

Hepatitis B Surface Antigen Prevalence among Screened Populations and Certain Risk Groups in AL-Anbar Governorate, West of Iraq

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Abstract

Background:- Hepatitis B virus (HBV) infection is a worldwide problem, two billion people have been infected with hepatitis B virus (HBV), 360 million have chronic infection and 600,000 die each year from HBV related liver disease or hepatocellular carcinoma (HCC).

Aim of the study: This study aims to determine the prevalence of the HB virus in AL-Anbar Governorate among screened groups.

Patients and methods:- This is a retrospective study conducted and achieved in Al-Anbar Central Laboratory during the period from January to December 2012. Questionnaire sheet include age, sex and residency were recorded. The sera from study group individuals were submitted for screening by preliminary screening test, dipstick immunoassay which depends on immune-chromatography for detection of hepatitis B virus. After that all hepatitis B positive sera were examined for the presence of Hepatitis B surface antigen (HBsAg) by enzyme linked immunosorbent assay (ELISA). 1-Blood donors 2-Routine screened populations which include [before marriage, vaccination, endoscopic and dental procedure]. And 3- Among certain risk groups which include pregnant women, midwife, health worker and contacts [persons who in contact with positive HBsAg].

Results:- The prevalence of HBsAg among blood donor was 1.25% and among certain risk groups include pregnant women was 0.46%, health worker was 0.28%, non-urgent operation was 0.63%, midwife 0.64%, contacts were 0.97%. While the prevalence among routine screened populations were 12.39%.

Conclusion: - The prevalence of hepatitis B surface Ag is high among routine screened population and low among certain high risk groups. Although there is discrepancy between these two groups HBV screening is highly recommended.

Key words: - HBsAg, HBV, statistical parameters, ELISA

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Introduction

Hepatitis B virus (HBV) infection is a worldwide problem, two billion people have been infected with hepatitis B virus (HBV), 360 million have chronic infection and 600,000 die each year from HBV-related liver disease or hepatocellular carcinoma (HCC) ¹.

The risk of infection with transfusion-transmitted viruses has been reduced remarkably since the introduction of serological screening. However, a zero-risk blood supply remains a goal. The risk of transfusion-transmitted HBV infection has been reduced by screening all blood donations for HBsAg since 1970², it was

generally accepted that the disappearance of HBsAg indicates the clearance of HBV. Meanwhile many reports pointed to occurrence of post-transfusion hepatitis B³. HBV is ubiquitous in body fluids, including blood, saliva, sweat, breast milk, tears, urine, vaginal secretions, semen, and menstrual blood⁴.

Because HBV is resistant to breakdown outside of body, it is easily transmitted through contact with infected body fluids.⁵ The world can be divided into three areas where the prevalence of chronic HBV infection is: high (>8%), intermediate (2-8%), and low (<2%)⁶. HBV is ubiquitous in body fluids, including blood, saliva, sweat, breast milk, tears, urine, vaginal secretions, semen, and menstrual blood⁷. Because HBV is resistant to breakdown outside of body, it is easily transmitted through contact with infected body fluids⁸. Person to person spread of HBV between household Contacts can occur, as HBV can survive in the environment for 7 days or more⁹. Blood product screening has virtually eliminated this source of HBV transmission; however, in underdeveloped countries, re-use of medical instruments, contaminations of multiple dose medicine vials, and re-use of disposable needles remains as risks for infection¹⁰.

This study aims to determine the prevalence of the HB virus in AL-Anbar Governorate among screened of different groups of population.

Patients and Methods:

This is a retrospective record based study conducted in Al-Anbar central Laboratory from January to December 2012. Requestionary sheet include age, sex and residency were recorded.

Study groups:-

The study group populations submitted to study techniques include:-1 blood donor.2- Routine screened include [before marriage, vaccination, endoscopical and dental procedure]. 3- Among certain risk include [health workers, contact persons, mid-wife and pregnant women].

Study techniques:-Dipstick immunoassay and Enzyme linked immunosorbent assay: -

The sera from study group individuals were submitted for screening by preliminary screening test, dipstick immunoassay which depend on immuno-chromatography for detection of hepatitis B virus. After that all hepatitis B positive sera were examined for the presence of Hepatitis B surface antigen (HBsAg) by enzyme linked immunosorbent assay (ELISA).

