

Seroprevalence of viral hepatitis B and C among pre-surgical patients in Basrah, Iraq

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ABSTRACT

Background: Viral hepatitis is an important worldwide health problem. Patients undergoing any surgical procedure may have this infection, requiring special precautions so that they cannot transmit it to others.

Objectives: To determine the seroprevalence of viral hepatitis B and C in pre-surgical patients.

Subjects and methods: This cross-sectional study was performed on adult presurgical patients admitted to Basrah General Hospital for elective surgery. Convenience sampling was used to enroll the participants aged 18 years and above. Demographic and medical information were collected. Blood samples were examined by ELISA for HBsAg and HCV antibodies.

Results: Out of 254 pre-operative patients (mean age 45.7 ± 16.8 years), 63% of them were males), and 15 (5.9%) were HBsAg seropositive while 7 (2.8%) were Anti-HCV seropositive. None was concurrently positive for both hepatitis B and C. The overall sero-prevalence of either hepatitis B or C was 8.7%. In multivariate analysis, the significant risk factors for viral hepatitis seropositivity were; history of dental surgical intervention (OR, 12.84; 95% CI, 1.60-24.69; $P=0.018$), number of blood transfusion (OR, 2.39; 95% CI, 1.07-4.96; $P=0.033$), and tattooing (OR, 4.59; 95% CI, 1.09-7.33; $P=0.037$).

Conclusion: The seroprevalence of viral hepatitis B and C in presurgical patients in Basrah was high. Routine screening of presurgical patients is recommended to prevent spread of the disease.

Key words: Basrah, Hepatitis B, Hepatitis C, Pre-surgical, Seroprevalence

الانتشار المصلي لالتهاب الكبد الفيروسي نوعي (ب) و (ج) عند المرضى ما قبل اجراء العملية الجراحية في البصرة/ العراق

خلفية البحث: يعد التهاب الكبد الفيروسي مشكلة صحية هامة في جميع أنحاء العالم. ان المرضى الذين يخضعون لأية عملية جراحية قد يكونون حاملين لهذا المرض مما يتطلب اتخاذ احتياطات خاصة كي لا ينتقل المرض الى الآخرين.

الاهداف: تحديد مدى الانتشار المصلي لالتهاب الكبد الفيروسي نوعي (ب) و (ج) عند المرضى ما قبل اجراء العملية الجراحية.

طرائق البحث: تم اجراء هذه الدراسة المقطعية- المستعرضة في مستشفى البصرة العام على المرضى الداخليين لأجراء العمليات الجراحية الاختيارية. تم جمع البيانات الديموغرافية والطبية وفحص عينات الدم بواسطة فحص ELISA للكشف عن HBsAg and HCV antibodies.

النتائج: شملت الدراسة ٢٥٤ مريضاً تبلغ اعمارهم ١٨ سنة فما فوق من كلا الجنسين بمتوسط عمر 45.7 ± 16.8 عاماً، وكان 63% منهم من الذكور، كانت نسبة الانتشار المصلي الشامل لالتهاب الكبد الفيروسي نوع (ب) و (ج) 8.7% وكان نوع (ب) فقط 5.9% و (ج) 2.8%. لم تؤثر إصابة بكلا الفيروسين في آن واحد. اثبت التحليل متعدد المتغيرات ان عوامل الخطورة التي لها ارتباط موجب ومعتمد احصائياً بالانتشار المصلي لالتهاب الكبد الفيروسي هي: وجود تاريخ تداخل جراحي للأسنان (OR, 12.84;

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(OR, 2.39; 95% CI, 1.07–4.96; P=0.033) وعدد مرات نقل الدم (P=0.018, 95% CI, 1.60–24.69; (OR, 4.59; 95% CI, 1.09–7.33; P=0.037) ، والوشم

الاستنتاجات: إن مدى الانتشار المصلي لالتهاب الكبد الفيروسي نوعي (ب) و(ج) عند المرضى ما قبل اجراء العملية الجراحية في البصرة مرتفع، لذا من المستحسن اجراء الفحص الروتيني للمرضى لمنع انتشار المرض.

