

PREVALENCE OF HBV AND HCV IN BLOOD DONORS IN MOSUL CITY⁺

انتشار التهاب الكبد الفيروسي نمط (B.C) بين متبرعي الدم في مدينة الموصل

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Abstract:

Hepatitis is disease of the liver caused by the infectious and non-infectious agents. The aim of study was to analyze the prevalence of HBV and HCV among voluntary blood donors in Mosul, during 2008-2009. The data from blood bank Center for Blood Transfusion of Mosul were collected and analyzed through descriptive and comparative epidemiological method of retrospective study. All samples were tested by ELISA test. Out of 35540 samples of the blood donors, 475 were positive. From overall positive samples, 447 were HBV positive, 28 HCV positive. The HBV prevalence among the blood donors of Mosul is 1.2 %, while the HCV prevalence among the blood donors in Mosul is 0.07% this level of prevalence is relatively low. Age group 30–39 years old for HBV was presented with 55.8% of cases age group of HCV was not significant because sample size was very small .

المستخلص:

يعد التهاب الكبد الفيروسي من الأمراض التي تصيب الكبد بواسطة العوامل المعدية وغير المعدية ، هدفت الدراسة الى تبيان أنتشار التهاب الكبد نمط (ب) ونمط (ج) بين متبرعي الدم في مدينة الموصل خلال عام ٢٠٠٨-٢٠٠٩ تم مراجعة سجلات مصرف الدم بجمع معلومات عن المتبرعين المصابين بالتهاب الكبد الفيروسي نمط (ب) و (ج) حيث تم اخذ عينات الدم من مصرف نقل الدم المركزي في مدينة الموصل وأجراء الفحوصات على النماذج ، وأكدت الدراسة على توضيح وجهة المقارنة من الناحية الوبائية علما أن العينات التي تم اختبارها مختبريا بطريقة الاليزا المجموع الكلي لعينات متبرعي الدم هو (٣٥٥٤٠) نموذج ، حيث ٤٧٥ نموذج أعطى نتيجة موجبة من المجموع الكلي و أعداد المصابين بالتهاب الكبد الفيروسي نمط (ب) هو ٤٤٧ ، بينما ٢٨ حالة موجبة بالتهاب الكبد الفيروسي نمط (ج) . حيث أظهرت الدراسة بأن نسبة أنتشار التهاب الكبد الفيروسي نمط (ب) بين متبرعي الدم في مدينة الموصل هي ١,٢ % وهو يعد معدل لانتشار المرض بالنسبة للنواحي والاقضية التابعة للموصل طبقا لتصنيف مركز السيطرة على الامراض الأنتقالية مركزيا من الناحية الجغرافية ومدى انتشار مرض التهاب الكبد نمط (ب)، بينما كانت نسبة انتشار التهاب الكبد الفيروسي نمط (ج) بين متبرعي الدم في مدينة الموصل هو بنسبة ٠,٠٧ % وتعد هذه النسبة قليلة نسبيا. اما من حيث مجاميع الأعمار لمتبرعي الدم حيث أظهرت أعلى نسبة من الإصابة بمرض التهاب الكبد نمط (ب) للأعمار بين (٣٠-٣٩) سنة والتي بلغت

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٥٥,٨% ،بينما كانت نسب الإصابة بالتهاب الكبد نمط (ج) ذات نسبة ضئيلة حيث لا يمكن تحديد السن أو الفئة العمرية للمصابين .

Introduction:

Hepatitis is term to describe a nonspecific liver inflammation[1,2]. The known types of hepatitis: A, B, C, D, E, F, G and TT. Hepatitis B and C are classified as a similar types of liver infection, which are mostly spread through blood and blood products[3,4,5].

The possibility of hepatitis transmission through blood and blood products were known since 1950 [6,7,8,9].

Hepatitis B virus (HBV) is the smallest human DNA virus and has a very compact genome, belongs to the family Hepadnaviridae, which comprises a group of highly species – specific DNA virus [10]. Hepatitis C virus is an RNA virus with lipid coat similar to flaviviridae family.

