

Complications of HBV, HCV and HIV Infections in Patients with Cooley Anemia in Baghdad

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Abstract :

This study was carried out to evaluate some virological parameters: hepatitis B surface antigen (HBS Ag), Anti-hepatitis C virus antibody (Anti-HCV Ab.) and Human immunodeficiency virus (HIV) in β -Thalassemia. Those were analyzed in the period from first of October 2010 to May 2011. The study included: 200 patients with β -Thalassemia referred to the Ibn-AlBalady hospital center and Al-Karamh Hospital Center, 100 patients from each center and 50 cases of children infected with other mild diseases as a control for β -Thalassemia group from those attending the General Pediatric Hospital). Most of Thalassemic patients were distributed between (2–35) years of age. In this study we found that the Enzyme linked Immuno-Sorbent Assay (ELISA) test showed that 2.5% of Thalassemia patients were infected with hepatitis B, 21% of them had hepatitis C virus infection. On the other side the patients showed negative results for HIV.

Key word: HBV, β thalassemia, Anti HCV Ab

Introduction:

Beta-Thalassemias are a group of hereditary blood disorders characterized by anomalies in the synthesis of the beta chains of hemoglobin resulting in variable phenotypes ranging from severe to a large number of bacteria, viruses and parasites are capable of being transmitted through blood (Renzo Galanello and Raffaella Origa, 2010). The most serious result from pathogenic viruses, particularly those causing hepatitis B (HBV), hepatitis C (HCV) and AIDS (HIV) (Renzo Galanello and Raffaella Origa, 2010; Ahmad S, et al., 2002). Screening blood for these viruses by sensitive tests like ELISA is mandatory in Iraq. Only blood tested non-reactive by the screening tests can be transfused to patients (Ahmed M., 2001). Such testing has tended to create a false sense of security regarding the safety of the blood supply; the common misperception being that blood that has been screened non-reactive for HBV, HCV & HIV is free of these infections. Anemia to clinically asymptomatic individuals (Barker, L. F., et al., 1996).

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Metarials and Methods:

A. PATIENTS STUDY GROUP:

Two hundred patients with β -Thalassemia (major) consisting of a hundred patients admitted to Thalassemia center in Ibn-Al-Balady hospital for blood transfusion (referring to Al-Resafa district) and a hundred patients admitted to Thalassemia center in AL-Karamh hospital for blood transfusion (refer to Al-Kerkh district).

B. CONTROL GROUP:

Fifty children with age and sex matched to the patients were selected as controls for Beta Thalassemia group. Those subjected attended the hospital for minor surgery or personnel from laboratory or medical technology students. All the controls were apparently in good health, Non had taken any medication for at least 1 month. Using ELISA, their sera were tested for HBs Ag, HCV Ab, and HIV Ab.

Results and Discussion :

- The Prevalence of Hepatitis B Surface Antigen (HBS Ag) positive cases in Thalassemias study population by ELISA Technique.

Table (1) monitor the Thalassemias patients examined by Elisa techniques for Hepatitis B Surface Antigen. It showed positive results in (3/100) of Ebn Al Beledy and (2/100) of Al-Karama, while (195/200) of the patients were found to be negative. On the other hand the control group showed negative results for HBS Ag. No significant differences were obtained (1).

Table (4-1):Prevalence of Hepatitis B Surface Antigen (HBS Ag)positive cases in Thalassemias study population by ELISA Technique

Group	No.	HBS +ve		HBS -ve	
		No.	%	No.	%
Ebn Al Beledy	100	3	3	97	97
Al-Karama	100	2	2	98	98
Control	50	0	0	50	100
Total	250	5	2	245	98

Chi-sq=1.531, Df=1.0 , P-value= 0.216 (N.S) of Ebn Al Beledy
 Chi-sq=1.014, Df=1.0 of Al-Karama (N.S)

- The Prevalence of Anti- Hepatitis C virus Antibody (Anti HCV Ab) positive cases in Thalassemia study population by ELISA Technique

Hepatitis C virus was detected in the Thalassemias study population by ELISA Technique as presented in table (4-3) which showed that (20/100) of Ebn Al Beledy & (22/100)

of Al-Karama hospital were found to be positive for Anti-HCV antibodies .The control group were found to be negative for (Anti HCV Ab) with significant differences (P=0.001) in Ebn Al Beledy Hospital cases and highly significant differences (P=0.000) in Al-Karama Hospital cases.

