

# Seroprevalence of Hepatitis B and C Viruses among Blood Donors in Sulaimani Major Blood Bank for the Years 2006 and 2007: A Comparative Study.



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## Abstract

*Background: Hepatitis B (HBV) and C (HCV) viral infections are a serious global public health problem. The objective of this study was to verify the trend of HBV and HCV infections among blood donors in Major Blood Bank of Sulaimani in the years 2006 and 2007. Patients and Methods: The study analyzed the data of blood donors in Sulaimani city who donated blood at Major Blood Bank of Sulaimani during the year 2006 and their correspondence in 2007. HBsAg status was determined by using BIOELISA HBsAg TEST KIT and antibodies to HCV using BIOELISA Anti-HCV TEST KIT. Samples repeatedly reactive for HBsAg or anti-HCV were considered positive for HBV or HCV infection respectively. We set up a hypothesis that to be tested using Chi-Square test at 95% confidence level and degree of freedom equal to one. Results: The overall seroprevalence of HBV infection among donors was 0.48% in 2006 and changed significantly in the next year to 0.25%, ( $P < 0.05$ ). The overall seroprevalence of HCV among donors was 0.11% and did not changed significantly in the next year, ( $p > 0.05$ ). Significant decrease in HBsAg seroprevalence was particularly seen in non-first time donors in 2007, ( $p < 0.05$ ). All female donors were negative for HBV and HCV in both years. Conclusion: There are low rates of both HBV and HCV infections among blood donors in 2006 and 2007, HCV is less seroprevalence than HBV, and the decreased rate of HBV infection in 2007 than in 2006 indicates good control of known risk factors. Also, factors that led to zero% of infection among female donors should be clarified and followed.*

**Keywords:** blood donors, Hepatitis B virus, Hepatitis C virus, blood bank, Sulaimani city.

## 1. Introduction

Hepatitis B (HBV) and C (HCV) viral infections are a serious global public health problem [1]. The transmission routes include blood, blood products, blood-contaminated needles and sexual contact. Transmission of HBV and HCV, through blood transfusion is still a serious threat, so blood donations are tested for hepatitis B and hepatitis C with several different tests [2-4]. The implementation of antigen or antibody tests in patients' blood infected with HBV or HCV has reduced, but not completely eliminated, the risk of transmission of viral infections by transfusion of blood or its products [5]. **Aim of study** This paper studies the impact of hepatitis B and C viral

infections among blood donors by comparing their seroprevalence between donors in the years 2006 and their correspondence in 2007 in Sulaimani city. It also gives an idea about some epidemiological aspects of these infections in the community .

## 2. patients and Methods

This study is a retrospective study. The data were collected from Sulaimani blood bank database. The duration of study extended between October 2007 and June 2008. Only blood donors who donated blood at this facility in the year 2006 and those in 2007 were included in study. Information on age, sex, and frequency of donations were collected for every donor.

For screening of blood, a five-milliliter blood sample was collected aseptically into a sterile test tube from each donor and tested for HBsAg and anti-HCV antibodies within 24 hours of collection. HBsAg status was determined by using BIOELISA HBsAg TEST KIT (M/S BLOKIT S.A. SPAIN). The screening assay has 99% sensitivity and 100% specificity. Antibodies to HCV were determined using the BIOELISA Anti-HCV TEST KIT (M/S BLOKIT S.A. SPAIN). According to their package insert (2005), the screening assay has 98.2% sensitivity and 99.7% specificity. Samples positive for any of the above were re-tested. Samples repeatedly reactive for HBsAg or anti-HCV were considered positive for HBV or HCV infection respectively.

### 3. Statistical analysis

The study population was stratified by year of donation. The mean age group, sex, and frequency of donation (first time or more) were recorded. We set up a hypothesis that to be tested using Chi-Square test at 95% of confidence level and degree of freedom equal to one.

