USE ELISA TECHNIQUE TO DETECT VIRAL HEPATITIS IN THI-QAR PROVINCE : A RETROSPECTIVE STUDY

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ABSTRACT

This study reports the prevalence of hepatitis A Virus (HAV), hepatitis B virus (HBV) and C virus (HCV), and the frequency of potential exposure to these viruses among patients were admitted to Hormones laboratory in Al-Hussain teaching hospital /Thi-Qar province. Serum samples were tested for HAV , HBV markers and antibodies to HCV by enzyme-linked immunosorbent assay (ELISA).

From the results of the present study , 2775 patients were tested, divided into tow groups. Group A included the catheter patient and other group (Group B) included outpatient. Results showed no positive result for anti- HAV. While, Anti-HBs were positive 4 cases and 6 cases for group A and group B respectively. Contrast, anti- HCV were positive 2 cases for group A and 5 cases for group B. Statistically significant observation $P<0.05$ between the two groups, Group B was the highest sensitive to Hepatitis B,C infection than group A .

Background: Diagnosis is a vital decision point at which adequate evidence has to be accumulated to get a clear clinical picture about the patient before initiation of the treatment . Laboratory tests for hepatitis are very critical for the physician to confirm his findings about the clinical condition of the patient because of several causative agents of the disease. Hepatitis being caused by the virus A,B,C diagnosis is even more complicated as all of them present similar symptoms. Therefore, laboratory testing is important to identify the exact causative virus so that the appropriate treatment can be initiated accordingly.

INTRODUCTION:

"Hepatitis" means inflammation of the liver. Toxins, certain drugs, some diseases, heavy alcohol use, and bacterial and viral infections can all cause hepatitis. Hepatitis is also the name of a family of viral infections that affect the liver (CDC,2009). Hepatitis is most often caused by one of several viruses, which is why it is often called viral hepatitis. The most common types of viral hepatitis are hepatitis A, hepatitis B and hepatitis C. Hepatitis A only causes acute infection. Hepatitis viruses B and C can cause both acute and chronic infections, Chronic hepatitis B and C are serious health problems (Jorgensen, 2010). Infection with Hepatitis A being self limiting was never a fatal disease . While, hepatitis B virus (HBV) and hepatitis C virus (HCV) infections are among the most threatening health problems in the world (Kane *et al.*,1999) Hepatitis B virus (HBV) is a major cause of acute and chronic hepatitis worldwide, and hepatocellular carcinoma, it is estimated to cause more than 1 million deaths each year (Greenwood *et al.*,2007). Up to 80% of patients infected with HCV

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become chronically infected and most of these patients will show evidence of chronic hepatitis (Hutchinson *et al.*,2005). Hepatitis C is usually slowly progressive over a period of many years. Five to 15% of patients with chronic hepatitis may progress to liver cirrhosis over 20 years (Freeman *et al.*,2001). Most cases of hepatitis can be spread to other people by sexual contact or by contact with stool, urine, blood or other body fluids of an infected person (www.healthinfotranslations.com.,2007).

The aim of this study is to determine the prevalence of HAC, HBV and HCV by using ELISA for patients were admitted to Hormones laboratory in Al-Hussain teaching hospital /Thi-Qar province,.

MATERIALS & METHODS

Patients: Laboratory diagnosed viral hepatitis in symptomatic patient were admitted to Hormones laboratory in Al-Hussain teaching hospital /Thi-Qar province, were evaluated retrospectively over a period of 10 months (May 2010 – February 2011) . The study was conducted by reviewing laboratory log books in the above mentioned hospital .

Specimens: Collect serum or plasma specimens following regular clinical laboratory procedures. Separate the serum from the clot or plasma from the red cells as soon as possible to avoid hemolysis ,centerfuged at 3000 rpm. for 45 min. and the sera stored at -20ºC until used in the assay . Assay process can be performed manually or automatic ELA microplate immuno-analyzer. In HAV ,HBV and HCV were assayed by ELISA method based on double antibody sandwich technique. Hepatitis infections are diagnosed with blood tests that look for parts of the virus or antibodies which body makes in response to the virus according to the table (1)

Statistical analysis : The collected data were recorded and analyzed using descriptive statistical methods. percentage for each HAV,HBV,HCV carried out.

Results:

Table 2: Shows the total patients samples were 2775 patients under study, divided into two groups. Group A included the catheter patients (1913 patients) .The other group (Group B) included outpatients (862 patients).

