

Proportion of hepatitis C virus antibodies in icteric patients

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الخلاصة

تم فحص ١٧٨٣ مصل جمعت من مصابين باليرقان (٩٨٨ ذكر، ٧٩٥ أنثى) أعمارهم تتراوح بين ٨-٥٤ سنة للتحري عن دلالات لوجود علامات الإصابة بفيروسات التهاب الكبد نوع A, B, C, باستعمال العدد المتوفرة (ELISA). كما تم فحص ٣٠٠ مصل من أشخاص أصحاء من المتبرعين بالدم واعتبرت كمجموعة ضابطة. لقد تبين من النتائج إن ٨٥٩ (٤٨,٢%) حالة لديهم دلالة عن الإصابة بالتهاب الكبد الفيروسي الحاد نوع A و ٤٩٩ (٢٨%) حالة مصابة بالتهاب الكبد الفيروسي نوع B. أما مستضدات فايرس التهاب الكبد نوع C فلقد شخصت في ٨,٢% من الحالات أيده فحص (RIBA). أثبتت نتائج البحث إن أعلى نسبة لانتشار مستضدات فايرس التهاب الكبد نوع C وجدت لدى المرضى التي أعمارهم أكثر من ٣٠ سنة. كما وجد انه لا توجد علاقة بين جنس المرضى و الإصابة بهذا الفايرس. وجدت علاقة بين الإصابة بفايرس التهاب الكبد نوع C ونقل الدم أو إجراء العمليات الكبرى، وهذا يعكس حقيقة إن دم المتبرعين ربما يحتوي على فايرس التهاب الكبد نوع C والذي لم يتم الكشف عنه بالطرق السيرولوجية المتبعة في مصرف الدم. تدعو الحاجة إلى معرفة وتشخيص حاملي هذا الفايرس بطرق مختبرية ذات حساسية وخصوصية عاليتين، والاهتمام بالأشخاص اللذين يعملون في المجال الطبي فيما يخص نقل المرض طبيًا. بالإضافة إلى الحاجة لتثبيث ومعرفة انتقال المرض بالطرق الأخرى بين الأشخاص وتشخيص هذا الفايرس بالاعتماد على تحليل التتابع الجزيئي لجينات هذا الفايرس.

ABSTRACT

A total of 1783 sera from icteric patients (988 male & 795 female), their ages ranged 8-54 years, were tested for the presence of viral hepatitis markers (hepatitis A, B, and C), using the available diagnostic kits (enzyme linked immunosorbant assay). 300 donor sera were also tested as matched control. Among the icteric patients 859 (48,2%) had evidence of acute hepatitis A (HA), 499 (28%) were found to be infected with hepatitis B (HB), and hepatitis C virus (HCV-Ab) was detected in 8.2% of patients that confirmed by recombinant immunoblot assay. The results indicated that the maximum HCV seroprevalence was found in patients more than 30 years old, and there was no difference in the chance of infection in both sexes. The main route of HCV transmission was observed in icteric patients who had received blood, and those underwent surgical intervention. These reflect the fact that some of transfused blood may contain HCV that could not be detected by routine serological tests used in Blood Bank. There is a need to identify HCV carriers and the increased awareness of medical and paramedical personnel regarding the risk of transmitting the disease iatrogenically. Furthermore the need to document the risk of nosocomial transmission and highlight the crucial role of molecular sequence based phylogenetic analysis of cloned viral isolates in the investigation of HCV infection.

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INTRODUCTION :

Viral hepatitis is considered to be one of the most common complication of blood transfusion⁽¹⁾. Hepatitis C (HC) is the name given to the most frequently reported type of transfusion transmitted hepatitis formerly known as non A non B (NANB) hepatitis^(2,3,4,5).

It is now widely accepted that 85% or more of individuals with acute HCV infection progress to chronic hepatitis, and those carriers may be infectious for years⁽⁶⁾. Moreover, chronic HC is a known risk factor for cirrhosis and hepatocellular carcinoma^(7,8).

In a remarkable display of the power of clinical investigation, many important observations have been made^(8,9,10).

The present study determined the prevalence of HCV antibodies in sera collected from Iraqi icteric patients using a commercial enzyme immunoassay (ELISA), and confirm reactive screening results using recombinant immunoblot

assay (RIBA). In this study we try to shed some light on the probable risk factors in HCV infected patients.

MATERIALS AND METHODS :

Patients: The study population consisted of 1783 icteric patients (988 males & 795 females) who were seen through the Clinics of the Departments of Medicine and Infectious Diseases, and they were referred to Central Public Health Lab./Ministry of Health, during a two-year period (1996&1998), for the detection of viral hepatitis serological markers. Patients ages ranged from 8-54 years. All patients were questioned with regard to the source of infection. Serum samples were collected from each patient and stored at -20 C until tested. Other 300 serum samples were included, they were selected randomly from blood donors (19-51 years), at the Blood Donation Center and considered as a healthy matched control group.

