Seroprevalence of Hepatitis B and C among Blood Donors in Babylon Governorate-Iraq

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Abstract

A cross-sectional study of 23336 blood donors in Babylon Governorate – Iraq was done during the period from February 2007 to February 2008 . The study revealed that 23122 cases were males (99.1 %), while 214 were female (0.9 %) . All the donors has been investigated for HBS Ag (Hepatitis B surface Antigen) and Anti – Hepatitis C Virus antibodies (Anti – HCV ab) (ELISA test) .287 of the total sample (1.2 %) found to be seropositive for either HBs Ag and Anti – HCV ab (274 were males 95.5 % and 13 were females (4.5 %) .

The number of HBs Ag seropositive cases were 171 (59.6 %) while the number of seropositive of Anti – HCV ab were 116 (40.4 %). The seroprevalence of Hepatitis B virus infection among male donors was (0.7 %) and for female donors was (4.7 %) , while the seroprevalence of HCV infection among male donors was (0.5 %) and for female donors was (1.4%) .

The overall seroprevalence of HBs Ag among blood donors in Babylon governorate is (0.7 %) and for Anti – HCV ab is (0.5 %) and these results are parallel or relatively low if they were compared with some other Iraqi Governorates and some other countries .

الخلاصة

تم إجراء دراسة مقطعية لسجلات متبرعي الدم من مراجعي مصرف الدم المركزي في محافظة بابل للفترة من شباط 2007 إلى شباط 2008 . كان عدد المتبرعين الكلي (من سكنة محافظة بابل) خلال تلك الفترة (23336) متبرع ، (23122) ذكراً (99, 1 %) و(214) أنثى (0,9 %) . تم فحص جميع المتبرعين للتأكد من وجود إصابات التهاب الكبد الفايروسي نوع (B) و(C) .

أظهرت الدراسة ان عدد الإصابات الكلي هو287 (1.2 %) ، عدد الذكور المصابين 274 (95.5 %) وعدد الإناث المصابات كان 13 (4.5 %) .

بين الفحص بأن عدد المصابين بالتهاب الكبد الفايروسي نوع (B) كان (171) إصابة ، وعدد المصابين بالتهاب الكبد الفايروسي نوع (C) كان (116) إصابة ، كما تبين أن معدل انتشار التهاب الكبد الفايروسي نوع (B) بين متبرعي الدم في محافظة بابل من الذكور (0.7 %) والإناث (4.7 %) ، أما معدل انتشار التهاب الكبد الفايروسي نوع (C) فكان (0.5 %) للذكور و(1.4 %) للإناث.

أظهرت الدراسة أن المعدل الكلي لانتشار التهاب الكبد الفايروسي نوع (B) و(C) لمتبرعي الدم في المحافظة وخلال تلك الفترة هو (0.7 %) و(0.5 %) على الترتيب ، وهذه النتائج هي موازية أو منخفضة نسبياً إذا ما قورنت بمثيلاتها في بعض المحافظات المجاورة وبعض الدول الأخرى .

Introduction

Viral hepatitis B and C are a worldwide public health problem, representing a significant cause of morbidity and mortality especially in developing countries. It is estimated that 350 million people worldwide are chronic HBV carriers, representing approximately 7% of the total population [1]. Hepatitis C virus infection is found in approximately 3 % of the world population, accounting for 160 million people [2].

Their transmission occurs, mainly, through direct contact with blood, intravenous injection , blood transfusion and / or transfusion of hemo – components, and sexual relations , this last , mainly in HBV carriers [3]. In HCV carriers, the sexual transmission is controversial [4].

Chronic hepatitis B infection is prevalent in Southeast Asia , China and Africa , where over 10 % of the population may be infected. In Western Europe and North America, hepatitis B affects less than 1 % of the population, although more than 1 million people in the United States are chronically infected [5].

Viral hepatitis is an endemic disease in Iraq , it attributes to relevant problems and all types of the known causative agents are existing in this locality with various rates of infection .[11]

HBs Ag is a reliable marker for hepatitis B infection and HBs Ag negative test makes hepatitis B infection very unlikely, but not impossible [6]. It appears in the blood late in the incubation period and before the prodromal phase of acute type B viral hepatitis . It may be present for only few days disappearing even before the jaundice has developed , but it usually lasts for 3 – 4 weeks and may persist for up to 3 months . Antibodies to HBs Ag (anti- HBs) usually appear 3 months and persist years or permanently [7].

Hepatitis B core antigen (HB c Ag) is not found in the blood but its antibodies (anti – HB c) appear early in acute hepatitis B and rapidly reach higher titer which is initially IgM antibodies while IgG antibodies appear late and persist . Anti – HB c (IgM) can sometimes reveal an acute infection of hepatitis B when HB s ag has disappeared and before (anti–HBs)has developed [8].

