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Prevalence of Hepatitis B Virus and Hepatitis C Virus in Population at Risk in Al-Anbar Governorate

Dr. Ammar Kkalid Sabbar
M.B.Ch.B., Diploma of Internal Medicine, Master Echocardiography, Iraqi Ministry of Health, Al-Anbar Health Directorate, AL-Ramadi Teaching Hospital, Al-Anbar, Iraq

Dr. Rasheed Chasib Salih
M.B.Ch.B., D.C.H., Anesthetist, Iraqi Ministry of Health, Baghdad Al-Karkh Health Directorate, Karkh Maternity Hospital, Baghdad, Iraq

Dr. Riyadh Mathlom Mohsin
M.B.Ch.B., Master Echocardiography, General Cardiac Medicine, Iraqi Ministry of Health, Meisan Health Directorate, Meisan Cardiac Centre, Meisan, Iraq

Abstract

Objective: This retrospective study aims to estimate the prevalence of Hepatitis B virus (HBV) and Hepatitis C virus (HCV) with respect to sex, age, and location (cities and towns) in the Al-Anbar governorate.

Patients and method: A sample of 1688 individuals was obtained from records of the Al-Ramadi Public Health laboratory in Al-Anbar governorate during 2008. Identification of positive cases had been done with respect to the results of HBs Ag test and HCV Ab which were done by ELIZA system.
Result: 1- The prevalence was found to be (14.86%)and (3.08%) for HBV and HCV, respectively. 2-The prevalence of HBV and HCV in 2008 are higher than in previous years (2000-2007) in Al-Anbar governorate.

Keywords: Hepatitis B virus (HBV), Hepatitis C virus (HCV), liver, Hepatitis A.

Introduction. Viral hepatitis is an inflammation of the liver; it is caused by viral infection. There are several types of viral hepatitis, and they are given alphabetical names (A, B, C, D, E, F, and G) [1,2]. Hepatitis B is the 1st human virus hepatitis was isolated in 1969. This was followed quickly by the purification of hepatitis A in l973 and hepatitis C in 1989. There are more than 20 other viruses which infect the human 1iver; these are not considered ’hepatitis viruses’ as these other viruses tend to infect organs other than the liver more seriously [3]; these include common viruses such as

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cytomegalovirus, mump, and rubel1a, as well as rare ones such as Lassa fever and yellow fever viruses [4] Hepatitis B and C viruses is a major health issue, worldwide especially in developing and undeveloped countries. It is responsible for significant morbidity and mortality in these countries. Prevalence of hepatitis C varies from 0.5 % to 29% in different parts of the world. WHO estimated that about 170 million people, i.e.,3% of the world population, are infected with the Hepatitis C virus (HCV) and at risk of developing liver cirrhosis or hepatocellular carcinoma [5,6,7]. Similarly, hepatitis B virus (HBV)infection is another global health problem, with 350 million people being carriers worldwide [8,9]

The endemicity of HBV among adults in the general population is variable, so countries are classified as having low endemicity <2%, intermediate endemicity (2-5%), and high endemicity (>5%) of infection (4). Iraq is considered within countries with an intermediate endemicity, according on previous reports (5,6). Little reports appear on the prevalence of HBV and HCV infection in Iraq.

In 2010, the World Health Organization (OMS) included viral hepatitis as a priority in public health plans based on the cost of vaccination [10,11,12]. The World Health Assembly established that all countries are implementing or improving epidemiological vigilance plans and the ability to diagnose VHC infection [13,14]. The year 2016 presents the global health sector strategy that entailed a 65% reduction in hepatitis C virus-related deaths by 2030 and a 90% reduction in infections. This strategy mainly lies in the disinfection of health units, mandatory notification of cases, registry of cases of cirrhosis and liver cancer, strengthening of diagnostic, treatment, and development systems, and the possibility of treatment with antiviral drugs [15,16]. OMS estimates that there are 71 million people with chronic hepatitis C and 400,000 deaths annually [17,18,19]

The prevalence reported in studies in different populations worldwide against hepatitis C virus (anti-HCV) ranges between 0.5 and 10%. The World Health Organization estimates that approximately 3% of the world's population is infected with the hepatitis C virus (HCV) (1). Populations at risk of contracting the virus are intravenous drug users due to the shared use of syringes, hemophilia patients, dialysis patients, and, to a lesser extent, sex workers. [20]

The aim of this study was to determine the prevalence of hepatitis C virus in different population groups in Anbar city who are considered at risk of hepatitis C virus infection.

