The role of detection of anti-HBc IgM in HBsAg negative blood donors

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ABSTRACT

Background: Post Transfusion hepatitis B viral infection is a major problem even after adoption of mandatory screening test, HBsAg by ELISA test in blood banks. In Egypt, HBsAg is the only HBV screening test of blood donors in most bloods banks. However HBsAg negative blood donors does not rule out the risk of transmission of hepatitis B, as the donor may be in the ‘window period’ or has a mutant strain. During this period, detection of the antibody to the hepatitis B core antigen (anti-HBc) IgM type is a useful serological marker.

Objective: this study aimed to evaluate the significance of screening anti-HBc IgM for HBsAg negative blood donors to reduce the risk of transfusion transmitted HBV infection in Egypt.

Methodology: Four hundred HBsAg negative blood donors were randomly selected from Al-Zahraa University hospital blood bank, for further screening by anti-HBcIgM by ELISA test, then positive samples for anti-HBcIgM were tested for HBV DNA by PCR.

Results: Nine (2.25%) out of selected 400 samples were positive for anti-HBcIgM, and 4 (1%) out of these 9 samples

Conclusion: Anti HBcAg IgM screening test should be implemented as an additional screening test for blood donors in Egypt, to improve transfusion safety as it is an indicator of occult HBV during window period.

Keywords: HbsAg, anti HBc IgM, HBV DNA, window period.

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INTRODUCTION

Hepatitis B is a life-threatening liver infection caused by the hepatitis B virus (HBV). It is one of the major global health problems especially in highly endemic areas [1]. It occurs worldwide, up to two billion, approximately 30% of the world's populations, have serological evidence of past or present HBV infection [2]. Despite the availability of a highly efficient vaccine and potent antiviral agents, the burden of the disease is increasing as almost 45% of the global population live in developing regions with high prevalence (>8%) of chronic HBV infection, where vaccination of large populations has not been possible due to economic reasons [3] HBV infection can induce a wide spectrum of clinical features, ranging from an inactive carrier state, acute to fulminate hepatitis, or chronic infection to cirrhosis or hepatocellular carcinoma (HCC) [2].

Chronically infected people represent about 257 million and about 5 % of these are at risk of developing the squeal of chronic HBV infection [4] HBV infection is one of the major risk factors for the development of HCC in the world. Most of the burden of the disease (85%) is observed in highly endemic regions. HCC is the sixth most common cancer in the world and the second leading cause of cancer death [5] Death resulting from HBV, stands for about 1-34 million deaths annually. Most of these due to liver cirrhosis, liver failure and HCC [6] As blood transfusion is an important route of HBV transmission; it is recommended that all donated blood should be screened for HBV before transfusion to prevent post-transfusion hepatitis. Screening of donated blood is by hepatitis B surface antigen (HBsAg), which was introduced in the 1970s and this greatly reduced post- transfusion hepatitis [7] However, negative HBsAg of apparently healthy donor’s dose not exclude HBV
infection and HBV is still the highest risk among transfusion-transmitted diseases. There are various clinical conditions at which HBsAg is negative, although there is HBV infection. These conditions include the window period, low viral level after recovery and escape mutants. The presence of HBV-DNA in blood or liver tissues in patients negative for HBsAg with or without HBV antibodies is known as occult HBV infection (OB1). It represents a carrier state of the disease and a definite hazard of transmission of HBV to recipients. Finding a marker that can detect HBV infection in HBsAg negative cases is very important to be implemented in blood banks to diagnose these cases. It was found that antibody to the hepatitis B core antigen is more effective for diagnosing HBV in these cases. Hepatitis B core antigen consists of two classes, IgM and IgG. IgM (anti-HBcIgM) is the first antibody to appear and indicates a recent infection, while the IgG class appears later during the infection and indicates past HBV infection or recovery. Individuals with anti-HBc IgG may not be infectious as they may have high titers of antibodies to HBsAg, which are protective in nature. So the IgM class of the anti-HBc is more effective marker for HBV infection in HBsAg -ve cases. PCR technique is important in diagnosis of these conditions, however if HBV DNA testing is not feasible, detection of anti-HBc, mainly IgM class, is a useful serological marker for HBV infection in these cases.