Statistical analysis:-

Date was manually analyzed or by SPSS version 18, frequency distribution tables were arranged, X2Chi-Square Test and Paired Samples T test, significance applied test P value less than 0.05 was considered significant.

Results:

The prevalence of HBs Ag among screened total blood donors 16125 was 1.25%.

[fig 1] The prevalence among certain risk groups which include pregnant women was 0.46%, non-urgent operation was 0.63%, Health worker was 0.28% , midwife was 0.64%, and contacts were 0.97% [table1]. And among routine screened populations were 12.39% considering no significant difference between sex and age groups according to Chi-Square at which p value was 0.127 and X2 equal to 5.88. [Table 2 and figure 2].

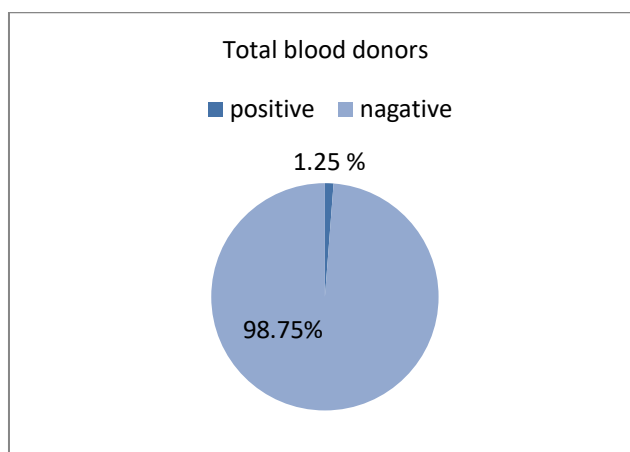


Fig 1-Prevalence of HBsAg among blood donors

Table 1. Prevalence of HBs Ag positive among certain high risk groups

Risk groups	Total screened	positive	prevalence
Health worker	359	1	0.28%
Contacts	3811	37	0.97%
Midwife	157	1	0.64%
non urgent operation	10630	72	0.63%
Pregnant women	3904	16	0.46%
TOTAL	37722	127	

Table2.Prevalence of HBsAg among routine screened populations [before vaccination, marriage, dental and endoscopical procedure] according to age groups and sex .considering no significant difference between these variables ($X^2=5.45$; P value = 1.136).

age group	tested for hbv		total	positive		total positive	prevalence		
	male	female		male	female		male	female	study population
<5years	100	109	209	1	4	5	1.00%	4%	2.39%
5-14	241	287	528	35	28	63	14.52%	10%	11.93%
15-44	470	575	1045	72	90	162	15.32%	16%	15.50%
≥ 45	208	222	430	25	18	43	12.02%	8%	10.00%
total	1019	1183	2202	133	140	273	13.05%	12%	12.39%

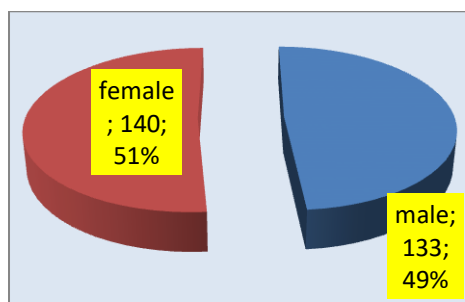


Figure 2. Distribution of patients with HBsAg according to sex in considering no significant difference between these variables ($\chi^2=0.18$; P value=0.67).

Discussion:

The present study revealed that hepatitis B prevalence among total screened blood donors 16125 was 1.25%. This finding is consistent with results of National Blood Bank the statics showed that the carrier rate of HBV was 1.3-2.5% over the years 1989-1999, but the majority of the involved were healthy 18-50 years old male donors¹¹. This prevalence was lower than that reported by a study in Palestine as 9.2%¹². In Turkey, the prevalence of HBsAg among blood donors was 4.19% between 1989 and 2004¹³. In Diyala the prevalence of HBV infection in blood donors was 1.5%¹⁴. It is noteworthy that in areas with low HBV prevalence, not more than 5% of HBsAg (-)/anti-HBcAb (+) blood units contains HBV-DNA. In contrast, in high prevalence areas (such as India and Taiwan), serum HBV-DNA is found in 4%-25% of the HBsAg (-) and anti-HBc (+) population¹⁵. The studies of prevalence in North America revealed that HBV DNA was detected in 0.1%-1.05% of those who were HBsAg negative and anti-HBc-positive (with or without anti-HBs) and that HBV DNA was detected in 2.03%-2.8% in the anti-HBc only category (no anti-HBs)^{16, 17}. The studies of prevalence in Europe reveal that HBV DNA was detected in 0%-1.59% of those who were HBsAg negative and anti-HBc-positive (with or without anti-HBs) and

