

Epidemiology and sequel of viral Hepatitis in patients with thalassemia in Thi-Qar province



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Abstract— Thalassemia is one of the greatest human monogenic diseases, These inherited disorders of hemoglobin synthesis are considered as a reduced production of globin chains of hemoglobin. Aim of study: To study the incidence and determinants of viral infection with hepatitis B and C in patients with thalassemia post blood transfusion. Patient and method: This cross sectional study was performed at thalassemia center from November 2019- April 2020. . All ages were included in this study. Two hundred (200) patients were included. Age range from(3 months - 46 years. .we send the patients for all investigations including Hb, Hb electrophoresis, liver function test, viral markers, renal function test, weight, length measure. SPSS version 23 was used for analysis. Results: of 200 thalassaemic patient, all of them on blood transfusion, 3 of them infected with hepatitis B (1.5%) and 26(98.5 %) patient infected with hepatitis C and the total number was 29 (14.5 %). Recommendation: All patient must checked several times before transfusion and the blood must be tested (2-3) times before transfusion and should use new instruments before transfusion.

Keywords: thalassemia , monogenic diseases, hemoglobin.

Introduction:

The thalassemias are the most common human monogenic diseases. (1) These inherited disorders of hemoglobin synthesis are characterized by a reduced production of globin chains of hemoglobin.(2) There is a growing evidence that the health and economic burden of thalassemia is increasing, owing to the population growth and epidemiologic transition in tropical region(3) and in other part of world (4-7). World-wide most important form are alpha and Beta thalassemias, which affect the production of alpha and beta globin chain respectively (8) B-thalassaemia is the most common form of thalassaemia ,most predominant in the Mediterranean area. Heterozygotes have thalassemia minor, a disorder in which there is typically mild anemia and little or no clinical incapacity, that identified only when iron therapy for a mild microcytic anemia be unsuccessful. Homozygotes(thalassemia major) either are unable to synthesise haemoglobin A or, create very little after first 4-6 months of life, they develop superficial hypochromic anemia. a-thalassaemia absent or reduced alpha chain synthesis is communal in southeast Asia. There are two alpha gene loci on chromosome 16 and so, each individual carries four alpha gene alleles. B-thalassaemia is the most common type of thalassaemia, most prevalent in the Mediterranean area. If one is deleted, there is no clinical effect If two are deleted, there may be a mild If three are deleted, the patient has haemoglobin H disease If all four are deleted, the baby is stillborn (hydrops-fetalis) (9). Majority of the patients with thalassemia require lifelong blood transfusions.10 and iron chelation therapy.(11,12) Hepatitis C infection, at present, almost 2% of the world population suffers from chronic infection with HCV.HCV (hepatitis C virus) is a major cause of chronic hepatitis, steatosis, fibrosis, liver cirrhosis, and hepatocellular carcinoma. HCV belongs to the Flaviviridae family and contains a single-stranded positive-sense RNA genome of approximately 9600 bases (13 ,14) The history of HCV's discovery and antiviral-drug development

offers a striking example of the effect of advances in biomedical research on disease outcome (15) HCV is a blood born virus .because of this mode of spread the key groups at risk are injecting drug users, Blood transfusion, & hemodialysis(16). Hepatitis B virus Chronic hepatitis B virus (HBV) infection is a significant health problem worldwide; it may cause serious complications such as cirrhosis, liver failure, and hepatocellular carcinoma (HCC)(17). Viral proteins of clinical Importance include the envelope protein, hepatitis B surface antigen (HBsAg); a structural nucleocapsid core protein, hepatitis B core antigen (HBcAg);and a soluble nucleocapsid protein, hepatitis B e antigen (HBeAg). Serum HBsAg is a marker of HBV infection, and antibodies against HBsAg signify recovery. A serum marker of active viral replication, HBeAg, is accompanied by serum levels of HBV DNA that are 100,000 to 1 million IU per milliliter or higher.

