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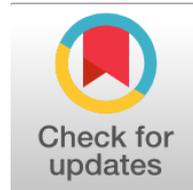
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Study of Seroprevalence of viral Hepatitis B,C and HIV Inpreoperative Assessment for Urological Surgeries: Studi Seroprevalensi Hepatitis B, C, dan HIV pada Penilaian Praoperasi untuk Bedah Urologi

Abdulla Y. Altimary, nadiaaldoseri1980@gmail.com (*)

Iraqi Board in urology. Iraqi ministry of Higher Education and Scientific Researches, University of Basra, Basra college of Medicine., Iraq

Nadia K. Abduljaleel, nadiaaldoseri1980@gmail.com

Iraqi Board in Community Medicine . Iraqi Ministry of Health . Basra Health directorate, Basra Teaching Hospital , Iraq

(*) Corresponding author

Abstract

General Background: Viral hepatitis B, hepatitis C, and human immunodeficiency virus remain major blood-borne infections that pose occupational hazards to healthcare workers, particularly during surgical procedures involving percutaneous exposure. **Specific Background:** Routine preoperative screening has been adopted in many medical institutions to identify infected patients and reduce transmission risk during operative interventions. **Knowledge Gap:** Limited local data are available regarding the seroprevalence of hepatitis B, hepatitis C, and HIV among patients scheduled for urological surgery in Basrah Teaching Hospital and the associated medical and behavioral risk factors. **Aims:** This study assessed the seroprevalence of HBV, HCV, and HIV among preoperative urological patients and identified related risk factors. **Results:** In this cross-sectional study of 254 patients, overall seroprevalence of either HBV or HCV was 8.7%, with HBV (5.9%) higher than HCV (2.8%), while HIV was not detected. Significant associations were observed with blood transfusion ($P=0.046$), dental surgical intervention ($P=0.003$), renal dialysis ($P<0.001$), family history of dialysis ($P=0.005$), and tattooing ($P=0.040$). Lack of vaccination (87%) and prior dental procedures (56.7%) were common risk exposures. **Novelty:** The study provides updated hospital-based evidence integrating serological screening with detailed evaluation of demographic, medical, and behavioral determinants in a urological surgical population. **Implications:** Findings support routine preoperative screening and reinforcement of vaccination and infection control strategies to reduce occupational transmission in surgical settings.

Keywords: Preoperative Screening, Hepatitis B Virus, Hepatitis C Virus, HIV Infection, Seroprevalence

Key Findings Highlights:

Overall infection rate reached 8.7% among elective surgical candidates.

Transfusion, dialysis exposure, and tattoo history showed statistical association with positive serology.

Absence of immunization was highly prevalent within the studied population.

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Introduction

Hepatitis B and C are infections of the liver caused by the hepatitis B and C virus. The infection can be acute (short and severe) or chronic (long-term). Hepatitis B and C can cause a chronic infection and put people at high risk of death from cirrhosis and liver cancer.

Another infection caused by the Human immunodeficiency virus (HIV) is a virus that attacks the body's immune system. Acquired immunodeficiency syndrome (AIDS) occurs at the most advanced stage of infection.

HIV targets the body's white blood cells, weakening the immune system. This makes it easier to get sick with diseases like tuberculosis, infections, and some cancers. [WHO]

Healthcare workers are frequently exposed by a mucosal-cutaneous or percutaneous route to accidental contact with human blood and other potentially infectious biological materials while carrying out their occupational duties. Mucosal-cutaneous exposure occurs when the biological material of a potentially infected patient accidentally comes in contact with the mucous membranes of the eyes or mouth or with the skin of a healthcare worker. Percutaneous exposure occurs when an operator accidentally injures himself with a sharp, contaminated object, like a needle, blade or other sharp medical instrument. About 75% of the total occupational exposure is percutaneous, and 25% mucosal-cutaneous. The risk of infecting a healthcare worker is higher in percutaneous than in mucosal-cutaneous exposure. All healthcare workers should be considered for HBV vaccination and should meticulously apply the universal prophylactic measures to prevent exposure to HBV, HCV, and HIV. [4]

The prevalence of HBV among health-care workers is two to four times higher than that of the general population. [5] The higher prevalence of such infections among HCWs results from accidental sharp injuries (ASI) with infected needles or other sharp instruments. [5]

