

PREVALENCE OF HEPATITIS C AMONG PATIENTS WITH BTHALASEMIA IN DIYALA- IRAQ ⁺

نسبة انتشار التهاب الكبد الفايروسي نوع سي بين مرضى الثلاسيميا في محافظة ديالى

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Abstract:

Background:

Hepatitis C infection is a worldwide problem, specially in polytransfused patients including those with Thalassemia. There is evidence that prevalence of HCV among thalassemic patients is high in Iraq ,but figures are conflicting . Prevalence and age distribution among such patients in Diyala governorate is unknown.

Objective:

The aim of this paper is to report the prevalence of hepatitis C among patients with thalassemia in Diyala Governorate / Iraq and relation to some individual factors among these patients .

Patients and methods:

110 thalassemic patients tested for anti hepatitis C Ab using third generation Elisza test and confirmatory immunoblot assays.

Results :

The prevalence of hepatitis C is 26.4%. Significant associations were found with male gender and young age group. Non significant relation was found with No. of transfusions per last year and with splenectomy.

Key words:

β Thalassemia , Hepatitis C virus (HCV) , Antihepatitis C antibody (AHC Ab), splenectomy.

المستخلص:

مرض التهاب الكبد الفايروسي مشكلة واسعة الانتشار في كافة ارجاء العالم خاصة لدى المرضى الذين يتطلب علاجهم نقل دم بصورة متكررة . هناك دلائل تشير الى سعة انتشار هذا المرض بين مرضى الثلاسيميا في العراق رغم ان الارقام متفاوتة من مكان الى اخر .

تهدف الدراسة الى معرفة انتشار هذا المرض بين المرضى المصابين بالثلاسيميا في محافظة ديالى .

تم شمول ١١٠ مريض من مرضى الثلاسيميا في هذه الدراسة حيث تم اجراء اختبار فحص ايليزا . الجيل الثالث على نماذج الدم المسحوبة و قد تم اجراء الفحوصات المختبرية التوكيدية اللازمة.

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كانت نسبة انتشار المرض طبقا لهذه الدراسة ٢٤,٤ % . كانت هناك علاقة ذات قيمة احصائية مع الذكور بينما اثبتت الدراسة ان نسبة انتشار المرض كانت عالية (بعلاقة ذات قيمة احصائية) في صغار العمر مقارنة بكبار العمر .

Introduction:

Hepatitis C (HC) was first detected in 1989 using molecular biology techniques after extensive testing of serum from experimentally infected animals[1]. Seroprevalence vary among populations according to their associated risk factors [2]. Before the introduction of screening of blood donors for hepatitis C virus (HCV), the risk of acquiring HCV infection as a result of transfusion was about 10% [3]. The risk of HCV transmission in USA is now about 0.001 % per unit transfusion .[4]

Multiply transfused patients for different causes are at high risk for HC[4]. Antipa showed in 1993 in Romania that 91.8% of polytransfused patients had antihepatitis C antibody (AHC Ab)[5]. In a group of multi-transfused children with varied diagnosis, from Delhi, India the prevalence of HCV was 26.6% according Agarwal etal in 1997 [6] .The prevalence of HCV antibody in haemophiliacs is around 23.9% in India[7] and (43.4%) in Iran[8].50-90% of injection drug abusers are chronically HCV infected[9]. Among injecting drug users, it was found that prevalence of hepatitis C virus was 72% in Glasgow[10] and 54.9%Egypt[11].

Significant findings was noted with patients receiving injections for kalazar in India where its found that 32.9% patients had anti-HCV antibodies[12] .

The overall prevalence rate among blood donors and whole population is 0.3% in Iraq [13] , 1.1 % in Yemen [14], 0.9% in children to 1.8% in adult blood donors in Saudi Arabia[15], 4.3% in Romania[5] and 4% of blood donors in Pakistan[16], 16-18% in Egypt [17] and 0.5% in Iran[18] . It has been estimated that the global prevalence is around 2%[19]. It seems that prevalence in Iraq is lower than other countries. The prevalence rate of hepatitis C infection is unknown among thalassemic patients in albatool Hospital at Diyala Governorate. Diyala province extends to the northeast of Baghdad as far as the Iranian border. It covers an area of 17,685 square kilometres .Population is 1,224,000.

The aim of our study is to study the prevalence of HC among thalassemic patients in the context of low prevalence rate among Iraqi donors and routine screen of blood which is started at 1996, furthermore the study is designed to determine the association of HC among thalassemics with some of personal factors .