Post transfusion hepatitis B can be prevented by screening of donors units for HB s Ag , but this test does not exclude all blood units which are infected by hepatitis B . Additional methods are used to ensure safety of supply by confirmatory tests such as polymerase chain reaction (PCR) methods for diagnosis .

For screening of hepatitis C virus infection (HCV) , second and third generations of enzymes immunoassays for hepatitis C antibodies (anti – HCV) are used as the most special screening tests [9]. Confirmatory tests should only be when there is orderline results by HCV enzyme immunoassays [10]. Hepatitis C infection that occurs after blood transfusion is less severe in acute phase than hepatitis B , and is more likely to be anicteric , but about 50 % of cases transfer to chronic liver disease [11] .

The aim of the study is to estimate the prevalence of HB s Ag and anti – HCV seropositive blood donors in Babylon Governorate and compare the results with other Iraqi Governorates and other countries.

Materials and Methods

A cross – sectional study was done in Babylon Governorate – Iraq , 23336 donors attended for blood donation during the period (February 2007 - February 2008) to the central blood bank at Al – Hilla General Teaching Hospital – Babylon . All the donors had been investigated for the presence of HBs Ag and anti – HCV antibodies (screening test by ELISA) .

This study depends on the records (archives) available in this blood bank, and these records are:

(1) Donors records which involve name, age, sex, and address.
(2) Blood groups and Rh records.
(3) Virology records, this involves all the infected donors by hepatitis B and C viruses.

Statistical analysis : Chi-square test was applied.

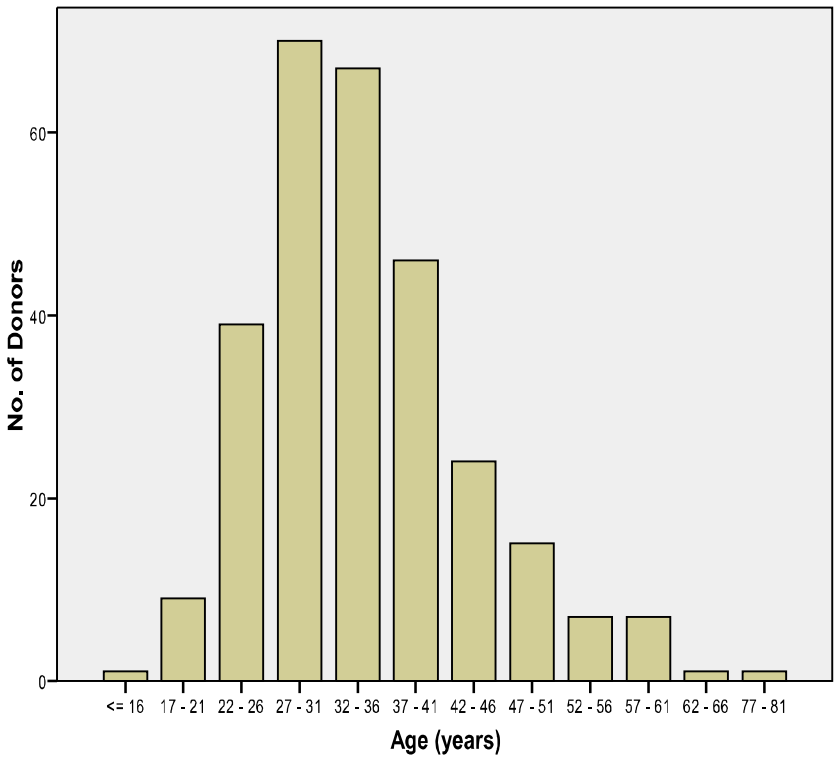
Results and Discussion

23336 blood donors from Babylon Governorate were investigated for screening of viral hepatitis B and C . 23122 (99.1 %)were males and only 214 (0.9 %) were females . Only 287 donors (1.2%) were infected with the hepatitis(B or C), 274(95.5%) males and 13(4.5%) females .The mean age of infected donors was 34.76 years old and the higher frequency rate appear at age groups (26 - 30)and (31 – 35) years (table and figure 1). The analysis of data reveal that there is no relationship between hepatitis infections and age ($p > 0.05$) .The number of HBs Ag seropositive blood donors was 171 with prevalence of (0.7 %) , from these (161 males and 10 females), while the number of Anti – HCV seropositive blood donors was 116 (113 males and 3 females) with prevalence of (0.5 %) . This result shows no significant relationship between hepatitis infection and sex ($p > 0.05$) (table 2) .

The study shows that there is a relationship between viral hepatitis infections and residence (rural and urban), ($p < 0.001$) (table 3) as well as there is a relationship between the seropositive cases and distribution of the infected persons at the different districts of Babylon Governorate ($p < 0.01$)(table 4),This table also shows a significant difference between types of hepatitis in Al-Hilla and Mahaweel districts.

The study showed that there is no relationship between blood groups and hepatitis infection ($p > 0.05$) (table 5), as well as between months and the number of cases during each month ($p > 0.05$) (table 6) , but there was a significant difference between types of hepatitis in March, April, and December ($P<0.05$).

