

**The frequency of Anti-hepatitis B core antibody in Negative Hepatitis B surface Antigen Blood Donors in Thi-Qar province**

\* Alyaa A. Hafedh, \*\* Saad, A. Ateia and \*\*\* Hind M. Musa

\*Dept. of Pathological Analysis, Coll. of Sciences, Thi-Qar Uni.

\*\*Dept. of Microbiology, Coll. of Medicine, Thi-Qar Uni.

\*\*\*Dept. of Biology, Coll. of Education, Thi-Qar Uni.

**Summary**

Viral Hepatitis Type B is an important public health problem throughout the world. Hepatitis B virus still a major causes of chronic hepatitis. Although, the blood banks using HBsAg as a screening test for HBV , the post transfusion infections remain occur . the aim of this study is the assessment of efficacy of anti-HBc detection test in screening for HBV infections among the blood donors who were negative for HBs Ag in Thi-Qar province . A total of 352 blood donors negative for HBsAg divided into 236 (urban) and 116 persons (rural) were involving in the study and anti-HBc antibody was detected by using ELISA technique . The study shown that the frequency of anti-HBc was high among blood donors was 16 ( 4.54%) , with no significant differences between urban 8 (6.89%) and rural 8 (3.34%) groups under (  $p < 0.05$  ) . The frequency of anti-HBc among blood donors was high and there was no relationship between this marker and resides of donors.

**Keywords:** HBV infection, HBV serological markers, Blood banks.

**Introduction**

Viral hepatitis is an important and widely distributed clinical illness infects human at different age . Hepatitis B is a major health problem and a potentially life-threatening liver infection caused by the hepatitis B virus. more than 240 million people have chronic (long-term) liver infections. About 600 000 people die every year due to the acute or chronic consequences of hepatitis B<sup>(1,2,3)</sup>.

HBV is carried in the blood and other body fluids of people who are infected. It is usually spread by contact with infected blood or body fluids in the following ways: injury or injection, from a pregnant mother to her baby and unprotected sexual intercourse<sup>(4,5)</sup> .

In the typical course of acute hepatitis B , HBV DNA which can be detected by PCR followed shortly afterward by HBsAg and HBeAg are the first viral markers detected in the patients serum . HBsAg may be detected as early as 1–2 weeks or as late as 11–12 weeks after exposure, and its persistence is a marker of chronicity and its persist in the serum during the clinical symptoms and are cleared with recovery.

Antibody to HBcAg (anti-HBc) generally appears shortly before onset of clinical illness and considers as a marker of previous infection. For this reason, anti-HBc testing is the most reliable means of assessing previous infection with HBV<sup>(3,4,5)</sup>. If the anti-HBc present only in the serum this means HBV infection in remote past; "low-level" HBV carrier; "window" between disappearance of HBsAg and appearance of anti-HBs; or false-positive or nonspecific reaction<sup>(4,6)</sup>.

Humans are the sole reservoir of HBV. Transmission is parenteral, either with blood or body fluids containing HBV (sexual intercourse) that come into contact with mucosa, lesions, or micro-lesions in the skin. In transmission by blood, the tiniest amounts contaminating syringe needles, ear-piercing needles, tattooing instruments, etc. suffice to produce an infection.<sup>(3)</sup>

Another high-risk group includes all healthcare workers with regular blood contact. All blood samples must be considered potentially infectious and handled only with disposable gloves. Addicts who inject drugs with needles are also obviously exposed to a high level of risk.<sup>(7)</sup>

Unsafe blood transfusion is one of the routes of transmission for HBV infection. In spite of, all blood donors being tested routinely for hepatitis B surface antigen (HBsAg) as a marker for HBV, the cases of post-transfusion hepatitis B virus infection are still common. Generally occult HBV infection is defined as the detection of HBV DNA in the serum or tissue of subjects who have negative test for HBsAg. In addition, antibodies to hepatitis B core (HBc) antigen are marker to acute, chronic and resolved HBV infection that remain detectable forever. Consequently anti HBc is detected in anyone who has been infected with HBV, while the level of HBs-Ag in the circulation becomes too low to be distinguished.<sup>(8,9)</sup>

present study was designing to assess the frequency of anti-hepatitis B core (anti-HBc) positivity in serum samples of healthy blood donors who gave a negative results to HBs Ag in the main blood bank, Thi-Qar/Iraq. We evaluated the efficacy of anti-HBc detection test along with HBs Ag as a screening assay for safety of donated blood.

## **Materials & Methods**

This study was performed in Central Blood Bank, Thi-Qar province, Iraq during the period from September/2013 to February/2014, the study involved 352 blood donors (males with age ranging from 17 to 74 years) that produced a negative results for HBs Ag. the persons were divided into two groups according to reside, urban involved 236 persons and rural which involved 116 persons.

## **Serological tests**

Serological tests for HBsAg and anti-HBc antibody, were performed by using EIA according to manufacture instruction (biokit, Spain) for HBs Ag detection and (InTec. China) for anti-HBc.