Patients and methods:

Survey was conducted from the 1st January 1999 to the 31st Dec. 2000 in thalassemic unite at Al-battol Hpshpital in Diyala governorate / Iraq. The sample of the study consist of 110 thalassemic patiens diagnosed as β -thalassemia major and intermedia by Hb electrophoreses which represent all thalassemic patients registered at thalassemia center. Data sheet was designed for collection of information for patients enrolled in the study these information were age ,gender , No. of times blood needed /last year ,whether splenectomized or not , and virology test results .Bio ELIZA HCV third generation Elisza test for detection of AHC Ab in patient sera is used with confirmatory immunoblot assays for positive results.

Statistical methods used in analyzing and assessing results include:

1- Descriptive statistics inform of:

A- statistical tables included observed frequencies and percentages.

B- B- Contingency coefficient for the cross tabs (causes correlation ship of the contingency tables). C- Graphical presentations through using cluster bar charts.

- 2- Inferential statistics: in order to accept or reject statistical hypotheses they include: A- Fisher exact probability test (F.E.P) for testing the interaction (in dependency among 2 factors in the 2× 2 ranks of the contingency tables. B-- χ^2 -test for testing the interaction otherwise in the contingency tables C- testing the correlation of contingency coefficient B- Binomial test for testing coinfedency between 2 categories observed frequencies . Results are considered as highly significant at $P < 0.01$, significant results at $P < 0.05$ and non significant results at $P > 0.05$.

Results:

Table (1) : Observed Frequencies , Percentages and Cumulative Percent of Some related variables

Some related variables	Groups	Frequency	Percent	Cumulative Percent	C.S. P-value
Age Group	0 - 4	32	29.1	29.1	χ^2 -test P =0.000 HS(*)
	5 - 9	40	36.4	65.5	
	10 - 14	18	16.4	81.8	
	15 - 19	10	9.1	90.9	
	20 and more	10	9.1	100	
Gender	Male	65	59.1	59.1	B-test P=0.028 S
	Female	45	40.9	100	
Splenectomy	Yes	43	38.2	38.2	B-test P=0.070 NS
	No	67	61.8	100	
No of Blood Transfusions	5 - 9	19	17.3	17.3	χ^2 -test P =0.000 HS
	10 - 14	57	51.8	69.1	
	15 - 19	19	17.3	86.4	
	20 and more	15	13.6	100	

(*) HS (Highly Sig. at $P < 0.01$) , S (Sig. at $P < 0.05$) , NS (Non – Sig. at $P > 0.05$)

Table(1) shows some related demographic characteristics of the studied sample including age, gender, splenectomy and number of blood transfusions during last year .

Table(2) distribution according to gender

Gender	AHC +ve	%	AHC-ve	%	Total	%	C.S. P value
Male	22	20	43	30.1	65	59.1	F.E.P. P=0.026 (Sig.) C.C.=0.200 P=0.032 (Sig.)
Female	7	6.4	38	43.5	45	40.9	
Total	29	26.4	81	73.6	110	100	

The prevalence of hepatitis C is (29/110)26.4%. There is significant association with males (table 2)

Table 3 distribution of AHC positivity according to age

Age group (year)	No. Positive	%	No. Negative	%	Total	%	P value
0-4	3	2.7	29	26.4	32	29.1	$\chi^2=10.100$
5-9	15	13.6	25	22.7	40	36.4	P=0.039
10-14	6	5.5	12	10.9	18	16.4	(Sig.)
15-19	4	3.6	6	5.5	10	9.1	
20 and more	1	0.9	9	8.2	10	9.1	C.C.=0.290
Total	29	26.4	81	73.6	110	100	P=0.039 (Sig.)

Age groups significantly associated with AHC positivity. 13.6% of 5-9 years age group is positive for AHC Ab. .2.7%of 0-4years age group is positive for AHC Ab. (Table 3).

Table 4 Distribution of AHC positivity according to splenectomy

Splenectomy	No. AHC Positive	%	No. AHC Negative	%	Total	%	C.S. P- value
Yes	10	9.1	33	30	43	39.1	F.E.P.
No	19	17.3	48	43.6	67	60.9	P=0.403
Total	29	26.4	81	73.6	110	100	(Non-Sig.) C.C.=0.046 P=0.663 (Non-Sig.)

There is non significant association is found with splenectomy status (table 4).