**SUBJECT AND METHODS**

I. Study population

The present study was carried out on four hundred voluntary blood donors, 352 males (88%) and 48 were females (12%) with average age from 20 to 50 years old. Samples are collected from the blood bank of Al-Zahra University Hospital from November 2017 to May 2018. The study was held in the microbiology department of Faculty of Medicine (for girls), Al-Azhar University (Cairo, Egypt) and immunity section of clinical pathology department of Al Zahra University Hospital. Verbal informed consent was obtained from all donors. The approval from the Research Ethics Committee of the faculty of medicine, Al-Azhar University was also obtained.

The following was done of all subjects in the study:

1. The blood donors were selected after they fulfilled the mandatory criteria for donation eligibility as guidance for blood banks (age, sex, and nationality) are recorded.
2. All samples were negative for all screening tests that done in blood banks (HBV, HCV, HIV and malaria).

Inclusion criteria:

Age above 18 years old, both sexes and their blood thought to be safe for transfusion after screening (negative for HbsAg, negative HCV antibodies, negative HIV and malaria).

Exclusion criteria

Age below 18 years old, positive blood samples for HBV, HCV, HIV or malaria.

II. Samples:

1. At the time of blood donation, 5 ml of venous blood was drawn aseptically by venipuncture and collected in a clean sterile glass tube for screening for transfusion-transmitted diseases (HBV, HCV, HIV and malaria).
2. Samples were clearly identified with codes or names in order to avoid misinterpretation of results.
3. All the blood samples were subjected to the mandatory screening tests for detection of transfusion transmitted diseases (HBV, HCV, HIV and malaria) by the ELISA tests for anti-HIV 1 and anti-HCV, HBsAg and malaria.
4. Then negative plasma samples are divided to 3 aliquots and stored at –20°C for our study.
5. Screening for anti-HBcAg IgM by ELISA test for all 400 collected samples.
6. Then positive samples for anti-HBcAg IgM are confirmed by PCR for HBV DNA detection.

III. Methods of study:

1. **ELISA test for detection of anti HBc IgM:** Detection of anti HBV core IgM quantitatively was performed by using the anti-HBc IgM kit manufactured by DIA.PRO Diagnostic Bioprobes Srl Via Columella n° 31, 20128 Milano - Italy.

2. **Detection of HBV DNA by PCR technique for positive anti HBc IgM ELISA test:**

DNA extraction protocol:

This protocol is for purification of viral nucleic acids from 200 µl of plasma using the QIAamp MinElute Virus Spin Kit and a microcentrifuge (QIAGEN®, QIAamp®, QIAcube®, BioRobot®, EZ1TM MinElute® (QIAGEN Group); Corex® (Corning, Inc.); Eppendorf® (Eppendorf- Netheler-Hinz GmbH). It was done by using universal primer pairs P1 (sense) ...5'-TCA CCA TAT TCT TGG GAA CAA GA-3' (2823–2845 nt) 1063bp, and S1-2(antisense)......5'CGA ACC ACT GAA CAA ATG GC-3' (704-685 nt). The reaction mixture contains 5 ul of extracted DNA, 25 ul of master mix, 5 Pmol of each primer completed to 50ul with distilled water. The thermal cycler was programmed at 95°C for 10 minutes, followed by 40 cycles at 92°C for 20 sec (denaturation), 56°C for 20 sec (annealing), and 72°C for 1 min (extension) then at 72°C for 10 minutes. HBV genomic DNA and a negative sample were used as positive and negative controls, respectively from our microbiology lab. For the analysis of the PCR amplification, 10 µL of the amplified DNA were run on 3% agarose gel after addition of 4 µL of loading buffer. The presence of a1063-bp fragment indicated a positive result. In parallel with samples, a 100-bp DNA ladder
was also run on the gels to estimate the molecular weight of DNA fragments in the gel.

**Statistical Analysis**

Data were collected, revised, coded and entered to the Statistical Package for Social Science (IBM SPSS) version 22. Qualitative variables were presented as number and percentages. The comparison between groups with qualitative data was done by using Chi-square test. The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the p-value was considered significant as the following: $P > 0.05$ was considered non-significant and $P < 0.05$ was considered Significant.

