkuk during the period from the1st of November 2012 to the 1st of March 2013. A total of 242 cases of Beta-Thalasseemia major were chosen. They were included if they had before entering transfusion program and age more than 6 months, haemoglobin electrophoresis suggestion of homozygous Beta-Thalasseemia. A special form of questionnaire was prepared by the researchers including information about the cases such as: age, sex, previous surgical operations, age of start of blood transfusion, and number of transfused blood. In addition to that, a sample of blood (5 ml) had been taken from the patients by a venipuncture for detecting HBs Ag in order to be considered as Hepatitis B infection and anti-HCV to be considered as Hepatitis C infection by ELISA method. The results were analyzed by the use of Chi - square and a p-value less than (0.05) was regarded as significant.

Results:

(Table 1) shows that most of the patients are below ten years (208, 85.5%), because thalassemia is a hereditary disease that presented early in life.

(Table 2) shows that most of the patients (238, 98.3%), required one or two units of blood every month while in four patients(1.7%) the requirement is more frequent because of rapid hemolysis after excluding other causes of increase demand of red blood cells especially in those who refuse splenectomy.

(Table 3) shows that about one fifth (48, 19.8%) of the Thalassemic patients in Kirkuk center of thalassemia are infected with viral hepatitis (type C and B).

(Table 4) shows that most of patients with viral hepatitis infection were of type C (17.8%), while only five of them were of type B (2.0%). This is because of availability of vaccination against type B viral hepatitis which is started to be given from birth. Screening for type B also was started earlier by health centers than that for type C.

(Table 5) shows that splenectomy was done for (52, 21.5%) of the patients with thalassemia in Kirkuk Center of Thalassemia. Sixteen patients (30.8%) of them were infected by viral hepatitis of both types (C and B), with (12, 23%) and (4, 7.6%) respectively. While in non-splenectomized thalassemic patients there were (27, 14.2%) reported to be infected with viral hepatitis.

Table (1): Age and Sex distribution. (n=242)

Age /years	Total		Male		Female	
	No	%	No	%	No	%
<10	208	85.95	107	44.21	101	41.73
11-20	32	13.22	16	6.61	16	6.61
>20	2	0.83	1	0.41	1	0.41
Total	242	100.0	124	51.23	118	48.76

Table (2): Distribution of the patients according to the number of blood transfusion unit/year.

Blood transfusion requirement; unit/year	Number of patient	%
≤10	140	57.8
11-20	98	40.5
>20	4	1.7
Total	242	100.0

Table (3): Distribution according to the positive serological finding for hepatitis viral infection. (48/242)

Positive serology	No	%
HCV	43	17.8
HBS	5	2.0
Total	48	19.8

Table (4): Distribution according to the number of blood transfusion and type of viral hepatitis infection.

Blood transfusion unit/year	Total No.patients		Total positive hepatitis		HCV +ve		HBS +ve		p-value
	No	%	No	%	No	%	No	%	
1-10	140	57.9	20	14.3	19	13.6	1.0	0.7	<0.005
11-20	98	40.5	25	25.5	22	22.5	3.0	3.0	<0.005
>20	4	1.6	3.0	75.0	2.0	50.0	1.0	25.5	<0.005
Total	242	100.0	48	19.8	43	7.8	5.0	2.0	

Table (5): Distribution of viral hepatitis among splenectomized patients.

Patients	No.	%	HCV		HBV		Total	
			+ve	%	+ve	%	+ve	%
Splenectomized	52	21.5	12	23.0	4	7.6	16	30.8
Non-Splenectomized	190	78.5	27	14.2	5	2.6	32	16.8

Discussion:

Early and regular blood transfusion therapy in patients with beta-thalasseemia decreases the complications of severe anemia and prolongs survival. It's so particularly in the patients who are fortunate enough to receive an adequate regular iron chelation therapy and are, therefore, protected from organ damage by iron overload [16]. However, if there is a breach in safe blood transfusion, these patients are confronted by clinical challenges particularly in the form of transfusion-transmitted diseases, especially hepatitis C, B and HIV infection [17].

Fortunately HIV infection is still not a problem in our country and hepatitis B infection can be, to a greater extent, prevented by pre-transfusion immunization.

This study showed that the prevalence of HCV seropositivity in multiply transfused Beta-Thalassemic patients is (19.8%) and this is similar to 2 other studies done in Iran [18, 19].

In comparison with other countries, the prevalence of HCV in Iraq, in general, population is lower. The prevalence of HCV seropositivity in Egypt was (44%), [20] while in Jordan, it was (40.7%) [21] and in Saudi Arabia was (40%) [22]. The reason for this difference can be due to difference in the type and sensitivity of the tests, the prevalence of HCV in the relevant population and the time of screening. The countries with a higher prevalence of HCV in the general population have a higher prevalence rate among Thalassemic patients too. For instance in Egypt, the prevalence rate of HCV in the general population is (14.5%) [23]. While in Iran it is estimated to be less than (1%) [24]. In Iraq a study showed a prevalence rate of (0.3%) [15].

This study shows that those who need more number of transfused units /year have a statistically significant higher prevalence of hepatitis C. This finding is in agreement with some earlier studies [25, 27].

This study shows that splenectomized thalassemic patients (splenectomy done because of hypersplenism and increase requirement for blood transfusion) have a higher prevalence of HCV than non-splenectomized patients. Proper sterilization procedures are not practiced due to various reasons including burdens of patients undergoing surgeries or sometimes lack of awareness about the transmission of HCV. This observation was noticed in another study done in Iran. [28] Regarding Hepatitis B, this study shows a very low prevalence rate because of earlier screening for HBS Ag in Iraq since 1973 and because of effective vaccination program [15].

In conclusion patients with Beta-Thalassemia major are at risk of acquiring HCV infection and progression to liver failure and hepatocellular carcinoma, therefore, blood donor screening protocol and effective screening techniques are needed to prevent spread HCV infection among Beta-Thalassemic patients.

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