HBV DNA was not detected in patients who were anti-HBc only studies of prevalence in the Middle East and Asia revealed that HBV DNA was detected in 1.09%-3% of those who were HBsAg negative and anti-HBc positive (with or without anti-HBs) and that HBV DNA was detected in 8.1% in the anti-HBc only category (no anti-HBs)¹⁶.

In a study from Kuwait on 26,874 first-time blood donors in 2002, it had been found that 13.7% was positive for the presence of anti-HBs, indicating that 13.7 percent of the total non- Kuwaiti Arab donors population might have had a previous infection and possible immunity to hepatitis B virus (HBV). Infected refugees, gypsies and workers travelling abroad are an important source of hepatitis B for other communities; meanwhile they participate in activities that put them at risk of exposure to hepatitis B. Although immunization against hepatitis B started in the mentioned countries, current prevalence of infection is still significant¹⁸.

The current study revealed that HBV prevalence was 0.28% for health workers, this finding is inconsistent with results of studies in Iran (2007)¹⁹. and Diyala¹⁴. This inconsistency might be attributed to good precautions and health education effort to prevent HBV among risky groups.

The prevalence of HBV was 0.97% among contacts, which was lower than those reported in Pakistan 14.7% in (2008)²⁰. The prevalence of HBV was 0.64% among midwives. This finding is consistent with results of Diyala study¹⁴. Prevalence of HBV was 0.63% among populations underwent non urgent surgical operation. In Pakistan, a total of 913 patients were admitted in Surgical Department for elective operations and were screened for HBsAg. It had been found that (3.61%) were HBsAg positive patients²¹. This might be attributed to high precautions and health education effort to prevent HBV transmission among these high risk groups.

The prevalence of HBV was 0.46% among pregnant women, this was much lower than that reported in Oman which was 7.1%, 1% in Qatar and 1.5% in the United Arab Emirates (UAE) in 2000²². According to that study, HBV exposure may take place at younger age by living in an endemic area and outside the city.

The present study revealed that the incidence of hepatitis B in Al-Anbar province among routine screened populations was 12.39%. According to WHO supported study in 2006, the prevalence of hepatitis B was 1.6 %²² which was lower than that reported in our study. This inconsistency might be attributed to low precautions and health education effort to prevent HBV transmission among general population. A higher proportion of populations with HBsAg were males more than females. This finding is consistent with results of Baghdad study (2006-2009)²³. This is can be explained in the light of social background which males are more involved in daily activities. The lowest incidence rate of hepatitis B was recorded by CDC in USA, they reported that acute hepatitis B incidence declined 81% during

(1995-2006) to the lowest rate ever recorded (1.6 cases per 100,000 population)²⁴.

Limitations of the study

The limitations of this study were 1) Type of this study is observational descriptive study (cross sectional), and the causal relationship cannot be estimated. 2) Recall bias as data collected were dependent on memory of the patients. 3) Lack of anti-HBc test. 4) Results of this study cannot be generalized on Iraqi population. 5) Lack of some information taken from donors regarding exposure to risk factors associated with the transmission of virus

References:

- 1-Colin W.S, Edgar P. S, Lyn F, Anthony E. F , Beth P. B. Hepatitis B Virus Infection: Epidemiology and Vaccination. Epidemiologic Reviews. 2006; 28(1): 112-125.
- 2-Allain J.P. Occult hepatitis B virus infection: implication in transfusion. VoxSanguinis. 2004; 86(2):83-91.
- 3-El-Zayadi R, Ibrahim I.H, Badran H.M, Saeid A, Moneib N.A, Shemis M.A, R. M. Abdel-Sattar R.M, Ahmady A.M & El-Nakeeb A . Anti-HBc screening in Egyptian blood donors reduces the risk of hepatitis B virus transmission. Transfusion Medicine. 2008; 18(1): 55-61.
- 4-Padmanabhan R., 1994- Hepatitis C virus infection in haemodialysis patients in Saudi Arabia. Saudi J Kidney Dis Transp, 5(2):157-158.
- 5-Martin P., Frriedom L., 1995- Chronic viral hepatitis and the management of chronic renal failure. Kidney Int, 47(5):1231-1241.
- 6-. Mahoney FJ, Kane M. Hepatitis B vaccine. In: Plotkin SA and Orenstein WA, eds. *Vaccines*, 3rd ed. Philadelphia, W.B. Saunders Company, 1999:158-182.
7. Boag F. Hepatitis B: heterosexual transmission and vaccination strategies. Int J STD AIDS 1991;2(5):318-24.
8. Perrillo R. Hepatitis B virus replication x time equals trouble. Gastroenterology 2006;130(3): 989-99.
9. Bond WW, Favero MS, Petersen NJ, et al. Survival of hepatitis B virus after drying and storage for one week. Lancet 1981;1(8219):550-1.

10. Kent GP, Brondum J, Keenlyside RA, et al. A large outbreak of acupuncture associated hepatitis B. *Am J Epidemiol* 1988;127(3):591-8
- 11-National blood bank of Iraq statistics on HBsAg carriers, 1989-1999.
- 12-Shiha AM. Prevalence of Hepatitis B Virus DNA among Blood Donors in Nablus- West Bank. A theses submitted to Faculty of Graduate studies/An-Najah University-Palestine, 2011.
- 13-Gurol E, Saban C, Oral O, Cigdem A, Armagan A. Trends in hepatitis B and hepatitis C virus among blood donors over 16 years in Turkey. *EurJ Epidemiol*. 2006; 21: 299- 305
- 14-Abdul-Razak Shafiq et.al. Seroepidemiological study of hepatitis B virus infection among blood Donors and Risky Groups in Diyala. *Diyala Iraqi J. Comm. Med. JAN. 2006* 19 (1).
- 15-Urbani S, Fagnoni F, Missale G, and Franchini M. The role of anticore antibody response in the detection of occult hepatitis B virus infection. *ClinChem Lab Med*. 2010; 48(1):23-9.
- 16-Kleinman S.H, Kuhns M.C, Todd D.S, Glynn S.A, McNamara A, DiMarco A, Busch M.P. Frequency of HBV DNA detection in US blood donors testing positive for the presence of anti-HBc: implications for transfusion transmission and donor screening. *Transfusion* 2003; 43: 696-704.
- 17-Kleinman S.H, Strong D.M, Tegtmeier G.G, Holland P.V, Gorlin J.B, Cousins C, Chiacchierini R.P, Pietrelli L.A. Hepatitis B virus (HBV) DNA screening of blood donations in minipools with the COBAS AmpliScreen HBV test. *Transfusion* 2005; 45: 1247-1257.
- 18-Ameen R, Sanad N, Al-Shemmari S, et al. Prevalence of viral markers among first-time Arab blood donors in Kuwait. *Transfusion* 2005; 45: 1973-1980.
- 19-Alavian SM, Fallahian F, Lankarani KB. The Changing Epidemiology of Viral Hepatitis B in Iran. *J Gastrointestin Liver Dis* December 2007; 16 (4) : 403-406.
- 20-Qureshi H. Prevalence of hepatitis B and C viral infections in Pakistan: findings of a national survey appealing for effective prevention and control measures. *Eastern Mediterranean Health Journal*, 2010, 16(Suppl.):S15-S23.
- 21-Memon MR, Shaikh AA, Soomro AA, Arshad S, Shah QA. Frequency of hepatitis B and C in patients undergoing elective surgery. *J Ayub Med Coll Abbottabad* 2010; 22(2).
- 22-Al Awaidy S, Abu-Elyazeed R, Al Hosani H, et al. Seroepidemiology of hepatitis B infection in pregnant women in Oman, Qatar and the United Arab Emirates. *J Infect* 2006; 52:202-206.
- 23-Shafiq MY. Prevalence of Hepatitis B virus in hemodialysis patients infected with Hepatitis C virus in Mosul district/Iraq. *Iraqi J. of Gastroenterology* 2011; 3 (1): 52-60.
- 24-A. Wasley, S. Grytdal, Gallagher K. Centers for Disease Control and Prevention. Surveillance for acute viral hepatitis-United States, 2006. *MMWR Surveill Summ*, 57 (2008), pp. 1-24