### 4. Results

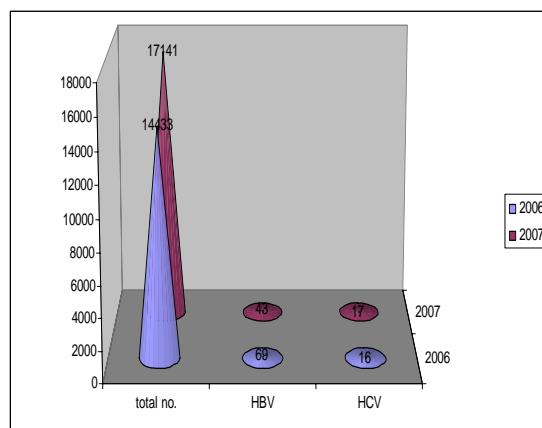
In the year 2006, there were 14433 blood donations from donors eligible for this study, while the number was 17141 in the next year. The mean age of the donors in 2006 was 26 years (equal or more than 19 year old), while in the next year was 28 years (equal or more than 18 year old). Males overwhelmingly (98.6%) and (99%) dominated the donor population in 2006 and 2007 respectively, (Table 1).

**Table 1: Sex distribution of HBV and HCV infection in blood donors in both in years**

Sex	Total no. of donors	HBV	HCV
Male	31226	112	33
Female	348	0	0

$\chi^2=7.306, P<0.05$

The overall seroprevalence of HBV infection among donors in 2006 was 69 (0.48%), (95% CI 0.38%–0.58%) and changed significantly in the next year to 43 (0.25%), (95% CI 0.20%–0.30%) (Figure 1), (P<0.05).



**Figure 1: Annual seroprevalence of HBV and HCV in Sulaimani blood bank donors.**

Exact results were seen when restricting the analysis to males. Although the number of female donors in this sample was small (204 in 2006 and 144 in 2007), the results demonstrated that all females in the two years were HBV negative, and a significant difference between two sexes is found (Table 1), P<0.05. The overall seroprevalence of HCV among donors in 2006 was 16 (0.11%), (95% CI 0.09%–0.13%) in 2006 and did not change significantly in the next year 17 (0.1%), (95% CI 0.06%–0.14%), (Figure 1), (p > 0.05). Similar results were seen when restricting the analysis to males; All females were negative for HCV. The results revealed that HBV infection among donors in both years (112) is higher than HCV infection (33), and the result was statistically significant, (P<0.05). The results showed that 73 of blood donors are non-first time donors in the year 2006, eight of them were HBs Ag positive, whereas the results were significantly changed in the next year as 94 of donors were non-first time and only

three of them were HBs Ag positive, ( $P < 0.05$ ). None of those multiple donors were HCV positive in both years.

### 5. Discussion

The analysis of this paper showed a significant lowering trend of HBV infection in 2007 when compared with 2006, which might reflect a good control and preventive measures used in Sulaimani city; these measures might also explain the very low percentage of HCV infection among donors although it did not change significantly during the two years. The low HCV seroprevalence might need to be confirmed using RT-PCR for HCV RNA determination as false negative cases might be found in immunological approach [6]. Any potential donor with a previous history of HCV infection is requested to refrain from donating blood; therefore in 2007 none of multiple donors have HCV infection. The HBsAg positivity rates were found as 1.38% in Turkey in year 2007, 3.4% in Georgia in year 2001, 1.5% in Kingdom of Saudi Arabia in year 2002, 4.3% in Egypt, and 2.21% in Pakistan in year 2006. When we reviewed the same regions for HCV, the anti-HCV positivity rate was found to be 0.37%, 6.9%, 0.4%, 2.7% and 0.5% [7-11]. Therefore, the results of our

study seem to be lower than the rates in many other countries. The absence of HBV and HCV infections among female blood donors might reflect the small number of female donors when compared to males, good educational measures, some social factors, and/or some physiological factors. While another study done in Philippines found that, due to unknown reasons, young women are at high risk of acquiring HBV [12].

In this study, HBV seroprevalence is higher than HCV seroprevalence which is against the fact that exposure of a healthy adult to HBV infection recovers completely in 95% of the cases, whereas they remain infected in 85% of the cases if exposed to HCV infection [13-15].

