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Seropositivity of Hepatitis B, Hepatitis C, HIV and VDRL Infections Among Blood Donors in General Kirkuk Hospital

Kerkük Devlet Hastanesinde Kan Donörleri Arasında Hepatit B, Hepatit C, HIV ve VDRL Seropozitifliği

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Abstract
Objectives: Alarming seropositivity rates for Hepatitis B and C are reported in Kirkuk city.Transfusion of contaminated blood is an important cause of Hepatitis B and C spread in this region. The aim of this study was to determine the seroprevalance of Hepatitis B, Hepatitis C, HIV and VDRL among healthy blood donors in central blood bank in Kirkuk and to determine whether the trend of seropositivity is on the decline as indicated by previous studies. We acknowledge all the staff members of blood bank unit in General Kirkuk Hospital for their technical support during data collection.
Materials and Methods: This cross sectional study is an analysis of database at central blood bank in General Kirkuk Hospital from1st September 2012 to 30th March 2013 .It was carried out on 1000 blood donors selected randomly, irrespective of gender. The patients' age ranged from 18-65 years.
Results: Of the 1000 donors selected randomly, it was reported that seroprevalance of Hepatitis C, Hepatitis B and VDRL was respectively; 0.40%, 1.6%, and 1.90%. No case of HIV was reported in this study.
Conclusion: It is recommended that blood should be screened properly by most recent techniques prior to transfusion to the patients.
Key Words: Blood transfusion, blood donors, Hepatitis B, Hepatitis C, VDRL

Öz
Amaç: Hepatit B ve C için Kerkük'te yüksek oranlar rapor edilmektedir. Bu bölgede kontamine kanın transfüzyonu Hepatit B ve Hepatit C'nin yayılmasında önemli bir etkendir. Bu çalışmanın amacı, Kerkük merkez kan bankasında sağlıklı donörler arasında Hepatit B, Hepatit C, HIV ve VDRL seroprevalansını ve önceki çalışmalarda nakledildiği gibi düşüşe geçip geçmediğini araştırmaktır.
Materyal ve Metot: Bu çapraz kesitsel çalışma 1 Eylül 2012 ile 30 Mart 2013 arasında Kerkük Devlet Hastanesi merkezi kan bankası veri tabanının analizi şeklinde, cinsiyet farkı gözetmeden, rastgele seçilen 18-65 yaş arası 1000 donör üzerinde planlanmıştır.
Bulgular: Seçilen 1000 donörden Hepatit C, Hepatit B ve VDRL prevalansı sırasıyla % 0.40, 1.60 ve 1.90 idi. Bu çalışmada HIV bulgusuna rastlanmamıştır.
Sonuç: Hastalara transfüzyon yapılmadan önce kan numunesi en son tekniklerle taranmalıdır.
Anahtar Kelimeler: Kan transfüzyonu, kan donörleri, Hepatit B, Hepatit C, VDRL

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Introduction

Viral hepatitis is a major public health problem worldwide. Different viruses including Hepatitis A, B, C and E cause viral infections of human liver. Hepatitis A and E viruses are transmitted by feco-oral route[1,2]

Hepatitis B (HBV) and Hepatitis C (HCV) are two hepatotrophic blood borne viruses (BBVs), that are important causes of liver related mortality and morbidity. They have usually similar modes of transmission, by parenteral, sexual and perinatal modes. As the clinical picture for both infections are varied and chronic asymptomatic carriage can

occur, the initial diagnosis of infection is generally made by the detection of a serological marker, the hepatitis B surface antigen (HbsAg) for HBV and anti-HCV antibodies for HCV in both symptomatic and asymptomatic patients.[3]

WHO estimates that approximately 2 billion people are infected by HBV in the world and that 350 million are chronic HBV carriers. Each year 4 million acute clinical cases are seen in the world and 25% of these become carrier potential sources of infection. One million people die every year due to chronic active hepatitis, cirrhosis, or primary liver carcinoma. WHO estimates that 3% of world population has HCV infection. There are 4 million carriers in Europe.[4]