This table shows no positive result for anti-HAV for 0 patients for group A and 6 patients for Group B . While, Anti-HBs were carried out for 949 patients for Group A and 403 patients for Group B, 4 cases (2 male and 2 female) and 6 cases (male) were positive for Group A and Group B respectively. Contrast, anti- HCV were carried out for 964 patients for Group A and 455 patients for Group B, 2 cases (male) and 5 cases (male) were positive for Group A and Group B respectively .

The percentage for positive cases for ELISA test , showed a high percentage for anti-HCV was (1.09%) for group B contrast, (0.20%) for group A . Also, anti-HBs was a high percentage for group B (1.48%) contrast, (0.42%) for group A (table 3).

There were statistically significant observation $P<0.05$ between the two groups, Group B was the highest sensitive to Hepatitis B,C infection than group A (Fiuger 1).

Discussion:

Infection with Hepatitis A was never a fatal disease. The situation is more complicated in HBV & HCV because of its fatality. Both HBV & HCV can produce a

wide spectrum of liver disease, from subclinical carries state to severe or fulminant acute, hepatitis lead to serious liver damage or cancer (CDC,2002a ; CDC,2002b) . Five to 10% of all patients with HBV develop chronic hepatitis or become inactive carrier, where as HCV has the highest rate of chronicity ,Cirrhosis can develop in both cases and hepatocellular carcinoma can ultimately develop in chronic infection and 40% of population has lifetime risk of death (Harvey *et al.*,2007 ; Dienstag, 2008 ; TenCate *et al.*,2010).

From the results of the present study , 2775 patients were tested, no positive result was observed for anti-HAV. While, 4 cases and 6 cases were positive for Anti-HBs for group A and group B respectively. Contrast, anti- HCV were positive 2 cases for group A and 5 cases for group B . This study has shown Group B was the highest sensitive to Hepatitis B,C infection than group A .These result agreed with some reports **(**Wang *et al.***,**2002 ; Jack *et al.*,2007)

We observed an increased mortality among outpatients with chronic HBV & HCV-infection compared to catheter patients with cleared infection, based on ELISA testing. It was also found that the distribution of Hepatitis disease in this study was more in male than female patients with significant difference special group B when $p<0.05$ for anti-HBs and $p<0.025$ for group Abut no significant difference for group A. Therefore, risk factors for HBV and HCV were different in these province patients .

To our knowledge, no previous study has addressed the impact of chronic hepatitis, So our study has several limitations. We had access to the exact date of Hepatitis diagnosis, but not the date of Hepatitis infection, and most Hepatitis infections occur subclinically . Spread of Hepatitis B and C among patients in our study might be attributed to contact with the blood of an infected person blood transfusions and organ transplants, the sharing of needles, syringes and other injecting-related equipment, hepatitis C is the most common infectious disease among people who inject drugs (E.H.R.N.,2007). The risk of cirrhosis correlates strongly with alcohol drinking (Klatsky & Armstrong,1992). Therefore, Safe medical injections and improved health education for high-risk groups are imperative for preventing Hepatitis B and C transmission and get vaccinated against hepatitis and patients must stopping drinking of alcohol.

Conclusion:

Diagnosis of acute viral hepatitis can no longer be restricted to detection of only HBV by HBs Ag test as is the practice. HCV is also a growing hazard which can be damaging or fatal in chronic cases. It is necessary to screen a patient for HAV, HBV and HCV as a first line approach in diagnosing acute viral hepatitis and putting him or her on to a correct course of treatment. ELISA test are available in a rapid format with good sensitivity, specificity and are simple to perform.With the availability of these tests medical practitioners can easily pin point the exact causative pathogen without having to wait to decide the correct line of treatment.

Tables and Figures:

Table 1: Immunological tests

Test Markers	Hepatitis A	Hepatitis E	Hepatitis B	Hepatitis C	Remarks
Anti HAV IgM	+				HAV infection
Anti HEV IgM		+			HEV infection
HBsAg Anti HBc			+ -		Suspected HBV infection, repeat after one month
HBsAg Anti HBc			+ +		Confirmed HBV infection
HBsAg Anti HBc			- +		Confirmed HBV exposure or HBV infection with remission of HBsAg
Anti HCV				+ / -*	HCV exposure or infection