Infected person or asymptomatic carriers with viral hepatitis B and C are only reservoir of infection [8,9,11,12,13].

Hepatitis is a systemic disease primarily involving ,the liver as main target for viral replication which characterized clinically by fever, jaundice and gastrointestinal symptoms [14].

However , HBV variants have been described with mutations in the precore region that prevent HBeAg synthesis .

The most common of these mutations is a guanine (G) to adinine (A) substitution at nucleotide 1896, that prevents the production of HBeAg by introducing a premature stop codon in to the open reading frame (ORF) of the precore region [15].

The presence of A 1896 mutation is thus restricted to genotypes that have a T at nucleotide 1858, as is the case for genotypes B,C,D and E .

Genotype A usually show a cytosine (C) at this position [16],While genotype F may present a T or a C [17] .

Hepatitis B virus infection is a global health problem, causes acute and Chronic hepatitis in humans.

Chronic HBV is usually defined as detectable hepatitis B surface antigenemia (HBsAg) for a period of six months or more [18]. Researches show as that world prevalence of HBsAg carriers is from 0.1% till 20% with high percentage in tropical countries [5,12].

Aim of study:

1. Determination the prevalence of HBsAg and anti-HCV antibodies among blood donors in Mosul during 2008-2009 by ELISA3.0 technique .
2. Measurement of viral marker among HBsAg positive donors .
3. As well as the prevalence of HBV and HCV was compared with the data available from other countries using the same diagnostic procedure .

Materials and methods:

The study conducted in central blood bank in Mosul during the period 2008-2009 from each voluntary blood donors atotal of 35540 samples,35114 males (98.8%) and 426 females (1.2%) included in this study, 10ml of blood was drawn from blood pint. The blood was placed in plane blood tubes, it was left to stand at room temperature (20-25c), to allow clot formation, then the sera were separated by centrifugation at 3000 rpm for 15 minutes, and divided in to aliquots (250 µl) and stored at (-20c) until examination.

Each aliquot of the serum used once to avoid thawing and freezing. All sera and reagent were allowed to stand at room temperature before use in the test .

Detection of HBV and detection of HBsAg by Enzyme Linked Immuno-Sorbent Assay (ELISA) test was used to screen all the samples, the test done in blood bank in Mosul .

Hepanostika HBsAg Uni-Form II is an ELISA for qualitative determination of HBsAg

subtype ad and ay in human serum.We followed the procedure and interpretation of result according the instructions. ELISA HBsAg confirmatory test .

Hepanostika HBsAg Uniform II confirmatory reagent was used for confirmation of HBsAg in specimens, we followed the procedure and interpreted of results according the manufactures instruction.

Results:

The results of the study showed that from a total of 35540 samples of the blood donated by volunteer blood donors, 475were positive for HBV and HCV, from overall positive samples, 447 were HBV positive, 28HCV positive,figure 1.

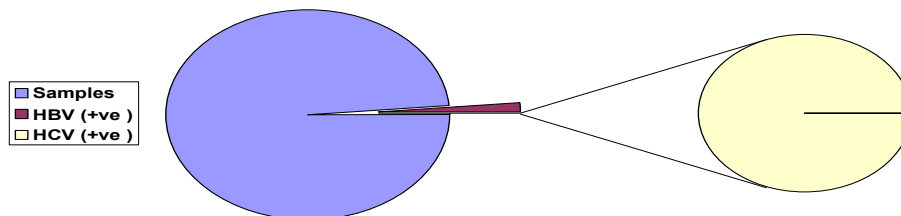


Fig.1Distribution of infected persons with Hepatitis B and C viruses, in blood donors in Mosul city during 2008-2009.

Viral hepatitis in blood donors mainly seen in males.HBV was detected in 1.2 % of males donors and in 0.03% of females donors from the positive cases .