The prevalence of HCV infection was found in nurses (3%) and physicians/surgeons (5%) in comparison to the other healthcare worker categories. An important result of a study was that in the 10-year survey, there were no new infections by HCV in the monitored workers. This result stresses the concept that the correct handling procedures of hazardous biological materials and the use of personal protective equipment led to a reduction or a total avoidance of the risk of infection due to biohazard material [6]

In recent years, testing for the hepatitis virus and HIV has become common in medical institutions as a pre-operative screening test for medical safety. 2

According to the data provided by the World Health Organization [WHO], there are approximately 36 million healthcare workers worldwide, of whom around 3 million per year receive an injury with a sharp instrument, thus resulting in 2000000 subjects contaminated with HBV and 1000000 with HCV. Other studies estimated that the incidence of injuries to healthcare workers caused by sharp objects ranges from 1.4 to 9.5 per 100 healthcare workers per year, resulting in 0.42 HBV infections per 100 sharp-object injuries per year. [3]

Health Care Workers incur about 2 million needle stick injuries (NSIs) per year that result in infections with hepatitis B and C and HIV. The World Health Organization estimates that the global burden of disease from occupational exposure is around 40% of the hepatitis B and C infections and 2.5% of the HIV infections. [7]

The risk of infection in highly endemic regions from needle-stick and sharps injuries varies between 0.2 and 0.5% for HIV and increases up to 3-10% for HCV and 40% for HBV.

Previous studies have investigated the prevalence of HIV among Health Care Workers (HCWs) and revealed a relatively high rate of HIV and AIDS estimated at 15.7% [95% confidence interval (CI): [12.2-19.9%] among HCWs employed in the public and private health facilities [5]. These findings highlight HCWs as a high-risk population to be considered in the fight against HIV and AIDS, as they are in contact with patients and they're continuously exposed to occupational hazards during the course of their duty. [7]

Acute HCV infections are usually asymptomatic, and most do not lead to a life-threatening disease. Around 30% of infected people spontaneously clear the virus within 6 months of infection without any treatment, remaining 70% of people will develop chronic HCV infection of those with chronic HCV infection. The risk of cirrhosis ranges from 15% to 30% within 20year while 13 % of those with hepatitis B aware of their infection and other 3% developed chronic infection were on treatment. [WHO]

Those viruses can spread through contact with infected body fluids like blood, saliva, vaginal fluids, and semen, sharing contaminated needles or syringes. It can also be passed from a mother to her baby specifically hepatitis B virus and HIV. [WHO]

The most common mode of transmission of HBV, HCV, and HIV during health-care work activities is particularly through sharp injuries. A considerable proportion of HCV and HIV infected patients do not show clinical manifestations which further increase the risk of occupational transmission. As a result, accidental contact with the infected material was previously very common. In fact, the World Health Organization [WHO] stated that in the European area only the percutaneous exposure

risk of HBV and HCV infections in the health-care workers is >450,000 cases of which 340,000 for HBV virus and 149,000 for HCV According to the current regulation, caution by all HCWs have to be applied with the patients with and without any diagnosed infections.[8]

Previous studies have reported that the incidence of occupational injuries among healthcare professionals ranges between 2 and 10 per 100 procedures, each associated with a potential risk of transmission of hepatitis B virus (HBV) or hepatitis C virus (HCV) [2]. It has been estimated that a general surgeon experiences approximately 0.8 sharp injuries per 100 hours of operative time, resulting in a lifetime risk of about 6.9% for acquiring hepatitis C infection [9]

Hepatitis B can be prevented with a safe and effective vaccine. The vaccine is typically administered soon after birth, with boosters given a few weeks later. It offers nearly 100% protection against the virus, while hepatitis C has no vaccination program, but it can be treated with antiviral medications. While HIV infection also has no vaccination program and antivirals when used just decrease viral overload. [WHO]

Methods

This was a cross-sectional study conducted at Basrah Teaching Hospital for the period from -January to June 2025.

The participants were interviewed using a special questionnaire at the surgical wards of the Urology department in Basra Teaching Hospital, which was visited twice weekly. All patients scheduled for elective surgery on the day following their visits were included until the sample size was reached. Serological testing for HBsAg, anti-HCV and HIV was performed in the laboratory of Basrah Teaching Hospital.