HBV relies on a retroviral replication strategy (reverse transcription from RNA to DNA),(18)

Risk factors include intravenous drugs, sexual intercourse, blood transfusion, dialysis, close contact with infected person, vertical and trans placental transfusion. (19)The infection can be diagnosed 30-60 days after exposure by testing the blood for part of virus and for antibodies against the virus (20). Blood transfusion as a process of receiving blood product into one's circulation intravenously. Transfusions are used for various medical conditions to replace lost components of blood. This process is considered when hemoglobin level is below 10 g/dl or hematocrit falls below 30%.

WHO recommended that all donated blood is tested for transfusion transmissible infections include HIV, HCV, HBV. So the prevalence of transfusion transmitted infection is much higher in low income countries compared with middle and high income countries. (21)

Aim of study:

To study the incidence and determinants of viral infection with hepatitis B and C in patients with thalassemia post blood transfusion.

Patient and method:

This cross sectional study was performed at thalassemia center from November 2019- April 2020. . All ages were included in this study. Two hundred (200) patients were included, . Age range from (3 months-46 years). .we send the patients for all investigations including Hb, Hb electrophoresis, liver function test, viral markers, renal function test, weight, length measure.

We use Hb meter for Hb checking, spectrophotometer for liver function test, randox kit, made in Egypt, spectrophotometer for renal function test ,Biomegrub Kit, made in Egypt, Age divided into : 1. less than 15 years 2. Between(15-45) 3. More than 45 years With frequencies <15 = 152,76.0 %, 15-45 =46,23.0%,>45 =2.1.0% . Sex Male: 100, 50.0% Female: 100,50.0% Blood group : A, B, AB and O.

Viral hepatitis screening : HBs antigen, hepatitis C (+ve and -ve) TSB, SGOT and SGPT normal , and high (abnormal).

Ethical considerations were involving the acceptance from general directorate of health in ThiQar, Thalassemia center office management and verbal consent had been attained from all participant or their parents regarding those who below 18 years.

We use SPSS(23) for statistical purpose and p value, (0.05= significant).

Results:

Variables	Subcategory	Frequency	percent
Age	<15	152	76
	15-45	46	23
	>45	2	1
Sex	Male	100	50
	Female	100	50
Blood group	A	52	26
	B	59	29.5
	AB	18	9
	O	71	35.5
Marital status	Married	7	3.5
	unmarried	193	196.5
Residence	Urban	114	57
	Rural	86	43
occupation	Employer	92	46
	Non employer	102	51
	House wife	6	3
Family history	Positive	143	71.5
	Negative	57	28.5
Site of transfusion	Al-Habboby	49	24.5
	Thalacemia center	16	8
	District hospital	34	17
	Outside ThiQar	23	11.5
	Bint Al-Huda	78	39

Table 2: Expected determinants and sequel among patients with thalassemia.

Variables	Subcategory	Frequency	percent
Age of diagnosis	< 6 M	63	31.5
	6-12M	83	41.5
	>12 M	54	27
Tahlacemic face	Yes	68	34
	No	132	66
Jaundice	Yes	29	14.5
	No	171	85.5
Source of blood	Relative	21	10.5
	Non	179	89.5
TSB	<1	167	83.5
	1-2	25	12.5
	>2	8	4
SGPT	Normal	166	83
	Abnormal	17.0	17.0
SGOT	Normal	168	84
	Abnormal	32	16
HBS antigen	Positive	3	1.5
	Negative	197	98.5
Hepatitis C antibody	Positive	26	13