Although HCV infection showed a little prevalence among blood donors. It was founded in 0.07% male of the donors while infection in female donors was absolutely absent as shown in table1 and figure2.

Table (1) Distribution of Hepatitis B Virus and Hepatitis C virus in blood donors according to gender.

Gender	Tested HBsAg	Prevalence %	Tested anti HCV	Prevalence %
Male	436	1.2 %	25	0.07%
Female	11	0.03%	3	0.0%
Total	447	1.258 %	28	0.078 %

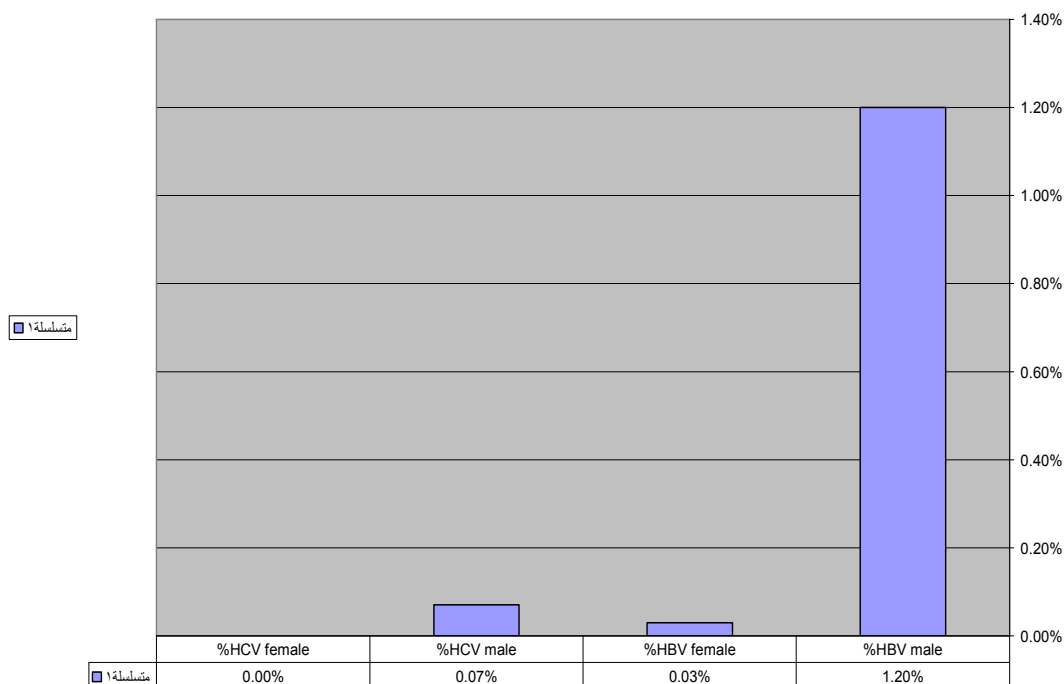


Fig.2 Infection with HBV & HCV among blood donors by type and sex .

Age distribution for hepatitis (B&C) in blood donors appear between the age (30-39) years which represent as 55.8%, whereas age group from 50-59 years is represented with 11.2%. The age (50-59) years the prevalence of viral hepatitis among this age group was less than other interval age group which represented with 11.2%, while persons with mean age (37.9 years with SD 8.1) present 11% from the total as shown in figure 3 & Tab. 2