### 6. Conclusion

In this study we conclude that HBV and HCV infections are of low seroprevalence among blood donors in Sulaimani city, and the lowering trend of HBV infection in blood donors in 2007 is a welcome and interesting finding. While HCV is uncommon, less seroprevalence than HBV, and not growing in prevalence among blood donors. Also, the factors that led to zero% of infection among female donors should be clarified and followed.

## 7 . References

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لە نیوان خوین بە خەشەکان C و جوۆری B بلاویونەوهی مسڵ هەوکردنی جگەری قایروۆسی جوۆری  
لە بانکی سەرەکی خوین لە سلیمانی بو هەر دوو سالی ۲۰۰۶ و ۲۰۰۷ : تووژینهوهی بەراورد

علی حاتم حسین : دەستەوی خویندنی تەکنیکی سلیمانی . هەریمی کوردستان / عێراق .

### پوخته

بە شیبوهیهکی گشتی : هەوکردنی جگەری قایروۆسی جوۆری B و جوۆری C کیشیهیهکی تەندروستی گشتی یه و ترسناکه ، نامانجی  
نەم لیکۆئینهوهیه دنیابوونه له ریزهی بلاویونەوهی هەوکردنی جگەری قایروۆسی جوۆری B و جوۆری C لە نیوان خوین  
بە خەشەکان لە بانکی سەرەکی خوین لە سلیمانی بو هەر دوو سالی ۲۰۰۶ و ۲۰۰۷ . نە خۆشەکان و رینگاکی تووژینهوهکه : نەم  
لیکۆئینهوهیه دا شیکردنەوهی داتاکی خوین بە خەشەکان لە شاری سلیمانی دا ، تایبەت بە ئەو کەسانە که خوینیان بە خشی  
وه لە بانکی سەرەکی خوین لە سلیمانی ، وه دەرکەوت بە بونی رووکهشی دژتەنی قایروۆسی جگەر جوۆری B ، بەرینگە پشکنین که  
پیی دەئین ( BIOELISA HBsAg TEST KIT ) و دەرختنی دژلەش لە قایروۆسی جگەر جوۆری C بە رینگە  
BIOELISA Anti-HCV (TEST KIT) ، له هەردو پشکنین دا ئەو نموونانە که کارلێک کردن تییدا روویدا بە  
موجب دانەنریت . هەستاین بە دانانی گریمانه ( hypothesis ) یهک رینگای کای سکویر که له ناستی ۹۵٪ ی دنیایی  
و پلهی سەرپهستی (degree of freedom) ۱ دا . ئە نجامەکان : ریزهی بلاویونەوهی قایروۆسی هەوکردنی جگەر جوۆری B لە  
نیوان خوین بە خەشەکان یه کسان بوو به ۰,۴۸٪ له سالی ۲۰۰۶ ، ئەو ریزهیه به شیبوهی گرنگ گۆرا له سالی دوايي که گهيشته  
۰,۲۵٪ (  $p < 0,05$  ) . و ریزهی بلاویونەوهی قایروۆسی هەوکردنی جگەر جوۆری C لە نیوان خوین بە خەشەکان یه کسان بو به  
۰,۱۱٪ له سالی ۲۰۰۶ به لام له سالی داها توودا هیچ گۆرانکاریهکی گرنگ نەهات به سەرئەم ریزهیه دا . بلاویونەوهی مسڵ  
قايروۆسی جگەر جوۆری B له سالی ۲۰۰۷ به شیبوهیهکی گرنگ دابهزی له نیوان ئەو خوین بە خشانە که چەند جاری خوینیان  
بە خشیوه (  $p < 0,05$  ) . نافرته خوین بە خەشەکان هەموویان سالب بوون سەبارەت بە هەوکردنی جگەری قایروۆسی جوۆری B و  
جوۆری C . دەرئە نجام : ریزهیهکی کهم ههیه به توشبوون به هەوکردنی جگەری قایروۆسی جوۆری B و جوۆری C سەبارەت بە  
خوین بە خەشەکان بو هەر دوو سالی ۲۰۰۶ و ۲۰۰۷ ، ریزهی بلاویونەوهی هەوکردنی جگەری قایروۆسی جوۆری C که مەتره له جوۆری  
B ، و کهم بوونهوهی ریزهیه هەوکردنی جگەری قایروۆسی جوۆری B له سالی ۲۰۰۷ دا بەراورد به ۲۰۰۶ ، ئەوه دەردهخات که  
کوئرتوئیکي باش ههیه له سەر ئەو هوکاره ترسناکه ناسراوانه ، وه ههروهها ئەو هوکارانه که بوون به هوی دەرکەوتنی ریزهیه  
سفر٪ له نیوان نافرته خوین بە خەشەکان دەبی دەر بخری و به دوادا چونی بو بکری .