Aims of the Study

This study aims to estimate the prevalence of viral hepatitis type B and C in AL-Anbar governorate.

Patients and method:

In the retrospective study:

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The sample: During the period between January 2020 to August 2022, a total of 1688 samples of individuals were obtained from records of the Al-Ramadi Public Health laboratory, including blood donars, suspected cases, and high-risk groups (contacts, hemodialysis patients, health workers, midwives, food handlers and barbers) in Al-Anbar governorate.

B-Test Procedure: Identification of positive cases had been done with respect to the results of the HBsAg test and HCV Ab which were done by Enzym-Linked Immune Surbant assay (ELIZA) system.

C-Statistical methods: Prevalence was used in this research work to give an idea about the extent of viral hepatitis in the Al-Anbar governorate.

$$\text{Prevalence} = \frac{\text{no. of existing cases (old and new cases)}}{\text{Population at risk}}$$

The chi-square T-test are used in order to detect whether male and female percentages for positive cases are significantly different.

Result:

The total no. of the sample examined during 2008 was 1G88 individuals were recorded; 1475 (87.38%) of them were males, and 213 (12.6 %) Were females.

The total positive cases for HBV were 251 (14.86%). 194 (13.15%) were males, and 57 (2fl.7G%) were females.

The distribution of numbers and percentages of infected cases according to sex and types of viral hepatitis, together with the total number of examined cases in the AL-Anbar governorate, have been shown in table 1.

Table 1. The Distribution of no. of positive cases of HBV and HCV by gender in AL-Anbar governorate.

Sex	Total	HBV +ve %	HCV +ve %
Male	1475	194 13.15%	50 3.38%
Female	213	57 26.76%	2 0.93%
Total	1688	251 14.86%	52 3.08%

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The total positive cases for HCV were 52 (3.08s).50 (3.08%) of them were males, 2 (0.93%) of them were females.

By using the chi-square test, which shows that the percentage of male positive cases among total male suspected cases is higher significantly than females in viral hepatitis B (P<0.01) Table 2.

The mean age of all positive cases (males and females) for HBV is round to be 32.64 years, with a standard deviation of 11.24 years. The minimum age is found to be 3 Years, whereas the maximum age is found to be 67 years.

The age distribution of HBV Positive is shown in Figure 1.

Figure 1. The age distribution of all positive cases for Hepatitis B virus in Al-Anbar governorate in 2008.

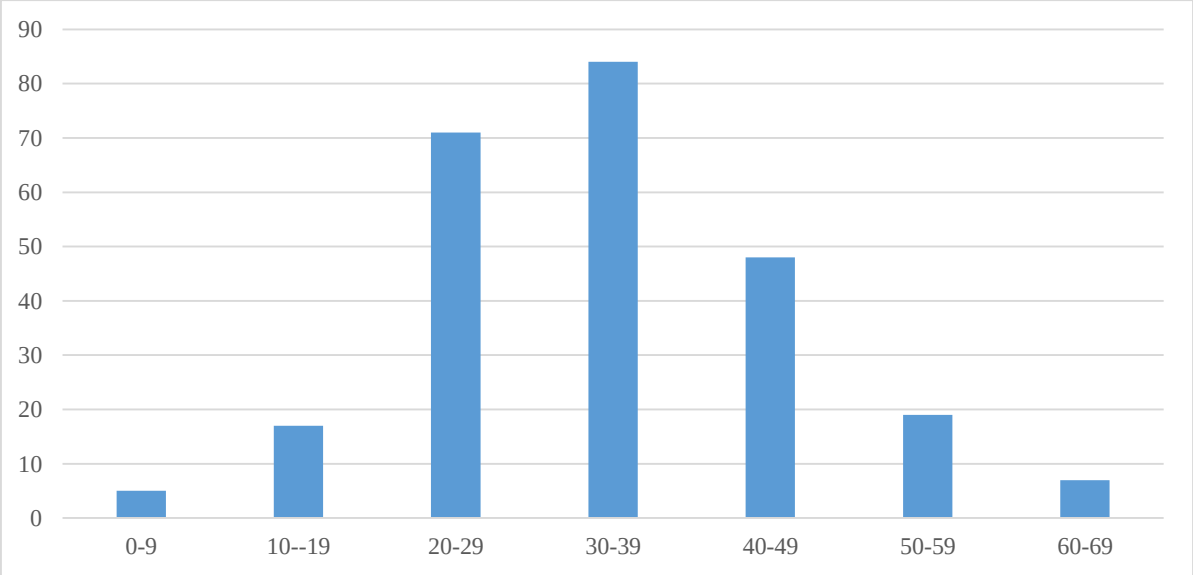

Table 2: The+ve and-ve cases of HBV in 2008 in AL-Anbar governorate.