HB or C	Negative	174	87
	Positive	29	14.5
Total	Negative	171	85.5
		200	100

Table 3: Determinants of hepatitis viral infection

Variables	Subcategory	HBs Ag (no, %)		X2, or F.E*	HC antibody (no, %)		X2 or F.E*
		+ ve	-ve	P	+ve	-ve	P value
Age	<15	1, 0.7	151, 99.3	4.751*	9, 5.9	143, 94.1	28,56
	15-45	2, 4.3	44, 95.7	0.137	16, 35	30, 65	0.001
	>45	0	2, 100		1, 50	1, 50	
Age of diagnosis	< 6 M						
	6-12M						
	>12 M						
Sex(no=%)	Male	1	99	0.873	11	89	0.707
	Female	2	98	0.377	15	85	0.118
Blood group	A	1,1.9	51, 98.1	0.841*	7, 13.5	45,86.5	1.788
	B	1,1.7	58,98.3	0.195	6,10.2	53, 89.8	0.067
	AB	0	18,100		4, 22.2	14, 77.8	
	O	1,1.4	70,98.6		9, 12.7	62,87.3	
Marital status	Married	0	7,100	0.110	2,28.6	5,71.4	1.555
	unmarried	3,1.6	190,98.4	0.898	24,12.4	169,87.6	0.178
Residence	Urban	2,1.8	112, 98.2	0.116	16,14	98,86	0.251
	Rural	1, 1.2	85,98.8	0.422	10, 11.6	76, 88.4	0.150
occupation	Employer	2,2.2	90,97.8	1.361	16, 17.4	76,82.6	3.386
	Non employer	1, 1	101,99	0.32	10,9.8	92, 90,2	0.025
	House wife	0	6		0	6	
Family history	Positive	2, 1.4	141,98.6	0.35	24,16.8	119, 83.2	6.350
	Negative	1,1.8	56, 98.2	0.441	2, 3.5	55,96.5	0.06
Site of transfusion	Al-Habboby	1,2	48, 98	1.75	4, 8.2	45, 91.8	7.554
	Thalacemia center	0	16	0.173	0	16	0.075
	District hospital	1, 2.9	33, 97.1		3,8.8	31,91.2	
	Outside ThiQar	0	23		6, 26.1	17,73.9	
	Bint Al-Huda	1,1.3	77, 98.7		13, 16.7	65,83.3	

Table 4: Determinants and some sequel of hepatitis viral infection.

Variables	Subcategory	HBs Ag (no, %)		X2, or F.E*	HC antibody (no, %)		X2 or F.E*
		+ve	-ve	P	+ve	-ve	P value
Pallor	Yes	2,3.3	59,96.7	1.879	9, 14.8	52,85.2	0.239
	No	1, 0.7	138, 99.3	0.194	17.,12.2	122, 87.8	0.156
Tahlacemic face	Yes	2,2.9	66, 97.1	1.448*	17,25	51,75	13.118
	No	1,0.8	131,99.2	0.229	9, 6.8	123,93.2	0.0001

Jaundice	Yes	1,3.4	28,96.6	0.871*	11,37.9	15.8.8	18.640
	No	2,1.2	169,98.8	0.321	18,62.1	156, 91.2	0.0001
Source of blood	Relative	2,9.5	19,90.5	10.224	2,9.5	19,90.5	0.251
	Non	1,0.6	178,99.4	0.029	24,13.4	155,86.6	0.259
TSB	<1	1, 0.6	166,994	6.169*	11,6.6	156,93.4	32.514
	1-2	2, 8	23, 92	0.123	9,36	16,64	0.0001
	>2	0	8		6,75	2,25	
SGPT	Normal	1,0.6	165,99.4	5.325	8,4.8	158,95.2	64.914
	Abnormal	2,5.9	32,94.1	0.071	18,52.9	16,47.1	0.0001
SGOT	Normal	1,0.6	167,99.4	5.817	11,6.5	157,93.5	38.652
	Abnormal	2,6.3	30,93.8	0.063	15,46.9	17,46.9	0.0001
	Negative						
Total	No.	3	197		26	174	
	Percent	1.5	98.5		13	87	

Discussion

In our study we took 200 patient, all of them thalassemic whether thalassemia major or minor.

We had been tested the association of incidence of hepatitis B, C post transfusion with different parameters.