Table 5 Distribution of AHC positivity according to No. of blood transfusions / last year

No. of blood transfusions / last year	No. Positive	%	No. Negative	%	Total	%	C.S. P- value
5-9	7	6.4	12	10.9	19	17.2	$\chi^2=5.062$
10-14	10	9.1	47	42.7	57	51.8	P=0.167
15-19	6	5.5	13	11.8	19	17.2	(Non-Sig.)
20 and more	6	5.5	9	8.2	15	13.6	C.C.=0.210
Total	29	26.4	81	73.6	110	100	P=0.167 (Non-Sig.)

There is no significant association with number of blood transfusions/ last year

Discussion:

High prevalence of HC encountered among thalassemic patients transfused before the 1990s the prevalence of HCV infection was shown to be proportional to the number of units of blood received, and approached 80% in the adult patients[20,21].

In developing countries acquisition of HCV infection is mainly nosocomial[22,23] as a sequel of low health care standards. While the major route of HCV infection in developed countries is through the use of intravenous drugs[24].

Prevalence of blood transfusion associated HCV infection is lowered in developed countries after implementing mandatory screening in 1990's[25], in Japan prevalence dropped from 4.9% to 1.9% after mandatory screening was introduced in 1990[25]. In US the prevalence dropped from 3.84% to 0.57% after the 1990 [26]. Still high rates encountered in many countries.

In India, mandatory screening for HCV was introduced as late as 2002.[27]

The prevalence rate of AHC Ab among multiply transfused patients ranges from 16.7%-68%[6,28-30].

In Iran where mandatory screening for AHC-Ab implemented in 1996. Prevalence AHC Ab among thalassemic patients ranges from 5.1% to 63.8% according to different studies [8,18,31,32] and (19.3%) in multicenter study[33].

The prevalence rate among multiply transfused patients is around 40% in Jordan and in Saudi Arabia [34,35], 4.5%-14% in Turkey[36,37], 17% in Taiwan [29], 10% in Sri Lanka [38], 41.7% in Pakistan[39], 20.2% in Thailand[40], 22.4% in Malaysia[41], 54.2 in Greece [42] and 47% in Italy[43].

Prevalence of AHC positivity among thalassemic patients in Iraq ranges from 10% to 67.3% according to different studies [13]. HCV-specific antibodies were detected in 67.3% among thalassemic patients in Ibn Al Balady hospital, Baghdad[44]. In another study done at the same hospital the prevalence is 37.6%[13]. The prevalence is 30% in Mosul, and 10% Thiqr[13]. Salwa Shalash, Tareef Fadhil and Dawood Salman report that among siblings with thalassemia in 13 families in Diyala which have more than one sibling with thalassemia, the prevalence rate is 82.8% this indicates the disease is clustering in families [45].

Many studies report association of HCV in thalassemic patients with older age groups[11,20,21]. In Greece a study published in 2008 showed that prevalence rate among thalassemics for HCV was 54% and suggest that infection in older age groups denotes previous infection before screening [42]. Similar suggestion have been made by Jaiswal *et al* in 2001 [30] in India. Furthermore AHC Ab in Ahmad Tamaddon's study (published in 2006) reported to be negative for all young patients received only screened blood in Iran after 1996[32], positive results being noticed among those who were receiving non screened blood.

We suggest serial studies for incidence rates of AHC Ab positivity in thalassemic patients to confirm this aspect and to see the exact time of seroconversion, in our study here high prevalence of AHC Ab positivity in younger age group leads us to think about other modes of infection other than blood transfusions providing that the blood is screened routinely, specially in the presence of low donor rate in Iraq. This is consistent with study done in Mosul which shows high prevalence among younger age group[13] and with another study done in Diyala[45].

Number of blood transfusions is related to HCV infection in many studies.[8,18,20,21,32,37,43], while it is not related in a study done in Thailand published in 2003 [40].

We did not consider the total number of transfused times during whole illness and consider the number of pints / last year instead, because difficulty to obtain data in older patients before their registration at thalassemia clinic.

Non significant association of splenectomy with prevalence of HCV in this study in contrary to Sammi-Rad's study [8]. Really splenectomy reduces transfusion requirements in thalassemic patients who have history of increased requirements for blood transfusions and hypersplenism[46-48]. Non significant association in this study might be related to high prevalence among young groups in contrary to other studies.

Males are associated with increase prevalence of HCV in this study and in another study don in Diyala[45] while Females have higher prevalence in Ahmad Tamaddoni's study[32]. Males and females are similarly affected according to Ansar MM's study[18].

Conclusions and recommendations:

Prevalence of HCV infection is high in spite of screening program and low donor prevalence .Higher prevalence is found among young age groups. Further steps are needed to reduce the prevalence of HC among thalassemic patients .

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