**RESULTS**

This study was conducted on 400 donated plasma samples of healthy blood donors and they were negative for all blood screening tests in blood bank (HBV, HCV, HIV and malaria). All donors showed normal blood pressure, normal liver function tests, and no history of jaundice or any liver disease which were done by blood bank. Baseline characteristics of the studied groups presented in tables (1 and 2).

The demographic data revealed that the patient ages ranged from 20-50 years. Three hundred and fifty two 352 (88%) were males and 48 (12%) were females, with male to female ratio was 7.3:1 respectively. Concerning age range and ratio between male and female according to this range, Donors of ages between 30-40 years constituted the largest proportion 172 (43%). 144 (37.25%) were males and 23 (5.25%) were females. While age ranged from 20-30 was 123 (30.75%), 114 (28.5%) were males and 9 (2.5%) were females and age from 40-50 were 105 (26.25%), 89 (22.25%) were males and 16 (4%) were females. The majority of blood donors 312(78%) were from urban area, while the remaining 88(12%) were from rural area.

From a total selected 400 plasma samples of blood donors negative for HBsAg, 9/400 (2.25%) were reactive for anti-HBc IgM, 7 (1.75) males versus 2(5%) females as shown in table (3). Concerning comparison between HBc IgM positive and negative samples from our selected group, 9/400 was positive, and 391/400 were negative. Seven males were positive and 344 were negative, while 2 female were positive and 46 were negative as shown in table (4).

These 9 reactive samples for anti HBc IgM, 6 of them show concentration more than 10 u/ml which indicate positive reaction while 3 was in the gray zone with a conc. between 5-10u/ml. PCR test for HBV(fig.1) was done for 9 anti HBcIgM positive samples for 9 samples were selected randomly from negative anti HBcIgM samples with the same age and sex of positive samples as control group. It was observed that four out of the 9 positive for anti-HBcIgM were positive for HBV DNA by PCR, representing a percentage of 1% while those in the grey zone was negative (table 5).

<table>
<thead>
<tr>
<th>Age groups</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-30</td>
<td>123</td>
<td>114</td>
<td>9</td>
</tr>
<tr>
<td>30-40</td>
<td>172</td>
<td>149</td>
<td>23</td>
</tr>
<tr>
<td>40-50</td>
<td>105</td>
<td>89</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>352</td>
<td>48</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Residence</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>312</td>
<td>78%</td>
</tr>
<tr>
<td>Rural</td>
<td>88</td>
<td>22%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IgM</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>2.25%</td>
</tr>
<tr>
<td>Male</td>
<td>1.75%</td>
</tr>
<tr>
<td>Female</td>
<td>0.5%</td>
</tr>
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</table>
Table (4): Comparison between anti HBc IgM positive and anti HBc IgM negative blood donors by sex distribution

<table>
<thead>
<tr>
<th></th>
<th>Anti HBc IgM Positive IgM (no.=9)</th>
<th>Anti HBc IgM Negative IgM (no.=391)</th>
<th>Chi square test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Male</td>
<td>7/9</td>
<td>77.8%</td>
<td>345/391</td>
</tr>
<tr>
<td>Female</td>
<td>2/9</td>
<td>22.2%</td>
<td>46/391</td>
</tr>
</tbody>
</table>

Table (5): Results of HBV-DNA by PCR in relation to results of anti-HBC IgM

<table>
<thead>
<tr>
<th>ELIZA positive samples</th>
<th>HBV-DNA by PCR</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>High concentration (More than 10 u/ml)</td>
<td>4/6 (66.7%)</td>
<td>2/6 (33.3%)</td>
</tr>
<tr>
<td>Gray zone (5-10u/ml)</td>
<td>0.0</td>
<td>3/3 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>4/9 (44.4%)</td>
<td>5/9 (55.6%)</td>
</tr>
</tbody>
</table>

DISCUSSION

In blood banks of many countries, HBsAg test is the only screening test to indicate HBV infection in donated blood. However, it does not rule out the risk of HBV transmission totally, because during the host serological response there is a phase during which the HBsAg cannot be detected although HBV infection is present. This phase is called the ‘window period’ which represents a carrier state of the disease. In addition, HBsAg is not detected in case of mutant strain therefore, transfusion of blood collected from donors in these conditions may lead to post transfusion HBV infection in the recipient [13].