The current study showed that the prevalence of HBs Ag seropositive of blood donors in Babylon governorate was (0.7%) which is nearly similar to Najaf governorate (0.66%) and lower than that in Kerbala (3.5%) [11]. In comparison with some Arabic, Asian, and African countries , it was lower than in U.A.E (0.88%) [12], Egypt (1.3%) [13], Pakistan (6.2%) [14] and Tanzania (8.8%) [15]. Also this study showed that the prevalence of anti HCV seropositive of blood donors was (0.5%) which is relatively low in comparison with U.A.E (0.6%) [12] , Egypt (4.04%) (13) , Pakistan (7.5%) (14) and Tanzania (1.5%) (15). The higher rate of infection appeared at the two age groups (26 – 30) and (31 – 35) years ,which included the younger persons who were ready for donation . This increment of infection at this age group may reflect the transmission of hepatitis infection during sexual activities [4].



Figure(1) Frequency Distribution of Hepatitis Disease among Age

Table 1 Frequency Distribution of Disease among Age groups during (Feb. 2007- Feb. 2008)

Age (Years)	Disease	
	Hepatitis B	Hepatitis C
16 – 20	3	5
21 – 25	20	14
26 – 30	40	27
31 – 35	39	33
36 – 40	30	17
41 – 45	15	7
46 – 50	11	5
51 – 55	7	5
56 – 60	5	1
61 – 65	1	1
66 – 70	0	0
71 – 75	0	0
76 – 80	0	1
Total	171	116

Table 2 The Frequency Distribution of Hepatitis B & C infections Among Sex (Feb. 2007 – Feb. 2008)

Sex	Disease				Total	P value
	Hepatitis B		Hepatitis C			
	No.	%	No.	%		
Female	10	5.8	3	2.6	13	
Male	161	94.2	113	97.4	274	p > 0.05
Total	171	100%	116	100%	287	

Table 3 The Frequency Distribution of Hepatitis infection Among Residence

Residence	Disease				Total	P value
	Hepatitis B		Hepatitis C			
	No.	%	No.	%		
Rural	64	37.4	24	20.7	88	
Urban	107	62.6	92	79.3	199	p < 0.001
Total	171		116		287	

Table 4 The Frequency Distribution of Hepatitis infection Among Districts of Babylon Governorate

county	Disease		Total	P value
	Hepatitis B	Hepatitis C		
Hilla	70(40.9%)	74(63.8%)	144	< 0.001
Hashemya	36(21.1%)	16(13.8%)	52	>0.05
Mahaweel	39(22.8%)	15(12.9%)	54	< 0.05
Musayeb	26(15.2%)	11(17.7%)	37	>0.05
Total	171	116	287	

Table 5 Frequency Distribution of Disease among Blood Groups

ABO & Rh Phenotype	Disease	
	HBs	HCV
A-	6	3
A+	50	23
AB-	2	1
AB+	10	11
B-	5	5
B+	39	20
O-	1	0
O+	58	53
Total	171	116

Table 6 Frequency Distribution of Hepatitis among Months

Month	Disease					Total	
	HBs		HCV		P value		
	No.	%	No.	%		No.	%
February	19	11.11	7	6.03	>0.05	26	9.06
March	14	8.20	2	1.72	<0.05	16	5.57
April	17	9.94	21	18.10	<0.05	38	13.24
May	11	6.43	10	8.62	>0.05	21	7.32
June	13	7.60	10	8.62	>0.05	23	8.01
July	15	8.77	11	9.48	>0.05	26	9.06
August	15	8.77	7	6.03	>0.05	22	7.66
September	10	5.84	7	6.03	>0.05	17	5.92
October	13	7.60	8	6.89	>0.05	21	7.32
November	10	5.84	9	7.75	>0.05	19	6.62
December	4	2.33	10	8.62	<0.05	14	4.87
January #	17	9.94	9	7.75	>0.05	26	9.06
February #	13	7.60	5	4.31	>0.05	18	6.27
Total	171	100	116	100		287	100

Correlation Coefficient (r) = 0.39 , ($p > 0.05$) # Year 2008

Non significance (P>0.05), Significance (P<0.05).

Conclusions

1).The sero prevalence of HBs ag 0.7 % and anti – HCV 0.5 % positive of blood donors which is nearly equal or relatively low in Babylon Governorate at the time of the study in comparison with other areas of Iraq and some other Arabic , Asian and African countries .

2). Males are still the main blood donors in both urban and rural areas .

3). Hepatitis B and C infection by ELISA assay are present allover the year and there is no significant relationship between distribution of the disease with months ($p > 0.05$) with some increase in rate of positive cases during March, April and December months .

4). The current study showed that there was a wide range of age groups of blood donors (16 - 77) years , and this range should be limited according to certain criteria of blood donation .

5). HBs ag rate of infection was higher than HCV infection of blood donors in this locality , with no significant relationship ($p > 0.05$) .

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