Table (4-3): Prevalence of Anti- Hepatitis C virus Antibody (Anti HCVAb) positive cases in Thalassemia study population by ELISA Technique

Group	No.	Anti- HCV +ve		Anti-HCV -ve		Chi-sq	D.F
		No.	%	No.	%		
Ebn Al Beledy	100	20	20	80	80	11.538	1
Al-Karama	100	22	22	78	78	12.891	1
Control	50	0	0	50	100		
Total	250	42	16.8	208	83.2		

P-value=0.001 (S) of Ebn Al Beledy with control
 P-value=0.000 (H.S) of Al-Karama with control

-Prevalence of Human Immunodeficiency virus (HIV) positive cases in Thalassemias study population by ELISA Technique

In order to determine the prevalence of Human Immuno-

deficiency virus in Thalassemia patients and control group, we used ELISA tests and found that non of the cases and control group showed positive results as presented in table below.

Table (4-6): Prevalence of Human Immunodeficiency virus (HIV) positive cases in Thalassemias study population by ELISA Technique

Group	No.	HIV +ve ELISA		HIV -ve ELISA	
		No.	%	No.	%
Ebn Al Beledy	100	0	0	100	100
Al-Karama	100	0	0	100	100
Control	50	0	0	100	100
Total	250	0		250	
P-value (N.S)					

-Prevalence of HBS,HCV and HIV among β -thalassemia patients:

Detection of hepatitis B virus (HBV) has reported that the reasons for hepatitis B virus prevalence in multi-transfusion case included :

- The dose of HBV required to infect an individual is probably less by a hundred times (or more) than the detection level of the most sensitive screening test.
- Certain variants of HBV do not produce the commonly detected marker for HBV ; such as blood would be wrongly labeled non-reactive.
- During the normal course of hepatitis B infection, HBsAg levels rise initially, but fall within 1-3 weeks to undetectable levels, yet the person continues to be infectious.
- Every test procedure has a certain number of false positive and false negative results.
- Inadvertent technical errors, equipment malfunction and erratic electric supply can all affect the accuracy of the test (Nvhpc, 2005).

Detection of hepatitis C virus (HCV) was considered the marker of chronic HCV infection . Assuming that screened blood is infection free presupposes that no other infections exist and so can be transmitted by blood. Screening blood for infections is possible, only where the infectious agent has been identified and a detection system is available. The existence of a hepatitis virus, distinct from HBV, was suspected for many years, but a screening test for HCV became available only in 1989. We are also aware that new viruses regularly make their appearance, as was with HIV. That is why a carefully screened voluntary donor, who answers all medical queries honestly and is non-reactive to the available screening tests, preferably on more than one occasion, is the best defense against blood transfusion infection (Nvhpc, 2005).

Very high prevalence rates of HBV and HCV in multi-transfused populations are due to blood transfusions, but limited data are available about the practices of blood banks. In Iraq blood banks regularly utilized paid blood donors and actively recruited voluntary blood donors. In another study in Pakistan, (2001), Ahmed reported a higher prevalence of HBV in professional blood donors as compared to voluntary blood donors (Ahmed .,2001;Ahmad et

al.,2002). Also Neumayr et al.,(2011) have reported that during the last few years, some shifts in the epidemiological patterns of HCV transmission have been observed. In the past, transfusion of blood and blood products was the classical source of infection. The source of infection is unknown in 30–40% of all HCV infections(Neumayr et al.,2011). Vera de Leon et al .,(2005) had found that in the north of Mexico, the main route of transmission was blood transfusion and there is a marked decrease in the incidence of post-transfusion hepatitis since the introduction of anti-HCV antibody screening of blood donors (4.5%). Intravenous drugs use is now an important route of transmission (Vera de Leon et al .,2005).

Donated blood is tested by many methods, but the core tests recommended by the World Health Organization are these four:

- Hepatitis B virus
- Hepatitis C virus
- HIV, usually subtypes 1 and 2
- Serologic test for Syphilis

The WHO reported in 2006 that 56 out of 124 countries surveyed did not use these basic tests on all blood donations (WHO., 2010).

Our results on the prevalence of HIV infection in Thalassemic patients showed no compatibility with the results reported in India which found that (8.9%)of the Thalassemia patients were found to be positive for HIV infection (Sens et al ., 1993), while in Bahrain it was made (1.6%) in multitransfused subjects (Al-Mahroos.,1995). This fact revealed that fortunately, for the time being, HIV infection is not a health concern for Thalassemia population in Baghdad . This may be due to the relatively low prevalence of HIV infection in Baghdad, as well as the fact that all donors are screened for HIV infection.