Sex	HBV+ve	HBV-ve	Total
Male	194	1281	14 75
Female	57	156	213
Total	251	143 7	1688

Similarly, in HCV, the chi-square test shows that the percentages of male positive cases among all male suspected cases were high significantly higher than females (p<0.01) Table 3.

Table 3: The positive and negative cases of HCV in 2008 AL-Anbar governorate.

Sex	HCV+ve	HCV-ve	Total
Male	50	1425	1475

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Female	2	21 l	213
Total	52	1636	1688

Table 4: Age and sex distribution of HBV in AL-Anbar governorate in 2008.

Age	No. of we Male (%)	No. of+ve Female (%)	Total no. of +ve females and +ve males
0-9	2	3	5
10-19	5	12	17
20-29	54	17	71
30-39	71	13	84
40-49	42	6	48
50-59	16	3	19
60-69	4	3	7
Total no.	194	57	251

With respect to HCV, the mean age of positive males is found to be 34.74 years with a standard deviation of 11.49 years, whereas the mean age for females is found to be 36.5 with a standard deviation of 7.77 years. Figure 2.

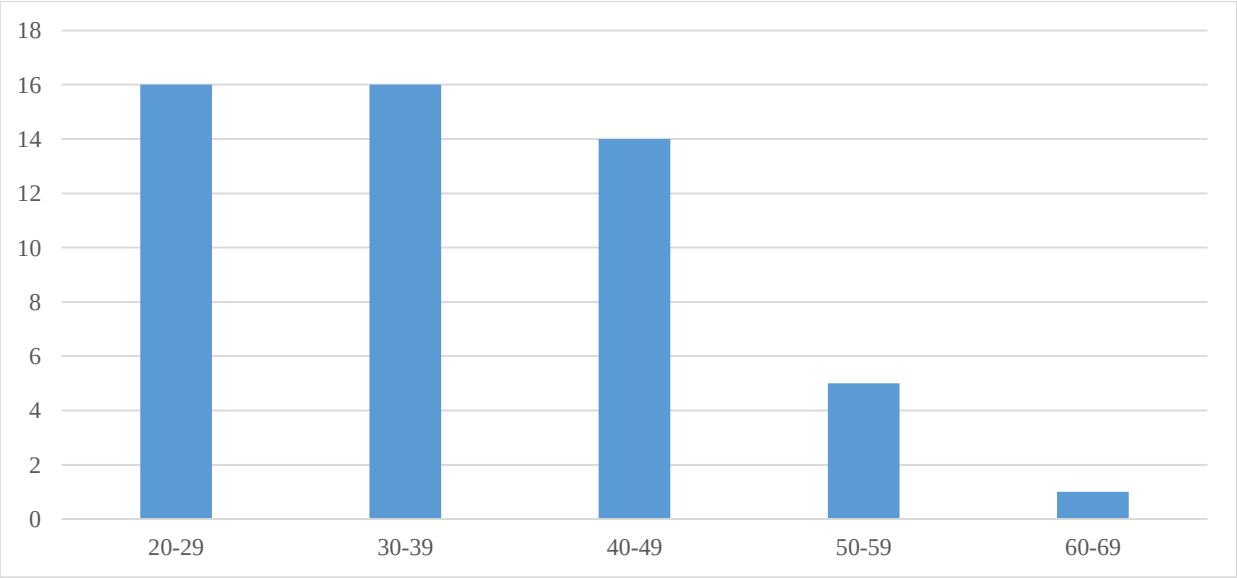

Figure 2. The age of all positive cases for HCV in AL-Anbar governorate in 2008.

The minimum age for positive cases of HCV is found to be 20 years, whereas the maximum age is found to be 65 years.

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Table 5. Age and sex distribution of HCV in AL-Anbar governorate in 2008.

Age	No. of+ve Male (%)	No. of+ve Female (%)	Total no. of +ve cases
0-9	0	0	0
10-19	0	0	0
20-29	16	0	16
30-39	15	1	16
40-49	13	1	14
50-59	5	0	5
60-69	1	0	1
Totale	50	2	52

By using the two-sample t-test, we found (t= -0.23p>0.05) this means there is no significant difference between the mean age of males and females positive for HCV. Table 5.