Risk factors include unprotected sexual contact with an infected person, especially among people with multiple sex partners or men who have sex with men (MSM), contact with contaminated needles, especially injection drug equipment. Other items such as tattoo and body piercing instruments, razors, and toothbrushes may be contaminated with infected blood and occupational exposure through accidental needle stick is also a common cause.[5]

Syphilis is more common in developing countries where prevalence can reach 25% among blood donors. An infected person can transmit syphilis through infected blood products, i.e through blood transfusion or the use of infected needles.[6]

Co-infection with hepatitis among people with HIV is emerging as a growing problem. For people infected with HIV through needle exposure probably due to drug use, 40% or more may also have Hepatitis C.[7]

Blood transfusion may itself result in complications which include transmitting several infections like HIV, Hepatitis B, Hepatitis C and Syphilis. A proper screening of the donor is important and mandatory to prevent these infections so that the blood transfusion does not harm the patient. The risk of transmitting these infections can be effectively reduced by accurately screening the donor for these infections.[8]

The present study was carried out to estimate the distribution of Hepatitis B, Hepatitis C, HIV and VDRL (+) cases in blood donors in central blood bank in Kirkuk city and determination its risk factors.

Materials and Methods

A cross-sectional study was conducted at the central blood bank in General Kirkuk Hospital. This unit receives blood donations from general population.[9]

This study was conducted at the central blood bank in Kirkuk General Hospital from 1st September 2012 to 30th March 2013. During this period, all donated samples (n=1000) of 18-65 years old donors were tested for HBV, HCV, HIV and VDRL. Each donor's serum sample was screened for HIV infection by ELISA technique. Sera were checked for the presence of hepatitis B surface antigen (HBsAg) using ELISA. For screening of syphilis, serum from all donors was tested for the presence of treponemal antibodies using rapid plasma regain test (RPR).[10]

A confirmatory test was performed on blood when it was found to be reactive. The same serum sample was studied again using the same method. If the repeated result was negative, a third test was performed when the result came out to be negative at 2 consecutive tests; the result was accepted as negative. When the repeated result was reactive again, it was accepted as reactive. Reactive results were also reported to the provincial directorate of health and the individual were informed and were referred to the infectious disease clinic.[11]

A structured questionnaire was designed to be used to gather data regarding demographic and socioeconomic attributes; such as, city of birth, age, blood type, address, sex, education, profession, marital status, and various parenteral exposures to blood or blood products, contact history with index case, donation history in the last 2 or 3 months, vaccines, dental interventions, medical care in the last year, history of chronic diseases, transfusion of blood and blood products in the last year or organ transplantation, operations, tattooing, drug abuse.[4]

Table 1. Sociodemographic characteristics of blood donors in General Kirkuk Hospital and their relevant history

Variable			n	Percent
Marital status	Single		146	14.60
	Married		854	85.40
Occupation	Health worker		3	0.30
	Student		35	3.50
	Earner		941	94.10
	Not working		21	2.10
Education	Not educated (illiterate)		79	7.90
	Intermediate education (primary &secondary school)		789	78.90
	High education (university)		132	13.20
Residence	Kirkuk	Urban	840	84.00
		Rural	130	13.00
	Other governorates		30	3.00
Monthly income	Poor		24	2.40
	Average		720	72.00
	Good		256	25.60
Risk factors	Previous blood donation		625	62.50
	Chronic disease		113	11.30
	Dental treatment		571	57.10
	Jaundice		81	8.10
	Prolonged drug using		40	4.00
	Surgical procedures		105	10.50
	Alcohol		2	0.20
	Tattoing		108	10.80
	Hijama		336	33.60
	Endoscopy		17	1.70
	War injury		13	1.30
	Prison		10	1.00

Statistical analysis was carried out using the available software (SPSS version 15) and chi-square was used to compare the significant difference between groups. The interpretation of the results was done through the measurement of p value with statistically significant effect when p value is less than 0.05.

Results

As shown in table 1, a total of 1000 consecutive blood donors were screened at General Kirkuk Hospital in blood bank unit during the study period. The median age of the study subjects was 25 years (range 18-65 years) of all donors.