Blood- borne illnesses like hepatitis and HIV are transmitted sporadically or in micro-epidemics. These micro-epidemics may account for the wide variations in prevalence seen within a nation, a province, or even a community. Identification of the causes of these micro-epidemics provides an opportunity to limit the transmission of these diseases. However, methodological differences in sampling strategies may also contribute to differences in seropre-

alence within similar regions or populations (Oklahoma, and Nebraska.,2003).

(Nvhpc, 2005) had reported that a large number of bacteria, viruses and parasites were capable of being transmitted through blood. The most serious ones result from pathogenic viruses, particularly those causing hepatitis B (HBV), hepatitis C (HCV) and AIDS (HIV). Screening blood for these viruses by sensitive tests like PCR is only blood tested non-reactive by the screening tests can be transfused to patients. Such testing has tended to create a false sense of security regarding the safety of the blood supply; the common misperception being that blood that has been screened non-reactive for HBV, HCV & HIV is free of these infections.

A study justifies the statement that "in any country, as the proportion of the population with infectious diseases (such as HIV and hepatitis) increases, the proportion of the population who are eligible to donate blood falls. The need for more low-risk, voluntary non-remunerated blood donors

becomes even greater (WBDD, 2011). Gilson et al.,(2007) believe that the co-infection of HIV and HBV may increase the expression of HBsAb and DNA polymerase activity in liver cells viral reproduction as well as ALT and AKP in serum.

In Pakistan Luby et al.(2006) studied 24 randomly selected blood banks in Karachi in 1995 and found that fifty percent of blood banks regularly utilized paid blood donors and only 25% actively recruited voluntary blood donors. Also it was found that 95% had reagents and equipment to test for HBV, only 55% could screen for HIV and 23% for HCV.

Conclusion:

The prevalence of HCV infection is much higher among Baghdad beta-thalassemic patients as compared with HBV and HIV infections. Routine screening of donated blood for HCV is highly recommended.

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مضاعفات التهاب الكبد الفيروسي نوع C , B والأيدز (HIV) لدى المرضى المصابين بفقر دم البحر الأبيض المتوسط في بغداد

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الخلاصة:

تم تبني هذه الدراسة لغرض تقييم الحالة السريرية والسمات الفيروسية (فيروس التهاب الكبد فط ب, ج وفيروس العوز المناعي HIV) لدى المرضى العراقيين المصابين بفقر دم البحر الأبيض المتوسط (الثلاسيميا الكبرى) للفترة من الأول من أيلول 2010 ولغاية الثلاثين من ميس 2011. ولقد استخدمت تقنية الـ ELISA والـ PCR للكشف عن الفيروس.

شملت الدراسة 200 مريض مصاب بفقر دم البحر الأبيض المتوسط فط الكبير , 100 مريض من المراجعين لمركز الثلاسيميا في مستشفى ابن البلدي , 100 مريض من المراجعين لمركز الثلاسيميا في مستشفى الكرامة. لقد كان معدل الأعمار لمرضى فقر الدم البحر الأبيض المتوسط 2 - 35 سنة. كما وشملت الدراسة (50) من الأطفال المصابين بأمراض بسيطة مختلفة غير الثلاسيميا من مستشفى الطفل المركزي كمجموعة سيطرة لمرضى الثلاسيميا . وقد تبين من النتائج أن 2.5% من مرضى فقر الدم الأبيض المتوسط (فط الكبير) كانوا مصابين بالتهاب الكبد الفيروسي فط (ب) , 21% منهم كانوا مصابين بالتهاب الكبد الفيروسي فط (ج) , بينما كان فحص العوز المناعي قد أعطي نتيجة سالبة لجميع مرضى فقر الدم البحر الأبيض المتوسط. وقد وجدنا أن العوامل الآتية لها أهمية بالغة في حدوث التهاب الكبد الفيروسي لدى مرضى فقر الدم البحر الأبيض المتوسط (فط الكبير) وهذه العوامل هي : التقدم بالعمر, رفع الطحال و عدد تكرار نقل الدم خلال فترة المرض . في حين أن الجنس وصنف الدم ليس لهم دور أو أهمية في حدوث الالتهاب .برنامج التحصين ضد التهاب الكبد الفيروسي كان ذو فعالية في تقليل حدوث الالتهاب بالفيروس .