As post transfusion HBV infection is a major problem especially in developing countries, finding a marker which would be indicative of HBV infection in HBs Ag negative cases is very important in blood banks. It is shown that HBc Ab and nucleic acid tests are more effective in these cases. Since nucleic acid tests are expensive, anti-HBc antibodies has been found to be more suitable indicator in these conditions [14].

The IgM class of the anti-HBc is the first to appear even late in incubation period and indicates a recent infection. So anti-HBc IgM is an excellent marker for HBV infection in HBsAg negative blood donors. While the IgG class of anti-HBc appears later and indicates a past infection. Individuals with anti-HBcIgG may not be infectious and their blood is suitable for transfusion as they may have sufficiently high titres of anti-HBs which are protective in nature [10].

The prevalence of total anti-HBc in blood donors is proportional to the incidence of HBsAg in the general
population. It is low in the Western countries as these countries have low incidence of HBsAg so, screening of donated blood in these countries by total anti-HBc is practical and they can discard such positive blood units without wastage [15].

Several studies reported that detection of total anti-HBc had contributed significantly in reduction of the incidence of post transfusion HBV infection amongst donors [16]. On the other hand, blood banks in medium or high- endemic areas cannot depend on total anti HBC as a screening test for donated blood, as these countries have high prevalence of total anti-HBc. The reactive blood units for total anti HBC in these areas may not be infectious and these blood units are suitable for transfusion. Anti-HBc IgM seems to be more practical in these countries to see the infectivity status of HBs Ag negative blood donors [17].

In our study we aimed to evaluate the role of anti-HBc IgM in blood donors negative for HBsAg in order to increase safety of donated blood. In this study, 400 blood donors negative for all routine screening tests in blood banks (HBsAg, HCV antibodies, HIVAbs and Treponema Abs), 352 (88%) were males and 48 (12%) were females with age ranges from 20-50 years. Quantitative analysis of anti-HBc IgM was done by “capture” enzyme immunooassay using DIAPRO Diagnostic Bioprobes kits. Positive samples for anti-HBc IgM were further tested for HBV-DNA by PCR.

This study revealed the following results, 9/400 (2.25%) were reactive for anti-HBc IgM, 7 (1.75) males versus 2 (.5%) females. The quantitative analysis for HBc IgM revealed that 6 donors had antibody levels greater than 10.00 Paul Ehrlich International units per mL (PEI U/mL); these were considered positive. However, 3 donors in the grey area within the 5- to 10-PEI U/mL were considered border line. All these 9 HBc IgM reactive samples were tested for DNA by PCR, 4/9 (1%) were positive. The other 2 + ve samples and all 3 samples which were in gray zone were negative for PCR.

There was a close data to our study reported by a previous study in South Egypt Cancer Institute conducted on 180 HbsAg negative blood specimens, were selected randomly for further testing for (anti HBC IgM, anti HBs antibody and HBV DNA testing). 7/180 (3.8%) were positive for anti-HBC IgM. While positive donors for anti-HBs antibody were 34/180 (18.8%). Two specimens (1.1%) out of 7 anti-HBcIgM positive samples were positive for HBV DNA by PCR [18].

Another study that conducted on 760 Egyptian blood donors were routinely screened for (HBsAg, HCV-Ab, HIV and Syphilis), accepted blood units (712) for donation were further tested for the presence of anti-HBc-IgM and HBV-DNA. These results were (0.13%) HBc-IgM positive unit and 2/30 HBV DNA positive unit. Antibody should be tested routinely on all donated blood units as well as sensitive methods for detection of HBV (e.g. PCR) may be recommended in screening donated blood [19].

There were two cross-sectional studies in Nigeria supporting the fact that screening blood donors for HBsAg does not rule out the risk of post transfusion HBV infection. The first one was in 2011, 92 blood donors were enrolled for this study screened for 5 different markers of HBV (HBsAg, anti-HBsAg, HeAg, anti-HBeAg and anti-HbcIgM). HBsAg was detected in 18 (19.6%), anti-HBs in 14 (15.2%), HBeAg and anti-HBe were detected in 4 (8.9%) and 12 (26.7%) respectively from 45 donors sampled. Anti-HBc IgM was found in 12 (13.0%) cases, 7 of them sharing with other markers, while 5 (5.4%) of the 92 donors had anti-HBC IgM as the only serological evidence of HBV infection, which represents high numbers from all infected cases [11]. The other study was conducted on 200 HBsAg- negative blood donors, then tested for HBV markers (HBeAg, anti-HBeAg, anti-HBs, total anti-HBc and anti-HBc IgM). only 5 (2.5%) were positive for anti-HBs. Sixty-five participants (32.5%) were positive for total anti-HBc, indicating a past exposure to HBV. Overall, 8 (4.0%) of the donors were found to be positive for anti-HBC IgM alone. Five (2.5%) out of the 200 HBsAg-negative blood donors were positive for anti-HBs (2.5%) [20].

