EPIDEMIOLOGIC STUDY OF HEPATITIS B AND C VIRUS AMONG THALASSEMIA PATIENT IN WASSIT GOVERNORATE/ IRAQ [+]

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Abstract:

Though regular blood transfusion improves the overall survival of patients with β-thalassemia, it carries a definite risk of infection with blood-borne viruses. therefore carried out this a cross sectional study to provide epidemiologic data on hepatitis B virus (HBV) and hepatitis C virus (HCV) among sample of β-thalassemic patients in Wassit governorate. Moreover, HCV infection-associated risk factors were investigated in this population. The presence of anti-HCV antibodies and hepatitis B surface antigen (HBs Ag) has been examined in a group of thalassemic patients who received blood transfusions in thalassemic center in Wassit governorate from October 2011 until April 2012, 326 cases with β- thalassemia were studied for detection of antibody against HBsAg and Anti-HCV antibodies were detected with an enzyme-linked immunosorbent assay (ELISA). Data were analyzed statistically by SPSS 19, and Statistical analysis was performed using the chi-square test.

Overall 24.2% were found to be anti-HCV positive in comparison 0.6% for hepatitis B virus the seroprevalence of HCV antibody among those who were ≤25 years old, intermediate thalassemic patients and received blood every 20 days were statistically significant association.

The prevalence of HCV infection is much higher among Wassit β thalassemic patients as compared with hepatitis B virus Routine screening of donated blood for HCV is highly recommended.

Key words:- **Hepatitis, hepatitis B and C, thalassemia**

دراسة وبائية لمرض إلتهاب الكبد الفايروسي نمط "ب" ونمط "جـ" ضمت مرضى الثلاسيميا في محافظة واسط / العراق

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المستخلص:

مع أن نقل الدمّ المنتظم يحسّن بصورة عامة البقاء لمرضى الثلاسيميا، ألا انه يحمل خطر مؤكّد من العدوى بالفيروسات المحمولة بالدمّ. لذلك أجريت هذه الدراسة المقطعية العرضية لتزويدنا بالبيانات الوبائية حول التهاب الكبد الفيروسي (نمط ب)، والتهاب الكبد الفيروسي (نمط ج)، ضمن عيّنة من مرضى الثلاسيميا في محافظة واسط. بالإضافة الى ان التهاب الكبد الفيروسي يعتبر من عوامل الخطورة المرتبطة بمرضى الثلاسيميا. التحري عن وجود الأجسام المضادة لالتهاب الكبد الفيروسي نمط ج والانتجين السطحي للنمط ب تم في مجموعة من مرضى الثلاسيميا الذين

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استلموا دمّ منقول من مركز الثلاسيميا في محافظة واسط من أكتوبر/تشرين الأول 2011 الى أبريل/نيسان 2012، 326 حالة مريض الثلاسيميا تمت دراستها لكشف الاجسام المضادة ضدّ التهاب الكبد الفيروسي نمط ب والأجسام المضادة للنمط ج حيث تم تحديدها باستخدام فحص الامتزاز المناعي المرتبط بالإنزيم(إليزا). البيانات تم تحلّيلها إحصائيا باستخدام نظام الحزمة الاحصائية للعلوم الاجتماعية الاصدار 19، والتحليل الإحصائي تم باستعمال اختبار مربع كاي. فقد تبين من خلال النتائج 24,2 % كانوا موجبين لالتهاب الكبد الفيروسي نمط ج بالمقارنة مع 0,6% للنمط ب. التهاب الكبد الفيروسي نمط ج ضمن أولئك الذين تراوحت أعمارهم بين اقل/ أو يساوي 25 سنة من العمر، مصابين بالحالة المتوسطة من الثلاسيميا والذين يتلقون دم كل 20 يوم كانت من العوامل التي يعتد بها إحصائيا. انتشار الإصابة بالتهاب الكبد الفيروسي نمط ج هو أعلى في محافظة واسط ضمن مرضى الثلاسيميا بالمقارنة مع التهاب الكبد الفايروسي نمط ب. لذى نوصي بالتحري الروتيني للمتبرعين بالدم حول التهاب الكبد الفايروسي نمط ج.

Introduction:

Regular blood transfusion in patients with hereditary hemolytic anemia, Particularly thalassemia, has improved their overall survival, but carries a definite risk of acquisition of blood-borne virus infections, especially viral hepatitis. Nowadays, vaccination against hepatitis B has efficiently been able to restrict the transmission of hepatitis B virus (HBV) infection. However, post transfusion transmission of hepatitis C virus (HCV) has still remained a major health concern in thalassemic patients. In addition, marked liver iron overload, which is often inevitable in patients on regular blood transfusion, and HCV infection have been shown to have a potentiating effect on hepatic fibrogenesis in thalassemic patients [1].

