

Prevalence of Hepatitis B and C in Thi-Qar Province - Iraq from 2015-2019

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ABSTRACT

Background: Hepatitis B virus and hepatitis C virus are two of the most commonly transmitted infectious agents by Blood transmitting so it is still remains a considerable global health problem, this prospective cross-sectional study was conducted between 2015 and 2019 at the directorate of main Blood Bank, dialysis center, thalassemia center and public health laboratory in Thi-Qar Province -Iraq, during that period a total of 1323 patients, 948 (71.7%) males and 375 (28.3%) females, they suffering from signs and symptoms of liver diseases.

The aim of study: There were no adequate epidemiological studies on the prevalence of viral hepatitis, especially in last years and there were no national solutions to limit it's, we conduct this study to determine the prevalence of both types at Thi-qar province.

Sampling and methods: This study was conducted in January 2015 to December 2019, on main blood bank, patients referred to the thalassemic center, renal dialysis unit and public health laboratory at Thi-Qar province, the study was conducted on 176848 individuals, from those (1323) cases, (515) blood donors, (45) thalassemic patients, (91) renal failure patients and public health laboratory (672), the following data were recorded: Age, sex, date, resident, type of infection, data were collected by from statistical units. Data were analyzed using SPSS for windows (version 23.0, SPSS Inc, Chicago, Ill), for comparison between groups as appropriate; $P \leq 0.01$ was considered statistically significant.

The results: The results of infection were found 1323(0.7%), its distributed as :672 (50.8%) were public health laboratory patients, 515 (38.9%) blood donors, 91 (6.9%) renal dialysis patients and 45(3.4%) thalassemic patients, the results was showed higher infection in males more than females, with high prevalence in age groups (31-40) and (41-50) years, with significant difference ($P < 0.01$).

Conclusions: despite the findings revealed that Thi-Qar is acceptable percentage rate of prevalence of infection, but may be increased the infection by Immigration from endemic areas, especially for business, transfusion of blood, a major roots of infections by renal dialysis, thalassemic patients were a risk groups because administration of blood.

Keywords: Hepatitis B virus, Hepatitis C virus, dialysis, thalassemia, Thi-Qar Province.

INTRODUCTION

The liver is the largest organ in the right side of the abdomen with several functions, the most important of which is blood filtering, ridding the body of toxins, and also converting nutrients into substances that will benefit and then store them, the liver may be exposed to some health problems due to exposure to viral infections, alcoholism and some toxins (Lam and Perez, 2018).

The inflammation of the liver due to viral infection means hepatitis (Wogu et al., 2019), which is the main cause of hepatocellular carcinoma (Taylor et al., 2017; Ahn et al., 2018).

A global health problem with (HBV) and (HCV) infections, these viruses attack the liver and can cause both acute and chronic hepatitis infection (Özkan, 2018).

HBV is a double-stranded DNA virus, small genome has a partially circular, encapsidated by proteins core (Huang et al., 2020) it's a "*Hepadnaviridae*" family, "*Avihepadnavirus*" genus (Yan et al., 2012; Machač, 2019).

HCV is a single-stranded RNA genome, it is a encapsulated RNA virus, classified into the "*Flaviridae*" family,

"*hepacivirus*" genus (Bennett et al., 2014; Hinnebusch, 2014).

Many infections every year due to viral hepatitis, approximately 90% of these fatalities results from HBV, HCV and about 10% of fatalities are due to other hepatitis viruses (WHO, 2016, Wiktor and Hutin, 2016), the National academies of science and the National viral hepatitis action was published a strategies plan in 2017 to reducing hepatitis B. (NASEM, 2017; King et al., 2020).

In Iraq, there is a prevalence of viral hepatitis unevenly among the governorates for example, viral hepatitis infection obtained in Basra- Iraq by that indicated hepatitis prevalence was 0.12% (Ataallah et al., 2011, Al-Rubaye et al., 2017) a similar study conducted in Babylon governorate showed the prevalence was 0.7% (Al-Juboury et al., 2010), another study showed the prevalence was 0.66% in Najaf governorate and 3.5% in Karbala (Mahmood et al., 2001).