Another study by Lavanya of a total 200 blood donors were screened for the presence of HBsAg. Total anti-Hbc, anti-HBc IgM and anti-HBs were done for HBsAg negative cases. The prevalence of HBsAg was 3.5% (7 cases) and HBsAg negative cases were 193, total anti-Hbc 10.9% (22 cases), anti-HBc IgM 5.7% (11 cases) and anti-HBs 3% (6 cases). All the 6 anti-HBs positive donors were also found to be positive for total anti HBc indicating past infection, but the result of anti-HBc IgM indicates recent infection [21]. An Indian study support the above results, 12232 healthy blood donors negative for HBsAg were screened for anti-HBc IgM, this study revealed a percentage of (0.12%) reactive for anti-HBc (IgM). This low percentage in comparison to other studies due to high number included in this study [22].

According to study in India, a total of 2552 voluntary blood donors were studied for (HBsAg and anti-HBcIgM) of which 47 (1.84%) cases were HBsAg positive and 11 blood units were anti-HBcAg IgM.
positive, only one of these positive IgM was HBsAg positive and 10 were negative, giving a positivity rate of 0.39% amongst the 10 HBsAg negative and anti-HBcAg IgM reactive blood donors [23]. El-Zayadi and his coworkers study was conducted on 760 Egyptian healthy blood donors were screened according to routine practice for the presence of (HBsAg, HCV antibodies, HIVAbs and Treponema Abs). They reported that 48/760 units (6.3%) were rejected. The accepted blood units for donation were tested for the presence of total anti-HBc Abs. Positive units for total anti-HBc were further tested for HBV-DNA by PCR. Among the accepted blood units (712) for total anti-HBc were further tested for HBV-DNA by PCR. Among the accepted blood units (712) for donation, prevalence of total anti-HBc was 78/712 units (10.96%). HBV-DNA was detected in 9/78 (11.54%) of the total anti-HBc-positive units and thus, occult HBV infection was detected in 9/712 (1.26%) of the accepted blood donations [24].

Another cross sectional study reported lower data, a total of 1026 HBsAg-negative Egyptian healthy blood donors were tested for the presence of total anti-HBc . Anti-HBc-positive samples were subjected to PCR to confirm the presence of HBV DNA. They reported that 80/1026 (7.8%) blood samples were found reactive to total anti-HBc and HBV DNA was detected in five (4%) of these samples [25]. Another study in El Fayoum conducted on 800 voluntary blood donors, negative for HBsAg, HCVAb and HIV Ab. They were further screened for total anti Hbc antibodies, then anti-HBc-positive samples were tested for anti-HBs and HBV DNA for total anti HBc only. Their result was 99/800 (12.37%) anti-HBc-positive including 78 anti-HBs positive. The remaining 21 donors were anti-HBc alone, 2 of which (9.52%) were HBV DNA-positive [26].

**CONCLUSIONS**

To reach a completely safe blood transfusion; It is recommended that anti HBc mainly IgM class need to be implemented in Egypt as primary test in blood banks for detection of HBs Ag negative blood donors. Also, HBV DNA need to a confirmatory test for anti HBc IgM positive cases and if they were positive regardless of anti-HBs titer, the blood should be discarded.

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**Conflicts of interest**

The authors declare that there is no conflict of interest regarding the publication of this paper.

**REFERENCES**


2. Teo EK, Lok AS. Epidemiology, transmission, and prevention of hepatitis B virus infection. UpToDate: June. 2006.


10. Al-Ezzi IH, Salman AD. Study of Some Serological Markers (Hbs Ag, Anti-Hbs and Ant-Hbc IgM) for Detection of Occult Hepatitis B Virus Infection Among Blood Donors in Diyala Province. Age.;200:100-0.