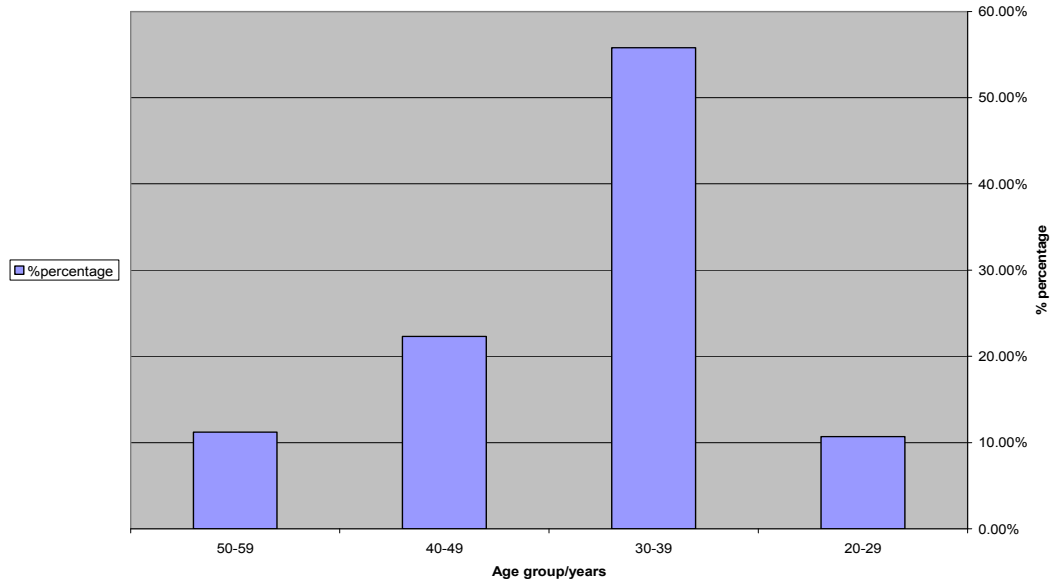


Fig. 3 percentage with infection HBV by age group and year .

Table(2) Distribution of HBV infection in blood donors according to age .

Age group/ Years	No.	% Percentage
20-29	47	10.7
30-39	250	55.8
40-49	100	22.3
50-59	50	11.2
Total Count	447	

Discussion:

Infection with HBV and HCV are worldwide significant problem in public health [19,20,21,22,23,24]. About 5% (300 millions), of world population has chronic infection with HBV, which is major factor for developing of chronic liver cirrhosis and hepatocellular carcinoma [25,26,27,28,29]. The present study showed that the prevalence of viral hepatitis among age group (30-39) years ,this result is greed with the results published by Central Disease Control(CDC)world wide [4]. While the prevalence of HCV among blood donors in Mosul governerat was 0.03 which was very low as compared with other studies abroad 3% [1,30,31,32,33]. The HCV prevalence among the blood donors in Mosul is 0.03%. Compared to the other European countries this level of prevalence is relatively low [34]. According to the WHO, the world prevalence with HCV is 3.1% [35,36]. The highest prevalence is in Africa, 5.3%, whereas the lowest prevalence is in Europe 1.03% [36]. The highest prevalence of HCV between countries in whole the world is in Egypt, 6–28% (mean 22%), [25,37,38,39], while the opposite to this results found in our study as related to the type of hepatitis . The prevalence of anti-HCV in blood donors varies considerably around the world

with a prevalence of 1.2 % in Japan[40], 0.42 % in Germany[41], 0.68 % in France[42],0.87 % in Italy[43], and 0.01-0.55 % in United States and United Kingdom[44,45].With regard to the burden of HCV seroprevalence in the developing countries blood donors, it has been reported to be 2.4% in the Eastern Province of Saudi Arabia [46],12.3% in Nigeria [47],0.9% in Ghana [48],and more than 20% in Egypt[49]. Age group(30–39)years was presented with 56% of cases ,this means that higher number of blood donors which infected with HBVwas at this age. This age group among the personal included in this study were more susceptible to viral infection than other age groups; In this group donors had a higher chance to exposure to HBV because they are in an active period of life .

Conclusions :

- Prevalence of HBV among blood donors in Mosul was more than HCV prevalence at the same period .
- According to sex , males were infected with hepatitis B and C more than females.
- Distribution of hepatitis B and C show high prevalence within the age group (30-39)years more than other ages.
- The prevalence of HCV-positive blood donors was relatively low in blood bank of Mosul compared to other neighboring countries .

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