The statistical analysis was made using Statistical Package for Social Sciences (SPSS) version 27. Chi-squared test and Fisher's Exact tests were used to test the significance of the association between risk factors and seropositivity of viral hepatitis and HIV. Logistic regression analysis was used to determine the independent association. P-value <0.05 was considered statistically significant.

The following are the variables that were covered for each patient

information such as age, sex, educational level, marital status, occupation, and alcoholic intake history. Also information about history of exposure to certain risk factors of viral hepatitis such blood transfusion, drug intake, tattooing, renal dialysis

dental and surgical intervention and others

Results

3.1. Socio-demographic characteristics

Table 1 shows the socio-demographic characteristics of the study population (254). The studied population was nearly equally distributed according to age, while about three quarters (73%) of them were males. The majority were married (87%), and most of them (66.9%) were with low educational level.

Character	No.	%
Age (years)		
18 - 44	117	46.1
45 - 64	96	37.8
≥ 65	41	16.1
Sex		
Male	160	73.0
Female	94	37.0
Marital status		
Married	221	87
Unmarried	29	11.4
Divorced/Widowed	4	1.6
Education		
Illiterate/ Primary	170	66.9
Intermediate/Secondary	60	23.6
University &above	24	9.5
Occupation		
Unemployed, retired, student, housewife	120	47.2
Self-employed	75	29.5
Officials (Other than health workers)	37	14.6
Construction Workers	17	6.7
Health workers	5	2.0
Residence		
Urban	172	67.7
Rural	82	32.3
Total	254	100

Figure 1. **Table 1 Socio-demographic characteristics of the study population**

Risk factor	No.	%
History of non vaccination	221	87.0
Previous dental surgery	144	56.7
Previous surgery	95	37.4
Drugs intake	67	26.4
Tattoo	59	23.2
History of blood transfusion	51	20.1
Sharing shaving instrument	28	11
Alcohol intake	21	8.3
History of renal dialysis	6	2.4
History of hepatitis	5	2
Family history of renal dialysis	5	2
Total	702	276.5

Table 1. **Table 2 Prevalence of risk factors among the study population**

Table 2 presents the risk factors among the studied patients. The most common factors were being not vaccinated against viral hepatitis (87%), previous dental surgery (56.7%), and history of previous surgery (37.4%). While the least prevalent factors were history of hepatitis and family history of renal dialysis (2% and 2% respectively).

Type of viral infection	No.	%
Viral hepatitis B	15	5.9
Viral hepatitis C	7	2.8
Either Viral hepatitis B or C	22	8.7
HIV	0	0
HIV with either hepatitis	0	0

Table 2. **Table 3 Sero-prevalence of viral infections among the study population**

As shown in table 3, the seroprevalence of HBV (5.9%) was higher than HCV prevalence which was 2.8%. The overall seroprevalence of either hepatitis B or C was 8.7% while HIV was zero

Risk factor	+ve Viral Hepatitis No. (%)	-ve Viral hepatitis No. (%)	HIV -ve	Total No. (%)	X ² ; P-value
Blood transfusion					
Absent	14 (6.9)	189 (93.1)	0	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)	0	203 (100)	FET 4.537; 0.098
1 – 3 times	7 (15.6)	38 (84.4)		45 (100)	
4 times & more	1 (16.0)	5 (83.0)		6 (100)	
History of hepatitis					
No	3 (8.1)	34 (91.9)	0	37 (100)	0.835; 0.659
Do not know	18 (8.5)	194 (91.5)		212 (100)	
Yes	1 (20.0)	4 (80)		5 (100)	
Previous surgery					
No	10 (6.3)	149 (93.7)	0	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)	0	110 (100)	8.636; 0.003
Yes	19 (13.2)	125 (86.8)		144 (100)	
Vaccination					
No	16 (7.2)	205 (92.8)	0	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)	0	248 (100)	FET; < 0.001
Yes	6 (100)	0 (0.0)		6 (100)	
Family history of dialysis					
No	19 (7.6)	230 (92.4)	0	249 (100)	FET; 0.005
Yes	3 (60.0)	2 (40.0)		5 (100)	
Total	22 (8.7)	232 (91.3)	0	254 (100)	

Figure 2. **Table 4 Association of medical conditions with Sero-positivity of either viral hepatitis B or C and HIV**

Table 4 presents the association between seropositivity of viral infection with certain medical conditions. Blood transfusion was significantly related to high seropositivity (P=0.046). The seroprevalence of either HBsAg or Anti HVC increased with increasing number of blood transfusion but without significant association. Patients with previous history of hepatitis showed higher rate of seropositivity compared with those with negative history but the association was also not significant.