11. Japhet MO, Adesina OA, Donbraye E, Adewumi MO. Hepatitis B core IgM antibody (anti-HBcIgM) among hepatitis B surface antigen (HBsAg) negative blood donors in Nigeria. Virology journal. 2011 Dec;8(1):513


20. Available at https://www.researchgate.net/publication/235249325


الملخص العربي
دور الكشف عن الجلوبولين المناعي M لمستضد فيروس B اللبلي لمتبرعي الدم سالبي المستضد السطحي لفيروس B

العنوان: إبراهيم، سن.1، صفيحة عبد الحليم، أمل السيد، عهد.2

الاسم، فيروس B اللبلي، إبراهيم، سن.1، صفيحة عبد الحليم، أمل السيد، عهد.2

الجهة: كلية الطب، جامعة الأزهر، جمهورية مصر العربية

الملخص البحث:
الخليفيه: إن العدوي فيروس B بسبب الدم يمكن من خلال عن طريق الفحوصات المتزامنة في كل بنوك الدم لكل متربي الدم للكشف عن المستضد السطحي لفيروس B بطريقة الألزامي وكم تلك المشكلة في الحمض على نتائج سلبية لهذا المستضد لبعض المتبرعين بالرغب من اصابتهم بفirus B حيث يعتبر هذا المتبرع حاملا للمرض ومن ثم فإن هذا التحليط غير كاف للتأكد من عدم مصابية الدم فيروس B وسمي الحالة التي تظهر فيها نتيجة خلال مستضد فيروس B السطحي عملية مع وجود المادة الوراثية لفيروس B بالالتهاب الكبدي ب المتضرف حيث قد يكون المتبرع في "المرحلة النافذة" أو يعاني من سلالة محولة وخلاصة هذه الفترة، يعد الكشف عن الجلوبولين المناعي M مستضد فيروس B اللبلي للكشف عن الإصابة بفيروس B لمتبرعي الدم سالبي المستضد السطحي لفيروس B علامة مصطلحية مفيدة.

المستند المكتشف للكشف عن الفيروس B في مصري سالبي فيروس B لمتبرعي الدم سالبي المستضد السطحي لفيروس B وذلك لزيادة سلامة أهل الدم.

الطرق: شملت الدراسة 200 عينة لمتبرعي الدم والتي أظهرت جميع حالاتهم التي تجري بشكل رؤتيني في بنوك الدم للكشف عن الأمر، التي تنقل بالمختبر فيروس B فيروسات مرضية المناعة المكافحة والملاريا نتيجة سلبية. بعد ذلك قمنا بناءة حليل الكشف عن الجلوبولين المناعي M مستضد فيروس B اللبلي لكل عينة عن طريق فاعل الألزامي. ثم أجرينا حليل فاعل اللمبرة المستند للكشف عن الحمض النووي لفيروس B للعينات الموجبة لتحليل الجلوبولين المناعي M مستضد فيروس B اللبلي.

النتائج: أثبتت هذه الدراسة وجود بعض الحالات المصابة فيروس B من بين متبرعي الدم والتي أظهرت نتيجة الكشف عن فيروس B عن طريق المستضد السطحي لفيروس B نتيجة سلبية مسبقة. فقّم الحصو على نتيجة 9 عينات موجبة للمجتمع المناعي M في ملعدي فيروس B اللبلي من بين العينات الأربعة المتماثلة في البحث بنسبة 20.5%، وبعد إجراء حليل فاعل اللمبرة المستند للكشف عن الحمض النووي لفيروس B تم التأكد من وجود 4 عينات إيجابية لوجود الحمض النووي لفيروس B.

الاستنتاجات: لذا فإن من التوصيات الناتجة عن هذا البحث هو ادراج حليل الكشف عن الجلوبولين المناعي M لمستضد فيروس B في مختبر الدم المصري للكشف عن أي الحالات التي لا يمكن تشخيصها عن طريق المستضد السطحي لفيروس B ثم التأكد عن طريق حليل فاعل اللمبرة المستند للكشف عن الحمض النووي لفيروس B للعينات الموجبة لهذا التحليل.

الكلمات المفتاحية: الجلوبولين المناعي M، المستضد السطحي لفيروس B، الحمض النووي لفيروس B، الكبد، الفترة النافذة.

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