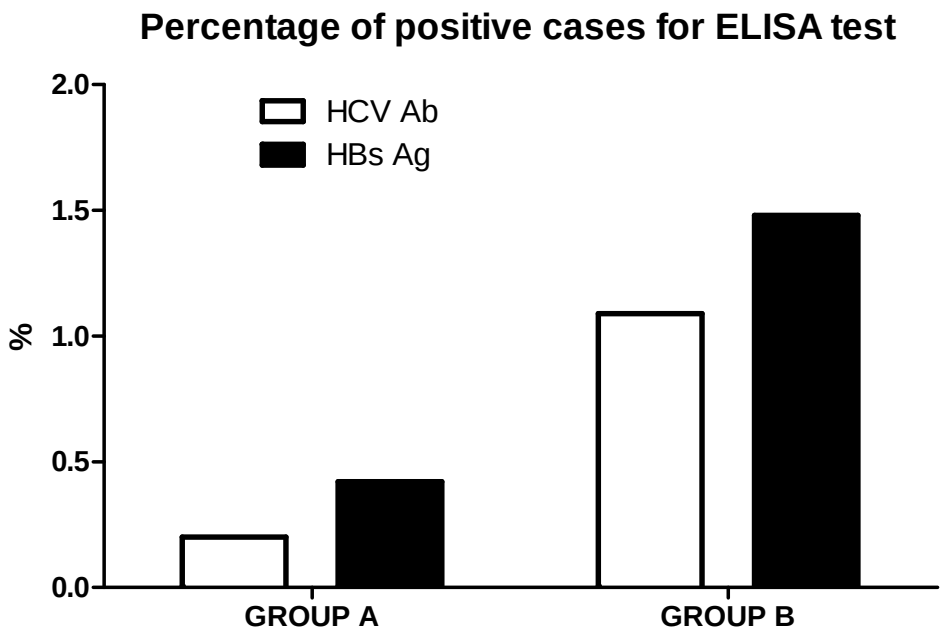
In the initial phase of acute hepatitis C, antibodies to HCV detection may be negative due its prolonged serological window period. Repeat the test after 90 days if suspected. *

Table 2: Total number and distribution of 2775 patients and test marker for viral hepatitis

Test marker	Group A					Group B				
	Distribution of Tested patients		postive		Total No.	Distribution of Tested patients		postive		Total No.
	male	female	male	female		male	female	male	female	
HAV IgM	0	0	0	0	0	3	3	0	0	6
HBs Ag	805	144	2	2	949	279	122	6	0	401
HCV Ab	822	142	2	0	964	255	200	5	0	455
Total No.					1913					862

Table 3: Percentage of positive cases for ELISA test

Test	Group A	Group B
	%	%
HCV Ab	0.20	1.09
HBs Ag	0.42	1.49



Fiuger 1: Percentage of positive cases for Group A and Group B for HBs Ag and HCV Ab marker

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دراسة ارتجاعية حول إستعمالْ تقنيةَ الاجسام المناعية المرتبطة بالانزيم لإكتِشاف إلتهابِ الكبد الفيروسي في محافظةِ ذي قار

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أستهدفت الدراسة الحاليةِ إلتهاب الكبد الفيروسي بانواعه (أ،ب،س)وتردد التعرّضِ لهذه الفيروساتِ بين المرضى المراجعين لمختبر الهورموناتِ في مستشفى الحسين التعليمي / محافظة ذي قار. تم فحص عينات المصل باستخدامِ طريقة الاجسام المناعية المرتبطة بالانزيم . تبين من الدراسةِ،أن ٢٧٧١ مريض قسموا الى مجموعتين الاولى تشمل مرضى القسطرة والثانية تشمل المراجعين الخارجيين، بينت النتائج أنه لاتوجد حالات موجبة للالتهاب الكبدي الفيروسي نوع أ ضمن الدراسة الحاليةَ، بينما كان هنالك اربعة حالات أيجابية لالتهاب الكبد الفيروسي نوع ب وستة حالات لالتهاب الكبد الفيروسي نوع س للمجموعتين الاولى والثانية على التوالي و حالتين أيجابيتين للمجموعة الاولى وخمسة حالات للمجموعة الثانية للالتهاب الكبدي الفيروسي نوع س على التوالي. المجموعة الثانية كانت اكثر حساسية للاصابة بالتهاب الكبد الفيروسي مقارنة مع المجموعة الاولى وبفارق معنوي .

*فرع الاحياء الدقيقة /كلية الطب /جامعة ذي قار