كلمات المفتاح: البصرة، التهاب الكبد الفيروسي (ب) والتهاب الكبد الفيروسي (ج)، ما قبل العمليات الجراحية، الانتشار المصلي

INTRODUCTION

Hepatitis is an inflammation of the liver most commonly caused by five viral infections (A, B, C, D, and E).^[1] Chronic stage of hepatitis B and C may increase the risk of liver cirrhosis and hepatocellular carcinoma.^[2] Viral hepatitis is the tenth leading cause of death and the leading cause of liver cancer worldwide.^[3] Despite the availability of a highly effective vaccine and improvement in antiviral therapy, hepatitis B remains a major health problem. About 2 billion people (approximately 30% of the world's population) are estimated to be infected with hepatitis B virus (HBV) and 350 million (5-15% of the total cases) are carriers of the virus.^[4] Most of these cases occur in countries of Asia and Africa where the virus is endemic.^[5] The prevalence of chronic HBV infection varies according to geography and it is highly variable, ranging from 0.1% in the United States to 20-30% in some Pacific Island nations.^[6] In Iraq, it was reported that the prevalence rate of HBsAg in apparently healthy individuals was 1.6%. It was more frequent in age group above 40 years and in males more than females.^[7] Although hepatitis C virus (HCV) infection is endemic worldwide, there is a large degree of geographic variability in its distribution. Countries with the highest reported prevalence rates are located in Africa and Asia while areas with lower prevalence include the industrialized nations.^[8] In Western Pacific region; most countries have prevalence rates from 1% to 2%. In Africa, the prevalence of HCV is even higher in some areas, reaching a level of up to 10%.^[9] In the

Arab World, the WHO estimates that HCV prevalence is 1–4.6%, with level higher than 20% in Egypt.^[10,11] In Iraq it was reported to be 0.4% in apparently healthy individuals.^[7] Concurrent HBV/HCV infection has been reported in approximately 10–25% of patients, particularly among drug abusers. The clinical presentation and prognosis are generally more severe in patients with HBV/HCV co-infection than in those with single infection.^[8,9] HBV can be transmitted through the blood, semen, vaginal fluids, and other body fluids of an infected individual.^[12] HCV however, can only be contracted through blood to blood contact.^[13] The prevalence of HBsAg and anti-HCV in hospitalized surgical patients is high.^[14] This problem of viral hepatitis in hospitalized patients is not adequately controlled and there is a lack of routine serological screening prior to surgery although the asymptomatic patients have great danger of spreading the infection to other patients and medical personnel.^[6,15] In addition, scarcity of researches about this health problem in Basrah justified carrying out this study. The aim of this study was to estimate the seroprevalence of hepatitis B and C among presurgical patients in Basrah and its associated risk factors.

SUBJECTS AND METHODS

This cross-sectional study was carried out at Basrah General Hospital for the period from April 2014 to March 2015. The participants were patients aged 18 years and above of both sexes, who were admitted Basrah General

Hospital for elective surgery during the study period, and were asymptomatic for liver diseases. A convenient sample of 254 patients was decided upon. The hospital was visited twice weekly. All patients to be operated on the next day of the visits were included until the targeted sample size was obtained. After obtaining an informed consent, the participants were interviewed according to a special questionnaire designed for the purpose of the study. It contains items exploring socio-demographic information such as age, sex, educational level, marital status, occupation, and alcohol intake history. In addition, information about history of exposure to certain risk factors of viral hepatitis such as blood transfusion, tattooing...etc were also inquired about. Serological testing for HBsAg and anti-HCV by ELISA was performed in the laboratory of Basrah General Hospital. Blood samples were drawn shortly after admission. The study was approved by the Research and Ethical Committee of College of Medicine, Basrah University.

Statistical analysis

The statistical analysis was made using Statistical Package for Social Sciences (SPSS) version 19. Chi squared test and Fisher Exact tests were used to test significance of

association between risk factors and seropositivity of viral hepatitis. Logistic regression analysis was used to determine the independent association. P-value < 0.05 was considered statistically significant.

RESULTS

The mean age of the participants was 45.7 ± 16.8 years (range 18-80 years), about two thirds (63%) of them were males. The majorities were married (87%), and most of them (66.9%) were with low educational level. The prevalence of HBsAg was 5.9%, while that of anti-HCV was 2.8%. Nobody was simultaneously affected by both hepatitis B and C. The overall seroprevalence of either hepatitis B or C was 8.7%. As shown in (Table-1), no significant association was found between all socio-demographic characteristics and seropositivity for Hepatitis B or C. However, people aged 45-64 years showed higher rate of seropositivity than younger (18-44 years) and older people (≥ 65 years). Sex-wise, the proportion of males with seropositivity was higher than that of females. Health workers seem to be at higher risk of hepatitis B&C seropositivity than people with other occupations. The same pattern was also noticed among people from rural areas compared to those from urban areas but without significant association.