## الانتشار المصلي لالتهابات الكبد الفيروسي نمط B ونمط C بين المتبرعين بالدم في مصرف الدم الرئيسي في السليمانية للسنتين ٢٠٠٦ و ٢٠٠٧: دراسة مقارنة.

علي حاتم حسين: هيئة التعليم التقني في السليمانية, اقليم كردستان / العراق.

### الخلاصة

نظرة عامة: تمثل التهابات الكبد الفيروسي نمط B ونمط C مشكلة صحية عالمية عامة وخطيرة. ان هدف هذه الدراسة كان للتحقق من مدى انتشار التهابات الكبد الفيروسي نمط B ونمط C في المتبرعين بالدم في مصرف الدم الرئيسي في السليمانية للسنتين ٢٠٠٦ و ٢٠٠٧. المرضى وطرق البحث: في هذه الدراسة تم تحليل بيانات المتبرعين بالدم في مدينة السليمانية الذين تبرعوا بالدم في مصرف الدم الرئيسي في السليمانية وتم تعيين وجود المستضد السطحي لفايروس الكبد نمط B بواسطة عدة الفحص المسماة BIOELISA HBsAg TEST KIT , وكذلك تعيين الاجسام المضادة لفايروس الكبد نمط C باستخدام BIOELISA Anti-HCV TEST KIT. ان العينات التي كانت متفاعلة في كلا الفحوصين اعتبرت موجبة. قمنا بوضع فرضية (hypothesis) ليتم اختبارها بطريقة كاي سكوير عند مستوى ثقة ٩٥٪ ودرجة حرية (degree of freedom) ١. النتائج: ان الانتشار المصلي لفايروس التهاب الكبد نمط B بين المتبرعين بالدم كان ٤٨٪ و ٠٪ في سنة ٢٠٠٦ وقد تغيرت النتيجة بدرجة مهمة في السنة التي تلتها الى ٢٥٪ (قيمة  $P < ٠.٠٥$ ). وان الانتشار المصلي لفايروس التهاب الكبد نمط C بين المتبرعين بالدم كانت ١١٪ في سنة ٢٠٠٦ ولم تتغير النتيجة بدرجة مهمة في السنة التي تلتها (قيمة  $P > ٠.٠٥$ ). ان الانتشار المصلي لفايروس الكبد نمط B في سنة ٢٠٠٧ انخفض بدرجة مهمة في المتبرعين اكثر من مرة واحدة (قيمة  $P < ٠.٠٥$ ). كل النساء المتبرعات كن سالبات لالتهابات الكبد الفيروسي نمط B ونمط C. الاستنتاج: توجد معدلات اصابة منخفضة لالتهابات الكبد الفيروسي نمط B ونمط C عند المتبرعين بالدم للسنتين ٢٠٠٦ و ٢٠٠٧, وأن الانتشار المصلي لفايروس التهاب الكبد نمط C اقل من فايروس التهاب الكبد نمط B, وأن انخفاض الأصابة بالتهاب الكبد الفيروسي نمط B في سنة ٢٠٠٧ عن مثيلتها في سنة ٢٠٠٦ يوضح السيطرة الجيدة على عوامل الخطورة المعروفة. بالاضافة الى ما تقدم, ان العوامل التي أدت الى نسبة اصابة صفر٪ لدى النساء المتبرعات يجب ان توضح وتتبع.