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 difference 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.

Personal as well as family history of renal dialysis were found to be significantly related to high seroprevalence of hepatitis B and C.

While HIV has no significant relation with all risk factor.

Risk factor	+ve Viral Hepatitis No.(%)	-ve Viral hepatitis No. (%)	-ve HIV	Total No. (%)	X ² ; P-value
Sharing shaving instruments					
No	18(8.0)	208(92.0)	0	226(100)	1.268;
Yes	4(14.3)	24(85.7)		28(100)	0.262
Tattooing					
No	13(6.7)	182(93.3)	0	195(100)	4.222
Yes	9(15.3)	50(84.7)		59(100)	0.040
Alcohol intake					
No	18 (7.7)	215 (92.3)	0	233 (100)	3.122;
Yes	4 (19.0)	17 (81.0)		21 (100)	0.077
Drugs intake					
No	17 (9.1)	170 (90.9)	0	187 (100)	0.165;
Yes	5 (7.5)	62 (92.5)		67 (100)	0.684
Total	22 (8.7)	232 (91.3)	0	254(100)	

Figure 3. **Table 5 Association of behavioral factors with Sero-positivity with either viral hepatitis B or C and HIV**

As shown in table 5, patients who shared shaving instruments had higher seroprevalence of viral hepatitis compared with those who did not share the shaving instruments (14.3% vs. 8%) but without significant association, where as people who experienced tattooing were significantly at higher risk of seropositivity 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. No significant association was found between drugs intake and viral hepatitis seropositivity HIV no significant association with all behavioral factor.

Discussion

In study majority of participant are male married and low education this may be due to collected sample from urology department where most patients are male having prostate and bladder problem. Table 1

The most common risk factors in this study were being not vaccinated against viral hepatitis (87%), previous dental surgery (56.7%), and history of previous surgery (37.4%) (Table 2) this similar to study in the Egypt where not vaccinated (84.1%)then pervious surgery(77%) and dental intervention (76.8%) [10]. This may be related to education of study population where most of them low education (Table 1) not care about vaccination program from other hand higher surgical intervention may related to the wars in Iraq.

The overall seroprevalence of preoperative patients was 8.7%. Hepatitis B was the most commonly detected infection 5.9% this higher prevalence related to low vaccination coverage and sociocultural factors followed by Hepatitis C 2.8% and HIV zero that is because social, religious and cultural factors. (Table3) These findings comparable hospital base study in India at 2022[11] which show HBV (1.54%) and HCV (0.74%) while HIV higher than our study(0.2).

In contrast, a study in the Egypt reported a markedly higher prevalence of HCV (16.4 %) compared with HBV and HIV respectively (1.4%) (0.7%).[10]

Anther Indian study show similar results HBV (1.88%) HCV (1.05%) HIV(0).[11]

A history of renal dialysis was found to be significantly related to viral hepatitis seropositivity (P< 0.001), Similar finding have been reported by study in Somalia and Jordan [12,13]. This may be due to sharing contaminated machine and prolong exposure to blood product.

Other significant associations include blood transfusion , pervious surgical and dental interventions(table4) and tattooing (table5) these finding similar to study in Ethiopia, which suggested that such association may result from invasive procedure performed under suboptimal sterilization conditions in low and middle income country.[14] additionally , a study from Syria reported a significant association with blood transfusion and dental interventions while no significant association was observed with surgical intervention.[15]

Conclusion

The present study revealed a relatively high seroprevalence of viral hepatitis among pre-operative patients, comparable to that reported in other developing countries. Hepatitis B infection was more prevalent than hepatitis C and HIV in the studied population. Several risk factors were frequently identified, including lack of vaccination against hepatitis B, previous

dental and surgical interventions, drug use, and tattooing, indicating ongoing exposure to blood-borne transmission routes. In addition, healthcare workers were identified as a major occupational risk group for viral hepatitis.

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