Chronic hepatitis C is a progressive disease that dramatically increases the morbidity and mortality rates among these patients due to liver failure or hepatocellular carcinoma [2].

hepatitis C virus is responsible for 80 – 90% of post transfusion hepatitis in patients who received blood transfusion prior to the introduction of routine blood products screening in 1990.[3]

Although the compulsory screening of donated bloods has decreased the incidence of both post transfusion HBV and HCV infections [4].

Due to the lack of sufficient reported data from Wassit governorate, this study conducted to provide a comprehensive data bank on the epidemiology of HBV and HCV infections in patients with β-thalassemia in wassit. Furthermore, tried to analyze HCV transmission-associated risk factors which allow the development of an effective policy to reduce the incidence of HCV infection in our thalassemic patients.

Patients and Methods:

Design of the study:

A cross sectional study (descriptive study) for Known cases of β-Thalassemia that had been transfused, as a part of their management was conducted starting between (October 2011 and April 2012) in Thalassemia Management Centre in Wassit governorate which receive all patients with thalassemia

The sample of the study:

A non probability (convenient) sample of patients with Thalassemia who have been diagnosed and treated by Thalassemia management Centre.

Inclusion criteria:

Known cases of β-Thalassemia that had been repeatedly transfused (conventionally every 20 or 40 days, as a part of their management) in Thalassemia Management Centre, at least ten units of blood, irrespective of their age, sex, and history of jaundice were included in this study.[5]

Exclusion criteria:

1. Patients who had been transfused less than 10 units of blood as a part of their management were not included in this study.
2. Patients who live outside Wassit governorate.

The study instrument:

Instrument was constructed through the questionnaire that prepared after review of the available literature. Face to face interview instead of self administrated questionnaire, because most patients had difficulty in reading.

Collection of Blood Samples: About three ml of patient's blood sample was collected by a clean venipuncture. The blood was allowed to clot. Serum was separated and stored at -20^{0} C till the test for HCV antibodies and HBsAg was performed in a batch.
Test for HCV antibodies and HBsAg was performed in duplicate for all the patients. The test was performed in batches of at least 10 cases, every time also running two negative and two positive controls, each in duplicate. A third generation ELISA kit was used for identification of HCV antibodies(IgM for acute cases). The instrument used called Human Lin ELISA Reader in public health laboratory in Wassit governorate.

Result :

The Laboratory test results for 326 serum samples of Thalassemic patients in Wassit governorate using ELISA test revealed that 2 (0.6%) of them were positive for hepatitis B surface antigen, 79 (24.2%) for hepatitis C virus, 324 (99.4%) were negative for hepatitis B surface antigen and 247 (75.8%) negative for hepatitis C virus As show in Figure (1)

The studied socio-demographic characteristics of β-Thalassemia patients were shown in table (1). The highest percentage of acute infection (17.2%) was found in ≤25 years old age group compared to 7.1% in the age group of >25 years old and this was a statistically significant. there was a significant association between the age of β-Thalassemia patients and the seropositive result p = (0.000).

Table(2) demonstrated the infection with hepatitis C virus in relation to type of thalassemia. The highest percentage (81.9 %) intermediate thalasemia patients out of those (17.8 %) positive for HCV antibody in comparison with (6.4 %) in thalassemia major and positive for HCV antibody, statistical significant association was found between HCV infection and type of thalassemia p= (0.024) as show in table (2)

The highly significant association demonstrated between the frequency of blood transfusion and HCV infection 52(16.0 %) blood transfusion every 20 day in comparison with 27(8.3) every 40 day p=(0.000) as show in table (3).

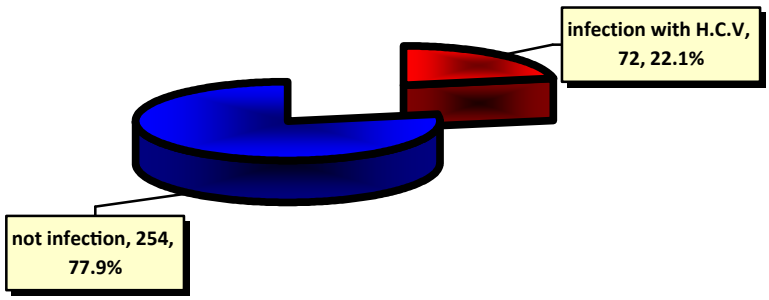

Figure (1): The seropositivity rates of (H.C.V.) by ELISA test among β-Thalasemia patients.