Serological Assays: Using commercially available Enzyme-Linked Immunosorbent Assay (ELISA), different hepatitis markers were detected in sera of patients and controls. Hepanostika Microelisa system (Organon-Teknika) was used for the detection of serum antibody to hepatitis A virus of the IgM class (anti-HAV IgM); hepatitis B surface antigen and antibody (HBs Ag & Ab); and serum antibody to hepatitis B core antigen (anti-HBc total). Monolisa anti-HCV plus (Sanofi Pasteur) was used for the detection of antibody to hepatitis C virus (anti-HCV Ab). HCV positive sera in ELISA were tested by Recombinant Immunoblot Assay (RIBA) which was obtained from Organon-Teknika (Lia Tek 111). The test visualizes antibodies specific to HCV proteins using recombinant antigens.

RESULTS :

As shown in table (1) hepatitis markers were diagnosed in 1504 (84.4%) icteric patients. Hepatitis A,B,C serological markers were detected in the sera of 84.2% (859), 28% (499), and 8.2% (146) of the icteric patients respectively. The diagnosis of hepatitis markers was established in 9 subjects (3%) of the control group.

Icteric patients proved to be infected with HCV (146) were grouped into six groups in 10 years span, the results presented in figure 1 shows that, HCV infection was uncommon in young age groups and the major rise in the percentage of seropositive cases occurred at age more than 30 years; while anti-HCV Ab was diagnosed in 2 (0.7%) of the control group, and their ages ranging from 40-49 years (100%). There was no difference in the chance of infection in both sexes.

Risk factors elicited from icteric patients proved to have HC marker are displayed in table (2).

The main probable source of HCV infection was after blood transfusion 89 (61%). A high percentage 32 (22%) was also found among positive cases after surgery intervention. 12.3% of HCV positive cases was found among patients had dental treatment 3-6 months ago. Unknown reason for HCV infection was found in 4.8% of cases. Most female patients had previous surgical intervention.

Table 1 . Incidence of hepatitis markers in icteric patients and controls.

Hepatitis markers *	Icteric patients (No=1783)		Control group (No=300)	
	No.positive	(%)	No.positive	(%)
Hepatitis A	859	(48.2)	2	(0.7)
Hepatitis B	499	(28)	5**	(1.7)
Hepatitis C	146	(8.2)	2	(0.7)
Total	1504	(84.4)	9	(3)

*: Hepatitis markers
 HAV-IgM
 HBs-antigen & antibody
 Anti-HBc total
 HCV-antibody
 **:Only HBs antigen

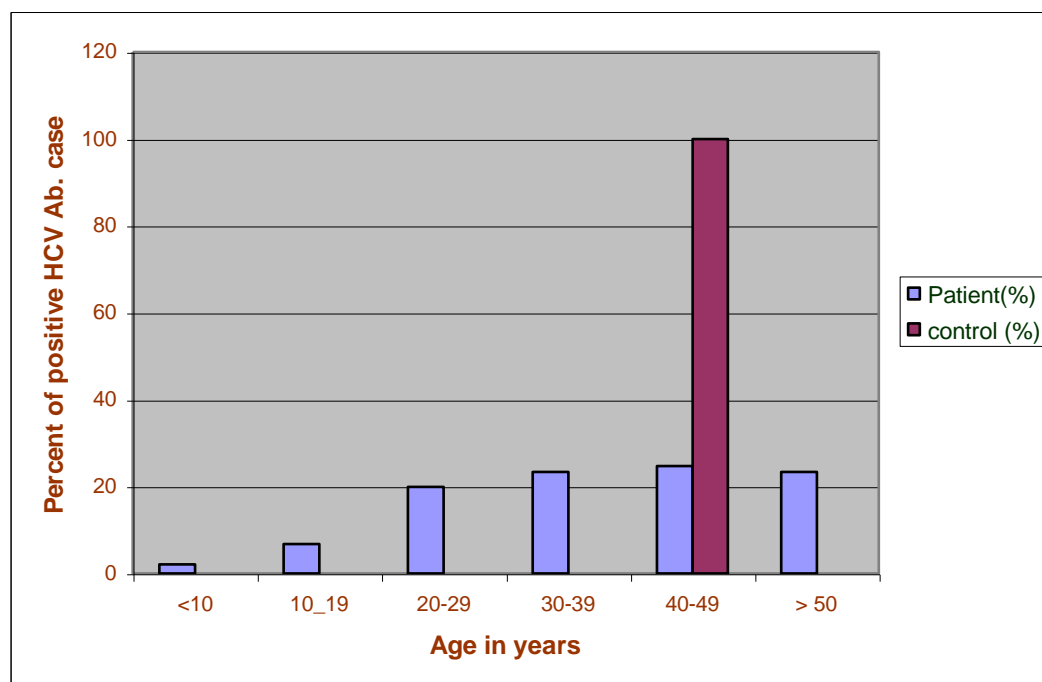


Figure 1. Age Distribution Of Patients & Controls Proved To Have HCV Ab.