First one was age, ranged from (3month - 46 year) and we found that there is no any significant relation between the age and HBV that's mean the age doesn't affect the incidence of HBV, and we found that there is significant relation between the age and HCV that's mean the age affect the incidence of HCV. second one was sex, with male number 100, female number 100 and we found that there is no significant relation between the sex and HBV that's mean the sex affect the incidence of HBV, and we found that there is no significant relation between the sex and HCV that's mean the age doesn't affect the incidence of HCV third one was blood group, and we found that there is no significant relation between the blood group and HBV that's mean the blood group doesn't affect the incidence of HBV, and we found that there is no significant relation between the blood group and HCV that's mean the blood group affect the incidence of HCV fourth one was marital status and we found that there is no significant relation between the marital and HBV thats mean the marital status doesn't affect the incidence of HBV, We found that there isno significant relation between the marital status and HCV that's mean the Marital status doesn't affect the incidence of HCV.Fifth one is the occupation, we found that there is no significant relation between the occupation and HBV that mean the occupation doesn't affect the incidence of HBV, and we found that there is significant relation between the occupation and HCV that's mean the occupation affect the incidence of HCV. sixth one was address, and we found that there is no significant relation between the address and HBV that's mean the address doesn't affect the incidence of HBV, and we found that there is no significant relation between the address and HCV that's mean the address doesn't affect the incidence of HCV. seventh one was other diseasesand we found that there is no significant relation between the other disease and HBV that's mean the other disease doesn't affect the incidence of HBV, and we found that there isno significant relation between the other disease and HCV that's mean the other disease doesn't affect the incidence of HCV. eighth one was pallor, and we found that there is no significant relation

between the pallor and HBV that's mean the pallor doesn't affect the incidence of HBV, and we found that there is no significant relation between the pallor and HCV that's mean the pallor doesn't affect the incidence of HCV. ninth one was jaundice, and we found that there is no significant relation between the jaundice and HBV that mean the jaundice doesn't affect the incidence of HBV, and we found that there is significant relation between the jaundice and HCV that's mean the jaundice affect the incidence of HCV. eleventh one was thalassaemic face, and we found that there is no significant relation between the thalassaemic face and HBV that mean the thalassaemic face affect the incidence of HBV, and we found that there is significant relation between the thalassaemic face and HCV that mean the thalassaemic face affect the incidence of HCV. eleventh one was family history, and we found that there is no significant relation between the family history and HBV that mean the family history doesn't affect the incidence of HBV, and we found that there is no significant relation between the family history and HCV that's mean the family history doesn't affect the incidence of HCV ,twelfth one was site of blood transfusion, and we found that there is no relation between site of blood transfusion and HBV that's mean the site of blood transfusion doesn't affect the incidence of HBV, and we found that there is no significant relation between the site of blood transfusion and HCV that's mean the site of blood transfusion doesn't affect the incidence of HCV. thirteenth one was source of blood, and we found that there is significant relation between the source of blood and HBV that's mean the source of blood affect the incidence of HBV, and we found that there is no significant relation between the source of blood and HCV that's mean the source of blood doesn't affect the incidence of HCV fourteenth one was TSB, and we found that there is significant relation between the TSB and HBV that's mean the TSB doesn't affect the incidence of HBV, and we found that there is significant relation between the TSB and HCV that's mean the TSB affect the incidence of HCV fifteenth one was SGPT ,and we found that there is no significant relation between the SGPT and HBV that's mean the SGPT doesn't affect the incidence of HBV, and we found that there is significant relation between the SGPT and HCV that's mean the SGPT affect the incidence of HCV, sixteenth one was SGOT and we found that there is no significant relation between the SGOT and HBV that's mean the SGOT doesn't affect the incidence of HBV, and we found that there is significant relation between the SGOT and HCV that's mean the SGOT affect the incidence of HCV.

Conclusion:

We take 200 patient all of them are thalassaemic on blood transfusion and we found that 3 of them infected with hepatitis B (1.5 %) and 26(98.5 %) patient infected with hepatitis C and the total number was 29 (14.5 %).

Recommendations:

All patient must checked several times before transfusion and the blood must be tested (2-3) times before transfusion and should use new instruments before transfusion

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