As shown in table 2 the number of HCV positive cases was 4 (0.40%), HBV positive cases 16 (1.60%), VDRL positive cases 19 (1.90%) and no cases were reported for HIV.

Table 2. Number and percentage of positive cases of Hepatitis B, Hepatitis C, HIV and VDRL (+) cases among blood donors in central blood bank in General Kirkuk Hospital.

	HCV	**HBV**	**HIV**	**VDRL**
Positive cases	4	16	0	19
Percentage	0.40%	1.60%	0	1.90%

Table 3 shows from all the subject who had done tattooing 1 (0.10%) HCV positive and 107 (10.7%) HCV negative.

Table 3. The distribution of HCV (negative & positive) samples among persons with tattooing.

Tattooing	HCV (-)	HCV (+)	Total	
	n (%)	n (%)	n	%
Yes	107 (10.70)	1 (0.10)	108	10.80
No	889 (88.90)	3 (0.30)	892	89.20
Total	996 (99.60)	4 (0.40)	1000	

χ^2=0.002, d.f.=1, p>0.05

Table 4 shows from all the subject who had a dental intervention 5 (0.50%) HBV positive, and 566 (56.60%) HBV negative.

Table 4. The distribution of HBV (negative & positive) samples among persons with dental intervention.

Dental intervention	HBV (-)	HBV (+)	Total	
	n (%)	n (%)	n	%
Yes	566 (56.60)	5 (0.50)	571	57.10
No	418 (41.80)	11 (1.10)	429	42.90
Total	984 (98.40)	16 (1.60)	1000	

χ^2=4.436, d.f.=1, p < 0.05

Table 5 (A). The percentage of HBV (negative & positive) subjects who had done hijama

Hijama	HBV (-)	HBV (+)	Total	
	n (%)	n (%)	n	%
Yes	331 (33.10)	5 (0.50)	336	33.60
No	653 (65.30)	11 (1.10)	664	66.40
Total	984 (98.40)	16 (1.60)	1000	

χ^2=0.040, d.f.=1, p > 0.05

Table 5 shows from all the subjects who had done hijama 5 (0.50%) HBV positive, and 331 (33.10%) HBV negative, the table 8 (B) show: from all subjects who had done hijama 1 (0.10%) HCV positive, and 335 (33.50%) HCV negative.

Table 5 (B). The percentage of HCV (negative& positive) sample who had done hijama.

Hijama	HCV (-)	HCV (+)	Total	
	n (%)	n (%)	n	%
Yes	335 (33.50)	1 (0.10)	336	33.60
No	661 (66.10)	3 (0.30)	664	66.40
Total	996 (99.60)	4 (0.40)	1000	

χ^2=0.133, d.f.=1, p > 0.05

Table 6 shows that from all subjects who had done endoscopy 1 (0.10%) HBV positive, and 16 (1.60%) HBV negative. The table 6 (B) show that from all the subjects who had done endoscopy 1 (0.10%) HCV positive and 16 (1.60%) HCV negative.

Table 6 (A). The percentage of HBV (negative& positive) samples of who had undergone endoscopy.

Endoscopy	HBV (-)	HBV (+)	Total	
	n (%)	n (%)	n	%
Yes	16 (1.60)	1 (0.10)	17	1.70
No	968 (96.80)	15 (1.50)	983	98.30
Total	984 (98.40)	16 (1.60)	1000	

χ^2=2.014, d.f.=1, p > 0.05

Table 6 (B). The percentage of HCV (negative& positive) samples of who had undergone endoscopy.

Endoscopy	HCV (-)	HCV (+)	Total	
	n (%)	n (%)	n	%
Yes	16 (1.60)	1 (0.10)	17	1.70
No	979 (97.90)	4 (0.40)	983	98.30
Total	995 (99.50)	5 (0.50)	1000	

χ^2=8.822, d.f.=1, p < 0.05

The table 7 shows that from all the subjects who had war injuries 4 (0.40%) HBV positive and 9 (0.90%) HBV negative.