The aim of study

Study was aimed for determination epidemiology and the prevalence of HCV and HBV among blood volunteers, renal failure patients and thalassemic patients at Thi-Qar province through:-

- 1-Determination the percentage of HBV & HCV infection among blood volunteers.
- 2-Detection the rate of infection among patient of renal failure.
- 3-Detection the percentage of infection among thalassemic patients.
- 4-Collection the data including (age, sex, educational level, resident).
- 5-Statistical analysis for the results was done.

METHODOLOGY

Ethical consideration

An authorization to conduct the study was obtained at Health office in Thi-Qar /training department, number 631/ dated 27/8/2019, the most widely accepted guidance on medical research. using an agreement letter prepared to include study places such as the central blood bank, thalassemia center, dialysis center and public health laboratory, where prior approval for the purpose of the study only.

Collection of data

The study aimed by assessing prevalence (HBV and HCV) infection, data was collected from the central blood bank, thalassemia center, dialysis center, and public health laboratory, the research method for this study was according to the study by Al Badry (2015),

This study was carried out between January 2015 to December 2019, data was collected from registration in the units of mentioned centers, in the blood bank, donors underwent a personal questionnaire, physical examination as well as pre-donation investigations that included the hemoglobin (Hb) level and blood pressure , data is collected for all months of the years, the donated blood bags were serologically screened by enzyme-linked immunosorbent assay (ELISA technique) (Al-Rubaye *et al.*, 2016), in the dialysis center, there is a special part for dialysis of patients with viral hepatitis, so it was noted that the necessity of performing a laboratory test before the dialysis process.

Types of data

All the patient screening registers were retrieved from the departmental archives and relevant donor information, including gender, age, occupation, blood group, type of

donation and results of rapid tests for HBsAg, HCV, samples were collected by technicians in the main blood bank, thalassemia center, dialysis center, and public health laboratory, the total number of all investigated persons was obtained, in addition to the numbers of people with viral hepatitis for all years of study parameters recorded :

A total of 176848 persons they were studied, from different region of the province referred to, main blood bank, dialysis center, thalassemia center and public health laboratory.

Some data were recorded including gender, age group which included ages from 1< to 70 years, nationality, (Iraqi or foreign), resident. The type of infection was classified according to the type HBV, HCV or (dual) of infection.(Shafique *et al.*, 2020).

Study periods

The study period is five years, from January 2015 to December 2019, and also the study was recorded the investigation and infection during the month of each year.

Statistical analysis

After data collection, the statistical package for social sciences, chi-square test and frequencies were used, descriptive statistics for categorical data were expressed as frequency and percentage, Chi -square test was using for the comparison of categorical data, p-value of <_0.01 was considered as the level of significant, all analyses were performed with the statistical analysis make statistical for social sciences SPSS (version 23.0, SPSS Inc, Chicago, III).

RESULTS

Sampling

The present study was conducted on (176848) persons of different locations of Thi-Qar province, different ages and sex.

The results showed that (1323) patients (during the period from 2015 to 2019), were infected with hepatitis and distributed as following: public health laboratory 672(50.8%), main blood bank 515 (38.9%), dialysis center 91 (6.9%) and thalassemia center 45 (3.4%), as shown in the figure (1) below:

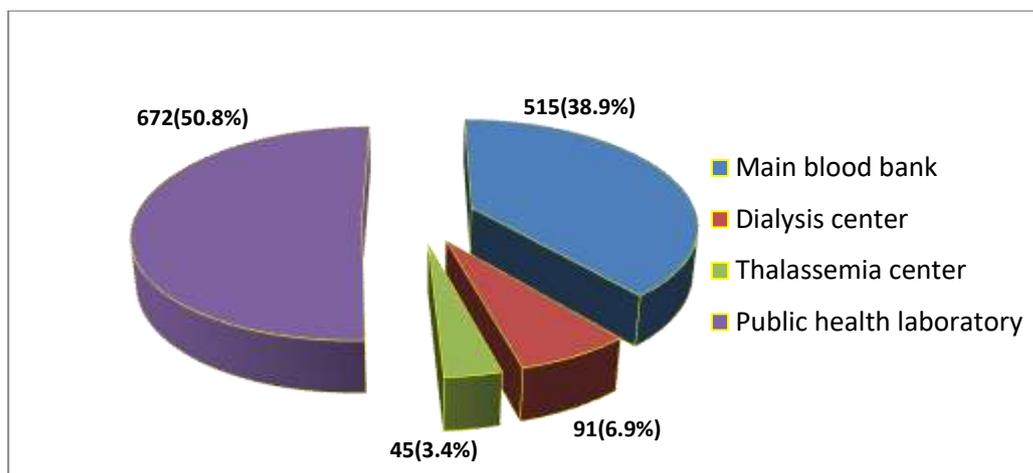


Figure 1: Distribution of infections (1323) from the study regions for the period (2015- 2019)