Table 2 . Risk factors elicited from icteric patients proved to have HCV infection.

Risk factors	HCV Ab (No=146)	
	No.positive	(%)
Blood transfusion	89	(61)
Surgery intervention	32	(22)
Dental treatment	18	(12.3)
Unknown	7	(4.8)

Information were not available about past history of risk factors in blood donors (control group) .

DISCUSSION :

Fortunately the diagnosis of acute hepatitis A can now be quickly established by the presence of IgM specific antibodies in the serum, that allows to distinguish acute hepatitis A from past infection⁽¹¹⁾. 48.2% of icteric patents were found positive for HAV-IgM (table 1), this result is comparable to our previous finding⁽¹²⁾. On the other hand the percentage is higher than that reported by other investigators^(13,14). This could be due to the decrepitude in the hygienic foundation facilities or due to patients habitation.

Acute HBV infections constitutes in 28% of icteric patients which is in comparable with the results observed during 1998 and 1999^(13,15). A recent observation⁽¹⁴⁾ revealed a decline in the percentage. It is clear that a decrease in the percentage of people infected with HBV since 1998 until 2000, may be due to the application of vaccination programs, and the use of a new generations of the serodiagnostic kits represented by high specificity and sensitivity for the accurate serodiagnosis of transfused blood.

HCV infections constitute 8.2% of icteric cases (study period 1996-1998), this is higher than the figure produced recently⁽¹⁴⁾. The possible reason for the apparent discrepancy is that the type of antibody tested apart from that it has been documented that antibodies to HCV appear relatively late in the course of the infection, and if clinical suspicion is high (history of blood transfusion or surgery), the patient's serum should be tested for HCV RNA to establish the diagnosis⁽¹⁶⁾.

The maximum seroprevalence was found in patients more than 30 years old (figure 1). This finding confirm that most patients diagnosed with HCV are young and middle-aged adults^(17,18). This reflect an increased exposure to HCV transmission in older age groups. Higher frequency of HCV infection was reported among men^(18,19), we observed that no difference in the chance of infection in both sexes, this may be attributed to that many of our female subjects had past transfusion.

Out of 1783 icteric patients only 1504 were found to be positive for hepatitis markers (HAV, HBV, HCV), other icteric cases that showed negative result might be due to other diseases that damaging the liver or may attributed to hepatic infection with other pathogens like bacteria, parasite, or fungi⁽²⁰⁾. It is possible also that a small proportion of non-hepatotropic viruses, contributed to the appearance of clinical symptoms⁽²¹⁾. Recently discovered hepatitis viruses

like HE, F, G, might be count for certain percentage of negative cases that was unfortunately not detected at the time of testing^(10,22). Furthermore, jundice resulting from herbs, chemotherapeutic agents, or alcohol also occurs frequently⁽²³⁾.

In blood donor group a low percentage (0.3%) of positive cases was found, this could be explained by the low prevalence of HB, and HC in Iraqi blood donors⁽²⁴⁾.

The main route of HCV transmission is parenteral and most infected individuals are either blood recipients or intravenous drug users^(9,17). Transfused blood is now screened for HCV in most countries, this has virtually eliminated post-transfusion HCV^(9,18). We observed an association between HCV seroprevalence in icteric patients and past-history of blood transfusion, also 22% of HCV seropositive patients were had surgical intervention within a period of three months, however most of those patients had received blood during the intervention. HCV infection has been described among patients who underwent surgical intervention^(25,26).

It was noted that the prevalence of HCV marker was high in Iraqi patients received blood transfusion^(27,28,29). This reflect the fact that some of transfused blood may contain HCV that could not be detected by the routine serological tests used in Blood Bank.

As far as other risk factors concern, 12.3% of anti-HCV positive icteric patients had dental treatment 2-6 months ago, and unknown reason for HCV infection was observed in 4.8% of cases. Household or sexual exposure to a contact who had hepatitis were found as a significant risk factors for acquiring HCV⁽³⁰⁾.

Further studies of the prevalence of other parenteral risk factor such as frequent past-injection treatment among blood donors are needed, in addition there is an obvious need for sensitive screening tests for every blood-borne virus that threatens the safety of blood, especially screening to identify carriers of HCV, and the increased awareness of medical and paramedical personnel regarding the risk of transmitting the disease iatrogenically. Furthermore the need to document the risk of nosocomial transmission and the importance of infection control procedures, and highlights the crucial role of molecular sequence based phylogenetic analysis of cloned viral isolates in the investigation of HCV infection.

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