The geographical distribution of HBV and HCV in the AL-Anbar governorate during 2008 is presented in Table 6.

Table 6. Geographic distribution of HBV and HCV in Al-Anbar governorate during 2008.

Location	HBV No. of +ve cases	HCV No. of +ve cases
AL-Ramadi	130	41
Faluja	33	4
Hit	0	0
Haditha	1	2
AL-Qaim	1	1
AL-Khalidiah	84	2
AL-Rutba	1	1
Ana	1	1

Table 7. The population size of the cities of AL-Anbar governorat is based on the Wikipedia network.

Location	The population size
AL-Ramadi	442000
Faluja	500000
Hit	150000
Haditha	100000

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AL-Qaim	175000
AL-Khalidiah	116000
AL-Rutba	25000
Ana	60000
total	1568000

According to the estimated population size, the prevalence of the disease for each city has been calculated to every 10,000 of the population, and the results are listed in Table 8.

Table 8. Prevalence of HBV in the cities of AL-Anbar governorate based on estimated population size for each 10000 of the population.

Location	The prevalence
AL-Ramadi	2.94
Faluja	0. 66
Hit	0
Haditha	0.1
AL- Qaim	0.057
AL-Khalidia	7.2414
AL-Ruttba	0.4
Ana	0.166

Discussion:

In this study, we plan to have an idea about the prevalence of HBV and HCV infection in the AL-Anbar governorate according to records of the Central Health Laboratory, which is directed by the Ministry of health.

The prevalence of HBV-infected cases in the AL-Anbar governorate are varied from city to city, with arrange varied from zero to 7.4% (average 3.7%). This puts the AL-Anbar governorate to lie in an intermediate endemicity area for HBV infection. This difference in prevalence from one city to other may be due to differences in lifestyle, socioeconomic status, and education background of the population from city to city.

If we compare this study with other studies in Iraq, in the National Blood Bank, the statistics showed that the carrier rate of HBV was I.3-2.5% over the years 1989-1999, but the majority of the involved cases were healthy 18-50 years old male donors (7).

The other study showed a carrier rate of HBV was 2.8% in ethnic Arabs in Iraq in 1973 (5). These two studies approaching with our study in respect to endimicity. In comparison with the study about the prevalence of HBV in the AL-Anbar governorate prior to the war (1999-2002), which was low

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endemicity. (I.7%) (10).

This may be attributed to a better lifestyle, less drug abuse, and less contact with endemic countries (less traveling out of Iraq).

In comparison with the previous study, which is done after the war in AL-Anbar governorate, low endemicity has been found.

This may be attributed to the poor security situation, which leads to difficulty reaching laboratory health centers and traveling between cities. Hence, many cases would be missed (9). While in our study, we found that the AL-Anbar governorate comes in an intermediate endemicity (3.7%); this may be attributed. To good security situation leads to simple travelingto laboratory health centers and between many cities and countries, so increases the contact with infected persons and increases referred cases for screening from hospitals and outpatients to laboratory health centers. HBV is the most common than HCV infection in the AL-Anbar governorate. In this study also revealed the age groups; the highest prevalence was 30-39, and 20-29, respectively. This age groups are riskier to horizontal transmission, which is particularly more common in childhood and adult via a minor break in the skin and mucus membrane or close body contact with infected peoples, which account for more cases of chronic hepatitis (HBV)infection in intermediate endemicity areas(Middle East countries including Iraq).

According to the cities of infection in the AL-Anbar governorate, this study showed that AL-Khalidia city has scored the highest frequency of infection among all other cities of the AL-Anbar governorate. With respect to sex, the female percentage is significantly higher than males in HBV; this may be due to the fact that examined females are suspected cases while males are mostly healthy donors.

The percentage of females who have HCV was found to be lower than that of males; this may be due to contact with risk factors between males and females are different.

Conclusion and Recommendations

1. HBV is a preventable disease, and vaccination may play a great role in reducing the prevalence of the disease and its complications, which including liver cirrhosis and hepatocellular carcinoma.
2. Iraq was considered as having intermediate endemicity for HBV, with a prevalence rate equall to 4-5%. Similarly, the endemicity in our study in the AL-Anbar governorate is intermediate, with a prevalence rate ranged from 0 - 7.4% for each 10000 of the population.

It is wise for us to be more concerned about the risk factors of viral hepatitis transmission, especially the use of medical instruments (syringes) and surgical and dental instruments, which is still a real problem in this governorate.

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