Table (1) Socio-demographic characteristic of β-thalassemia patient and association with hepatitis C virus

Socio-demographic		hepatitis C virus				Total		P. Value
		positive		negative				
		No.	%	No.	%	No.	%	
Age	≤25	56	17.2	223	68.4	279	85.6	0.000*
	>25	23	7.1	24	7.4	47	14.4	
Sex	Male	38	11.7	123	37.7	161	49.4	0.793
	Female	41	12.6	124	38.0	165	50.6	
Residence	Urban	52	16.0	162	49.7	214	65.6	0.969
	Rural	27	8.3	85	26.1	112	34.4	

*Significant using Chi-squared test at 0.05 level of significance

Table (2) Demonstrated the infection with HCV in relation to type of thalassemia.

Type of thalasemia	Positive HCV		negative		Total		P. Value
	No.	%	No.	%	No.	%	
Major	21	6.4	38	11.7	59	18.1	0.024*
Intermediate	58	17.8	209	64.1	267	81.9	
Total	79	24.2	247	75.8	326	100	

Table (3) Shows the association between frequency of blood transfusion and seropositivity for hepatitis C virus

Length of transfusion(days)	Diseases		Not Diseases		Total		P. Value
	No.	%	No.	%	No.	%	
Every 20 day	52	16.0	95	29.1	147	45.1	0.000*
Every 40 day	27	8.3	152	46.6	179	54.9	
Total	79	24.2	247	75.8	326	100	

Discussion:

The present study demonstrates 326 thalassemic patients from Wassit Governorate were investigated for screening of viral hepatitis B and C, 79 (24.2%) were hepatitis C virus infection and only 2 (0.6 %) were hepatitis B virus. The other studies from some neighboring countries reported an HCV infection rate of 19.3% in Iran[6], 4.5% in patients with thalassemia in Turkey [7]. While seropositivity rate was lower in the present study than that recorded by Al-Fuzae etal. (33%) in Kuwait [8] and Al-Mahroos etal.(1995) 40% in Bahrain [9]. This differences may be due to difference in assay system used to test for anti-HCV.

The number of seropositive thalassemia patients in the age group under 25 years old was significantly higher than the older age group p = (0.000). This result was in agreement with the result recorded by Hardik etal. in Gujarat west India found most of the patients with positive anti-HCV were 8-11 years old[10]. The reason of higher seropositivity may reflect the survival rate of thalassemic patients most of them (279) under 25 years old, While this result disagreed with that recorded in Islamic Republic of Iran, The highest rate of HCV positivity it can be related to the longer time of treatment and transfusion at a time when blood was unscreened [11].

The current study showed a higher percentage of seropositivity among females than males although there was no statistically significant association between seropositivity and sex of thalassemic patients these results were in agreement with the findings of Ahmad et al. in Iran who found most of the patients with positive anti-HCV were in females group (7.08 %) [12].

But disagreed with the result of Hardik et al. in India findings seropositivity among male more than females [10].

In the current study, there was no statistically significant association between seropositivity of HCV antibody and residence.The highest percentage (16%) of thalassemic patients were urban. While 27(8.3%) rural. These results were in agreement with the finding of amer et al. in Babylon Governorate-Iraq $p < 0.001$ [13].

A statistical significant association was found between HCV infection and type of thalassemic patients p= 0.024 these results were in agreement with that recorded in Pakistan $p < 0.001$ [14].But in disagreement with that recorded by Samimi-Rad etal. in Iran who found no significant association of infection with type of thalassemia [11]. The inconsistent may be due to different in sample size.

A strong significant association was found between frequency of blood transfusion and seropositivity to HCV p = 0.000 these results were in agreement with that recorded by Huma et al. in Pakistan who found a significant association between blood transfusion and HCV infection p = 0.001 [15]. We cannot exclude nosocomial transmission of the virus over time. However, these observations strongly indicated blood transfusion as the main risk factor for HCV infection.

Conclusion and recommendation:

The prevalence of HCV infection is much higher compared to HBV is that no vaccine is available so far for protection against HCV. Screening of Anti HCV Ab detection with highly sensitive and specific test for donated blood with improved technology like PCR should be introduced and regular screening of blood unit for HCV should be established.

Donor awareness program and providing a good questionnaire before transfusion can lead to self exclusion of high risk donors.

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