The prevalence of infections was calculated to be 0.7%. Most of the investigated people was referred to main blood bank at the province and public health lab.(140666) and (33022) respectively, the results showed that the highest percentage of

infections for 5 years was at public health lab(50.8%), followed by main blood bank(38.9%), while the lowest percentage was at the thalassemia center which reached (3.4%) (Table-1).

Table 1: Distribution of HBV and HCV infection for five years at Thi-Qar province.

Location	Investigation	Infected No.	%	Percentage from total infected
Main blood bank	140666	515	0.37	38.9
Public health lab.	33022	672	2	50.8
Dialysis center	2155	91	4.2	6.9
Thalassemia	1005	45	4.5	3.4
Total	176848	1323	0.74	100

Cal.X²: 95.43 Tab.X²: 11.34 df: 3 P-value: 0.01

The prevalence of infection of five years showed the percentage of males was 948 (71.7%) comparison with female was 375 (28.3%) with significant differences (p<0.01), highest percentage of male was in main blood bank 501 (97.3%) comparison with females 14 (2.7%), followed by public health

lab. 381 (56.7%) were male and 291 (43.3%) females, dialysis center 46 (50.5%) and 45 (49.5%) respectively, then thalassemia center 20(44.4%) and 25(55.6%) for males and females respectively. (Table: 2).

Table 2: Distribution of HBV and HCV infection according to Gender for five years at Thi-Qar province.

Location	Total patients	Gender		Female	
		Male No.	%	No.	%
Main blood bank	515	501	97.3	14	2.7
Public Health Laboratory	672	381	56.7	291	28.3
Dialysis Center	91	46	50.5	45	49.5
Thalassemia center	45	20	44.4	25	55.6
Total	1323	948	71.7	375	28.3

Cal.X²: 276.91 Tab.X²: 11.34 df: 3 P-value: 0.01

The results showed the total number of infection for five years reached 1323 cases, of those 634 (47.9%) infected with HBV, while 677 (51.2%) infected with HCV

Only 12 (0.9%) cases infected with (dual) both HBV & HCV, highest percentage of infections with HBV was among patients referring to public health lab. 363 (45.1%), followed

by main blood bank 259 (50.3%), also the highest percentage of infection with HCV which was at public health lab. 304(45.2%), followed by main blood bank 251 (48.7%), the percentage of infection with both HBV & HCV was 5 (1%) and (0.7%) respectively in each of blood bank and public health lab. While 2 (16.6%) in dialysis center. (Table: 3).

Table 3: Distribution of HBV and HCV infection according Type of infection for five years at Thi-Qar province.

Location	Type of infection							
	Total infections	HBV		HCV		Dual		
		NO	(%)	NO	(%)	NO	(%)	
Main blood bank	515	259	50.3	251	48.7	5	1	
Public Health Laboratory	672	363	54.1	304	45.2	5	0.7	
Dialysis Center	91	9	9.9	80	87.9	2	2.2	
Thalassemia center	45	3	6.7	42	93.3	0	0.0	
Total	1323	634	47.9	677	51.2	12	0.9	

Cal.X2: 96.42 Tab.X2: 16.81 df: 6 P-value: 0.01

On this study the results showed the high prevalence hepatitis among age groups 31-40 years 329(24.9%), followed by age group 21-30 were 312(23.6%) ,the lowest infection percentage in age group (1<10) were 38(2.8%). (Table: 4)

Table 4: Distribution of HBV and HCV infection according age grouping for five years at Thi-Qar province

Age group	Total patients	1-10		11-20		21-30		31-40		41-50		51-60		61-70	
Location															
Main blood bank	515	0	0	33	6.4	155	30.2	181	35.1	97	18.8	34	6.6	15	2.9
Public Health Laboratory	672	30	4.5	68	10.1	140	20.8	129	19.2	135	20.1	88	13.1	82	12.2
Dialysis Center	91	0	0	8	8.8	5	5.5	13	14.3	27	29.7	23	25.3	15	16.4
Thalassemia center	45	8	17.8	17	37.8	12	26.7	6	13.3	2	4.4	0	0	0	0
Total	1323	38	2.8	126	9.5	312	23.6	329	24.9	261	19.7	145	11.0	112	8.5