Table 1. Association of socio-demographic characteristics with ser-positivity of either viral hepatitis B or C

Risk factor	+ve Viral Hepatitis No.(%)	-ve Viral hepatitis No. (%)	Total No. (%)	X²; P-value
Age (years)				
18 - 44	7 (6.0)	110 (94.0)	117 (100)	4.693; 0.096
45 - 64	13 (13.5)	83 (86.5)	96 (100)	
≥ 65	2 (4.9)	39 (85.1)	41 (100)	
Sex				
Male	16 (10.0)	144 (90.0)	160 (100)	0.979; 0.322
Female	6 (6.4)	88 (93.6)	94 (100)	
Marital status				
Married	20 (9.0)	201 (91.0)	221 (100)	FET 2.621; 0.273
Unmarried	1 (3.4)	28 (96.6)	29 (100)	
Divorced/Widowed	1 (25.0)	3 (75.0)	4 (100)	
Education				
Illiterate/ Primary	15 (8.8)	155 (91.2)	170 (100)	0.017; 0.991
Intermediate/Secondary	5 (8.3)	55 (91.7)	60 (100)	
University &above	2 (8.3)	22 (91.7)	24 (100)	
Occupation				
Unemployed, retired, students, housewives	8 (7.5)	111 (92.5)	119 (100)	FET 3.626; 0.413
Self-employed	6 (8.0)	69 (92.0)	75 (100)	
Officials (Other than health workers)	3 (8.1)	34 (91.9)	37 (100)	
Construction Workers	3 (17.6)	14 (82.4)	17 (100)	
Health workers	1 (25.0)	4 (75.0)	5 (100)	
Residence				
Urban	13 (7.6)	159 (92.4)	172 (100)	0.820; 0.365
Rural	9 (11.0)	73 (89.0)	82 (100)	
Total	22 (8.7)	232 (91.3)		

(Table-2), presents the association between seropositivity of hepatitis B and C with certain medical conditions. Blood transfusion was directly and significantly related to high seropositivity (P=0.046). The seroprevalence of either HBsAg or Anti HVC increased significantly with increasing number of blood transfusion (P=0.027). The seroprevalence of hepatitis B or C was higher among patients with previous history of general surgical intervention

but without significant association, while a highly significant association was noticed between history of dental surgical intervention and seropositivity of hepatitis B or C (P=0.003). People with history of vaccination against hepatitis B showed insignificant higher seroprevalence than those without history of vaccination. History of renal dialysis was found to be significantly related to high seroprevalence of hepatitis B and C.

Table 2. Association of medical conditions with sero-positivity of either viral hepatitis B or C

Risk factor	+ve Viral Hepatitis No.(%)	-ve Viral hepatitis No. (%)	Total No. (%)	X ² ; P-value
Blood transfusion				
Absent	14 (6.9)	189 (93.1)	193 (100)	3.981; 0.046
Present	8 (15.7)	43 (84.3)	51 (100)	
No. of blood transfusion				
No	14 (6.9)	189 (93.1)	203 (100)	7.219; 0.027
1 – 2 times	4 (11.1)	32 (88.9)	36 (100)	
3 times & more	4 (26.7)	11 (73.3)	11 (100)	
Previous surgery				
No	10 (6.3)	149 (93.7)	159 (100)	3.024; 0.082
Yes	12 (12.6)	83 (87.4)	95 (100)	
Dental surgical intervention				
No	3 (2.7)	107 (97.3)	110 (100)	8.636; 0.003
Yes	19 (13.2)	125 (86.8)	144 (100)	
Vaccination				
No	16 (7.2)	205 (92.8)	221 (100)	5.203; 0.071
Do not know	5 (16.7)	25 (83.3)	30 (100)	
Yes	1 (33.3)	2 (66.7)	3 (100)	
Renal dialysis				
No	16 (6.5)	232 (93.5)	248 (100)	FET; < 0.001
Yes	6 (100)	0 (0.0)	6 (100)	
Total	22 (8.7)	232 (91.3)		

As shown in (Table-3), patients who shared shaving instruments had higher seroprevalence of viral hepatitis compared with those who did not share shaving instruments (14.3% vs. 8%) but without significant difference, whereas people who experienced tattooing were significantly at higher risk of serpositivity of

viral hepatitis compared to those without history of tattooing (P=0.040). The seroprevalence of viral hepatitis was higher among alcoholic patients than those with no history of alcohol intake (19% vs. 7.7%) but without significant association.

Table 3. Association of behavioral factors with sero-positivity with either viral hepatitis B or C

Risk factor	+ve Viral Hepatitis No.(%)	-ve Viral hepatitis No. (%)	Total No. (%)	X ² ; P-value
Sharing shaving instruments				
No	18 (8.0)	208 (92.0)	226 (100)	1.268; 0.262
Yes	4 (14.3)	24 (85.7)	28 (100)	
Tattooing				
No	13 (6.7)	182 (93.3)	195 (100)	4.222 0.040
Yes	9 (15.3)	50 (84.7)	59 (100)	
Alcohol intake				
No	18 (7.7)	215 (92.3)	233 (100)	3.122; 0.077
Yes	4 (19.0)	17 (81.0)	21 (100)	
Total	22 (8.7)	232 (91.3)		

A binary logistic regression analysis was done to identify the independent predictors of seropositivity of viral hepatitis among the studied population, (Table-4). The significant

independent factors were; dental surgical intervention, number of blood transfusion, and tattooing. All other studied variables were excluded.