Table 7. The percentage of HBV (negative & positive) samples who had a war injury.

War injury	HBV (-)	HBV (+)	Total	
	n (%)	n (%)	n	%
Yes	9 (0.90)	4 (0.40)	13	1.30
No	975 (97.50)	12 (1.20)	987	98.70
Total	984 (98.40)	16 (1.60)	1000	

χ^2=71.181, d.f.=1, p < 0.05

Table 8 shows that over all vaccinated persons was 17 (1.70 %) who were HBV negative, while 983 (98.30%) were not vaccinated and out of this group 967 was HBV negative and 16 were HBV positive. The percentage of VDRL in the study was 1.90%.

Table 8. The percentage of HBV (-) & (+) population regarding receiving HBV vaccines.

Vaccination	HBV (-)	HBV (+)	Total	
	n (%)	n (%)	n	%
Yes	17 (1.70)	0 (0)	17	1.70
No	967 (96.70)	16 (1.60)	983	98.30
Total	984 (98.40)	16 (1.60)	1000	

χ^2=0.281, d.f.=1, p > 0.05

Discussion

The results of this study indicate that overall rate of Hepatitis B and C in Kirkuk province was 2%. This reflects that viral Hepatitis is one of public health problems in this province.

The rate of Hepatitis B in the current study was 1.6% , this figure is higher than that reported by Ismail et al in Kirkuk province between the period (1999-2001), who show that the rate of infection to be 0.89%.[12]

This rate is lower than those reported in Kirkuk province by Kadir et al, between the period (1996-1998) who showed the rate of infection was 1.76%.[13]

By comparing the study results with other provinces in Iraq, the results were lower than that reported by Kaitano AE in Tikrit province in 1996 who showed that the rate of infection was 3%.[14]

By comparing our study results with other countries, we found that our result is lower than reported in Mersin, Turkey who showed the rate of infection was 2.2 in 2011.[4]

The difference in the rate of infection in this study and others might be related to the sample sizes and the period of study.

On the other hand, the rate of Hepatitis C in this study was 0.4% which is lower than that reported by Mohammad I et al who showed that the rate of infection was 0.93% [12], and lower than those reported by Kaitano[14] who showed that the rate of infection was 0.67%, and higher than those reported by Kadir et al[13] who showed that the rate of infection was 0.07%, and the rate is equal to that reported in Mersin, Turkey which is also 0.4%.[4]

The prevalence of HBV was high from 1996 to 1998, then declined between 1999-2001, and then got higher from 2012 to 2013, while the prevalence of HCV is low between1996-1998, then started to increase from 1999 to 2001, and then declined between 2012-2013.

The raise in the rate of HBV might be attributed to the failure of improvement in hygienic, social and educational conditions. It could also be due to the defect in HBV vaccination program among population in Kirkuk province. The highest seropositivity was among those who had done hijama, followed by dental intervention, war injury, endoscopy, and tattooing.

The rate of subjects who know what hepatitis is 20.2% and the rate of subjects who know how the disease is transmitted is 15.5. This is also a low percentage and the rate of subjects who know how to prevent from the disease is 14.4% and it is a low percentage too.

The rate of VDRL positive cases in this study was 1.9% and this reflects that the VDRL is one of considerable health problems in this society.

It is concluded that a substantial percentage of the blood donors harbor HBV, HCV and VDRL. Most important risk factor is hijama which responsible for 0.7% of seropositivity. Therefore, strict selection of blood donors with the emphasis on getting voluntary donors and comprehensive screening of donors' blood for HIV, HBV, HCV and syphilis, using standard methods are highly recommended to ensure the safety of blood for the recipient. The prevalence of HBV, HCV, and syphilis co-infection needs to be studied on a larger scale for the better understanding of the impact on clinical outcome and treatment response.

A proper screening of blood and blood products for Hepatitis B and C infections is recommended, while no surgical procedures should be carried out prior to the screening of the patient.

The masses should be educated about hepatitis and other viral infections. Professional donors should be discouraged.

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