## **Statistical analysis**

Statistical analysis was computer aided using SPSS by Chi square.

## Results

As revealed in Table (1) , anti-HBc antibody was detected in 16 persons represents 4.54 % of HBs Ag negative blood donors . the results shown no significant differences between urban ( 8 , 3.38 % ) and rural ( 8 , 6.89 % ) groups in the frequency of anti-HBc among the blood donors in this study under (  $P < 0.05$  ).

Table (1): The frequency of anti-HBc among HBs negative blood donors .

Reside \ Anti-HBc	Positive		Negative		Total	
	No.	%	No.	%	No.	%
Urban	8	3.38	228	96.62	236	67.04
Rural	8	6.89	108	93.11	116	32.96
Total	16	4.54	336	95.45	352	100

## Discussion

The HBsAg can usually be detected in blood after (1-2) weeks following exposure and disappear within (6) months of infection in 90% of people with hepatitis B. In the remaining percent (10%) the HBsAg persists after 6 months which is an indicator for chronic hepatitis B<sup>(3,4)</sup> . In approximately 50% of patients with self-limited hepatitis B virus infection, there is a time interval of up to several months between the disappearance of detectable HBsAg and the appearance of anti-HBs. During this time, only the anti-HBc is detectable; this period is referred to as the “core window” or “window phase”.<sup>(4)</sup> , In the current study, the frequency of anti-HBc positive cases among healthy blood donors that gave a negative results for HBs Ag in Thi-Qar province was 4.54 % .the results was accepted to some studies in Iraq that shown high rate of anti-HBc in the persons under studies<sup>(10,11)</sup> .Even though , the percentage of incidence of this antibody was lower than in these studies may be due to differences in the size of samples , geographical area , economic state and social effects . Also, the prevalence of HBV depending on environmental and host factors such as nutritional state and the defect in immune response to infections . These individuals may have recovered from previous infection but have persistent low level of anti-HBc or in window period<sup>(4,5)</sup> . The study revealed no significant differences between the urban and rural groups ( 3.38 % and 6.89% ) respectively, although the differences in percent between two groups were obvious.

## Conclusion

According to this study, the frequency of anti-HBc was high among blood donors. So, the anti HBc detection test along with HBs Ag detection test increase ability of detection HBV infections. Also, there is no relationship between antibody frequency and residing of persons.

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**تردد الجسم المضاد للمستضد اللبي لفايروس التهاب الكبد النوع ب في المتبرعين بالدم اللذين  
اظهروا نتيجة سالبة للمستضد السطحي ب**

\*م. علياء عبد الحسين حافظ ، \*\*م. د. سعد عبد العزيز عطيه،\*\*\*م. د. هند مزهر موسى

\* قسم التحليلات المرضية/ كلية العلوم/ جامعة ذي قار.

\*\* فرع الاحياء المجهرية/ كلية الطب/ جامعة ذي قار.

\*\*\* قسم علوم الحياة/ كلية التربية/ جامعة ذي قار.

**الخلاصة**

يعد التهاب الكبد الفيروسي النوع ب مشكلة عالمية صحية خطيرة وهو السبب الرئيسي لالتهاب الكبد المزمن. بالرغم من ان مصارف الدم تستعمل اختبار الكشف عن المستضد السطحي لفايروس التهاب الكبد النوع ب في التحري عن الاصابة بالفايروس الا ان اصابات الكبد بعد نقل الدم مستمرة بالحدوث . الهدف من الدراسة هو تقييم كفاءة اختبار الكشف عن الجسم المضاد anti-HBc Ab في التحري عن اصابات التهاب الكبد الفيروسي النوع ب بين المتبرعين بالدم في محافظة ذي قار. كان العدد الكلي للمتبرعين اللذين اظهروا نتيجة سالبة لفحص HBs Ag ( ٣٥٢ ) متبرع قسموا الى مجموعتين حسب محل السكن بواقع ( ٢٣٦ ) من المدينة و ( ١١٦ ) من الريف وقد استخدم فحص الاليزا للكشف عن HBs Ag و anti-HBc AB . اظهرت الدراسة ان تردد anti-HBc AB كان عاليا بين المتبرعين بالدم. اذ ان ١٦ متبرع يمثلون ( ٤,٥٤ %) اظهروا نتيجة موجبة لفحص anti-HBc AB مع عدم وجود فروق معنوية بين مجموعتي المدينة ٨ ( ٦,٨٩ %) و الريف ٨ ( ٣,٣٤ %) وبمستوى احتمالية ( ٠,٠٥ ) . يستنتج من هذه الدراسة ان تردد anti-HBc AB كان عاليا بين المتبرعين اللذين اظهروا نتيجة سالبة لفحص HBs Ag مع عدم وجود علاقة بين تردد الجسم المضاد و محل السكن الخاص بالمتبرع.

**الكلمات المفتاحية:** التهاب الكبد الفيروسي النوع ب، الفحوصات المصلية لالتهاب الكبد الفيروسي النوع ب، مصارف الدم.