Table 4. Logistic regression analysis of association of viral hepatitis seropositivity and studied risk factors

Variables	β -Coefficient	P- value	OR	95 % CI of OR	
				Lower	Upper
Dental surgical intervention	2.552	0.018	12.84	1.60	24.69
No. of blood transfusion	0.873	0.033	2.39	1.07	4.96
Tattooing	1.525	0.037	4.59	1.09	7.33

DISCUSSION

HBs antigen (HBsAg) positivity in different populations ranges from less than 0.5% to as high as 20%.^[16] Iraq is amongst Eastern Mediterranean Region (EMR) countries that are considered to have intermediate endemicity of viral B hepatitis with carrier rates of 2% to 5% in their general population.^[17] Our results showed that the seroprevalence of HBsAg in the presurgical patients was 5.9%. In Basrah, a study on blood donors in 2013 showed that 2.3% of them had serological evidence for hepatitis B virus infection.^[18] Another study on blood donors in Babylon governorate in 2008 showed a seroprevalence of 0.7%.^[19] In a study on general Iraqi population, the prevalence was 1.6%^[7] which is lower than the result of this study. In Sudan (2012),^[20] a study on surgical patients reported that the seroprevalence of viral hepatitis B surgical patient was 4.91% which is comparable with our result. In Pakistan, a study on preoperative cataract patients the seroprevalence of viral hepatitis B was 2.62%.^[21] Another study in Pakistan showed a seroprevalence of 3.6%.^[22] In Iran the seroprevalence of viral hepatitis B was 2.6%^[23] which is lower than the result of this study. Regarding anti-HCV seroprevalence in this study, it was 2.8% which is higher than that of several studies. In Basrah blood donors, it was 2.1%.^[18] A study in Babylon, Iraq done on

blood donors, the seroprevalence of anti HCV was 0.5%,^[19] and a survey on Iraqi population revealed a seroprevalence of 0.4%.^[7] In an Iranian study, the seroprevalence was 0.5%.^[23] The high anti-HCV seroprevalence in this study compared to that of others may be due to that 3/7 (42.9%) of those with seropositivity of HCV were patients on haemodialysis, and the seroprevalence of HCV in patients in Basrah center for dialysis was reported to be 42.6%.^[24] However, it is lower than that reported in Pakistan^[21] which was 6.17%. This considerable variation in seroprevalence of viral hepatitis in different studies may be related to differences in exposure to risk factors in different populations, mode of transmission of the disease, and health awareness of people about effectiveness of vaccination among different societies, or due to different laboratory methods for estimation of seroprevalence of viral hepatitis. An increase in trend of seroprevalence was noticed in the age group (45-64) years. This result is in agreement with that reported by Bharadwaj et al.^[25] This may be partly due to that the Expanded Programme on Immunization (EPI) in Iraq was initiated in the early 1980s and by 1987 immunization coverage had reached 94%. Then this coverage rate declined because of conflicts and sanction.^[26] This means that older people lack of immunization against HBV in their

times. In addition, high risky behaviors increase with age leading to increased rate of HBV exposure.^[27] More males than females were found to be viral hepatitis seropositive, although this difference was not significant. This result agrees with that of Tarky et al in Iraq.^[7] Males have a higher risky behavior, social mobility and freedom, and consequently a higher chance of exposure and getting infection.^[14] Some studies suggest that plasma clearance rate for HBsAg in males is slower than that in females and this might explain the higher rate among males.^[28,29] In addition, men are more frequent visitors to barber shops than women and may share shaving equipments.^[30] In multivariate analysis, history of dental surgical intervention was independently and significantly associated with seropositivity of viral hepatitis (OR, 12.84; 95% CI, 1.60-24.69; P=0.018). Such result had been previously reported by Petti et al.^[31] Number of blood transfusion rather than blood transfusion itself was found to be an independent significant risk factor for viral hepatitis seropositivity (OR, 2.39; 95% CI, 1.07-4.96; P=0.033). This result agrees with that reported by others.^[32, 33] Tattooing, similarly to many studies^[34, 35] was found to be an independent and significant risk factor for viral hepatitis seropositivity (OR, 4.59; 95% CI, 1.09-7.33; P=0.037). A review study showed that no evidence of increased risk of HCV infection when tattooing is done in professional parlors. However, the risk was significant when it was done in prisons or by friends particularly when non-sterile instruments were used.^[36]

In conclusion, the seroprevalence of hepatitis B and C among presurgical patients in Basrah was high. Therefore, certain precautions in surgical rooms should be taken to protect surgeons and other health care workers. Increased community awareness about viral hepatitis combined with prevention and control programs are needed.

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