

Prevalence of Hepatitis C Virus Antibodies among Blood Donors at Prince Hashem Hospital, Zarka- Jordan

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Abstract

Background: Hepatitis C Virus (HCV) is one of the Hepatitis agents known to be transmitted through blood and blood products. Hepatitis C virus has been implicated as a major cause of chronic liver disease and hepatocellular carcinoma worldwide. This study was, therefore, undertaken with the objective of determining the sero-prevalence of HCV Antibodies among blood donors in Prince Hashem Hospital, Zarka - Jordan.

Method: A total of blood donors all subjects were tested for Hepatitis C virus antibodies using third generation Enzyme Linked Immunosorbent Assay (ELISA).

Results: In a three year study, eight thousand seven hundred and fifty healthy blood donors in Zarka were screened for anti hepatitis C Virus (anti HCV). The results showed that the prevalence of anti HCV in all donors was 0.79 % (0.80% for males and 0.54% for females). Anti HCV showed prevalence increase with age with a peak of 1.62% in the earlier age group (31-40 years).

Conclusion: The seroprevalence of blood donor tests were found to be concordant with previous studies held in Jordan.^{22,23} Healthy donor selection is of paramount importance in blood bank services. Vigilant donor selection and younger age group affect frequency of HCV. All blood donors must be screened for anti HCV Ab.

Keywords: Hepatitis C virus, Hepatitis C virus antibody, anti HCV, ELISA.

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Introduction

Viral hepatitis is now known to be the most common complication of blood transfusion.¹ The hepatitis agents known to be transmitted through blood and blood products include Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), Hepatitis D Virus (HDV), and Hepatitis G Virus (HGV).²

Hitherto, only Hepatitis A Virus (HAV), and HBV were characterized, and hepatitis not caused by these two agents was then referred to as non-A non-B hepatitis.³ In 1989, the genome of the HCV was cloned and the virus was identified as the major cause of non-A non-B hepatitis with blood transfusion and intravenous drug use as the major modes of transmission.^{3,4}

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HCV has been implicated as a major cause of chronic liver disease, most of which progress to end-stage liver disease and hepatocellular carcinoma.⁵ Although screening for HCV markers in blood donors was introduced over two decades ago, transfusion-associated hepatitis due to HCV has continued to occur. The discovery and subsequent cloning of the Hepatitis C Virus (HCV) in 1989 was rapidly followed by the development of Enzyme Linked Immuno-Sorbent Assays (ELISAs) that were specific for HCV antibodies.^{6, 7} While the first generation and second generation kits identified 80 and 90 to 95 per cent^{8, 9} of the HCV positive blood donors, respectively, the currently available third generation test kits are far more sensitive. Consequently, the incidence of transfusion associated hepatitis C has reduced significantly in the developed countries with the introduction of routine screening of blood for HCV antibodies.¹⁰ Reactivity amongst blood donors varies from 0.4 to 19.2 per cent.¹¹

Material and Methods

The present study was conducted on volunteer blood donors who visited Prince Hashem Hospital in Zarka from March 2003 to May 2005. Eight thousand seven hundred and fifty blood donors were screened for anti HCV by a third generation ELISA kit from Greencross Life Science Corp, Korea according to manufacturer instructions. All donors were Jordanian adults (8216 males and 534 females) first time blood donors, who denied any history of jaundice, blood or blood products transfusion, and drug intake. The majority of donors were relatives to inpatients. All were physically examined and found medically fit to donate blood.

Results

The number of positive cases, their percentages and sex distributin for anti HCV during the study period are presented in table (1) and table (2). The total number of positive cases found for anti HCV was 69 (67 males and 2 females).

The prevalence of anti HCV was 0.79%. The percent positive cases for the different age groups are presented in table (3). Anti HCV lowest prevalence rate was in the <20 age group (0.07%), and the highest was in the 31-40 age group (1.62%).

The prevalence of anti HCV in <20 age group was significantly different from that in the (21-30) age group ($p < .01$); and so between (21-30) and (31-40) age groups. However, no significant difference was found among blood donors in their anti HCV content between (31-40) and (41-50) age groups ($p=0.1885$); and between (41-50) and (>50) age groups ($p = 0.4851$).

Table 1: The number of positive cases and their percentage during time of the study.

Year	No. of Donors	Anti-HCV +	
		Number	%
2003	2900	23	0.79
2004	3250	26	0.80
2005	2600	20	0.77
Over all	8750	69	0.79

Table 2: Distribution of anti HCV according to sex in blood donors.

Sex	Screened	Anti-HCV prevalence	
		Number	%
Male	8380	67	0.80
Female	370	2	0.54
Total	8750	69	0.79

Table 3: Number of anti HCV positive cases as stratified by age.

Age Group (Years)	No. of Donors	Anti-HCV Prevalence	
		Number	%
<20	1334	1	0.07
21-30	5060	33	0.65
31-40	1846	30	1.62
41-50	404	4	0.99
>50	106	1	0.94
Total	8750	69	0.79

Discussion

Seroprevalence of anti-HCV varies worldwide. It is 6 %in blood donors in Africa, 1.5 %in Japan, 0.6 %in USA, 0.24 %in Finland and 0.17 %in the UK.¹²⁻¹⁶ Various studies were carried out in Pakistan show seroprevalence from 0.7% % to 20%.^{17, 18} In fact, blood donors tend to be highly screened population and therefore their anti-HCV prevalence rates might not reflect those in general population.¹⁹

The prevalence rate of anti HCV blood-donor population in Jordan was midway between the lower rate of Western Europe and the United States, and surprisingly higher rate of south east Asia; and comparable to that of other countries of the Middle East with exception of Egypt.^{20, 21} Younger age group of donors and vigilance on donor selection are probably the main factors that resulted in low seroprevalence in our study.

Conclusion

The seroprevalence of blood donor tests were found to be concordant with previous studies held in Jordan.^{22, 23} Healthy donor selection is of paramount importance in blood bank services. Vigilant donor selection and younger age group affect the frequency of HCV. All blood donors must be screened for anti HCV Ab.

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