Cal.X2: 247.08 Tab.X2: 34.81 df: 18 P-value: 0.01

DISCUSSION

All infection of liver mean hepatitis, that can cause a health problems and may be fatal, but this infection differ in modes of transmission, finally related death by cirrhosis and liver cancer. Globally the prevalence of HBV it is 257 million, divided by 21 million Eastren Mediterranean, 15 million Europe, 39 million South-East Asia, 7 million Americas, 115 million Western pacific, 60 million Africa, as for the prevalence HCV globally were 71 million, divided by 15 million Eastren Mediterranean, 14 million Europe, 11 million South-east Asia, 7 million America, 14 million western pacific, 10 million Africa, the dual infection (HBV & HCV) 327 million were divided by 36 million, 29 million, 49 million, 14 million, 129 million, 70 million, in this regions respectively (WHO,2016;Lingani et al.,2018) , hepatitis B and C virus are blood borne viruses, spread in Iraq and all worldwide (Hussein et al.,2017), in 2015, globally about 1.34 million people died from complications viral hepatitis (WHO,2016; Sallam et al.,2020).

The higher prevalence areas were include of Egypt and other Mediterranean regions followed by sub-Saharan Africa (Lavanchy,2011).

According to WHO, Iraq is a low endemicity country for HBV & HCV by study in Mesan (Kadhemi et al.,2019), from

total population(37140000) Iraqi people, 3674 cases HBV, while HCV 929 cases were reported (WHO.,2016).

Regarding Thi-Qar province, Iraq, there was no previous studies on the prevalence of viral hepatitis in the last five years

This study was done for determining prevalence viral hepatitis infections (HBV and HCV) and the association with age and gender of patients in Thi-Qar province, Iraq.

The present study revealed that 1323 (0.7%) out of 176848 investigated persons were infected with hepatitis. this result is less than previous studies conducted by Hussein (2010), and all these consider low percentage when comparing with the percentages of infections which reach 40% in other countries (Arora & Mann, 2007), the result in table (1) showed the percentage of infection is an acceptable rate compared to other countries, these viruses are prevalent in different parts of the world , the prevalence of HBV is 2.0% in USA, 8.0-20.0% in South- East Asia, the prevalence of HCV 4.8% in Pakistan, 3.2% in china and 22% in Egypt (Asnake, 2017), also in our study showed significantly high prevalence in public health laboratory 672/ 1323 this because this center provides services to the general public including: patients referred from government and private clinics as well as expatriates from outside the country, businesses and those who marry, followed main blood bank were 515/1323 because it is the main central in the governorate and all cases

of blood donation and examination will be in it the number of infected patients (515) in comparing with the number of investigated persons in blood bank (140666), the percentage appear low (0.4%), then dialysis center 91/1323 this disagreement with study in Bagdad (Ibrahim and Hashem, 2019), lowest prevalence of infection among thalassemic patient was 45(3.4%), because Thalassemia patients are a limited group of society and a genetic disease need to transfusion of blood continually which make them at high risk of infection, with significant difference ($P < 0.01$), in table (2) the results showed a statistically significantly higher seroprevalence of hepatitis in males than females, 984 (71.7%) and 375 (28.3%) we showed higher percentage in main blood bank 501 (97.3%) while female 14 (2.9%) this may be due to that males dominantly are the blood donors , followed in public health laboratory 381 (50.7%) were male, and 291 (43.3%) were female, this difference may be due to that men are more productive and exposure to infection , addition the male more responsibilities, and from the reasons this could possibly through the common use of razors and shaving at barber shops and males more than females for travel (Abass et al., 2009 ; Hussein, 2015), the results showed significant difference ($P < 0.01$) of infections among males and females.

The results of this study showed higher prevalence of HCV was 677/1323 (51.2%), while HBV 634/1323 (47.9) and dual infection were 12/1323(0.9%), study conducted by (Roushan et al., 2016), also a similar study with higher prevalence HCV than HBV by (Manisha et al., 2015), the majority protective against HBV was a vaccination, HCV is major problem among thalassemia patients because multi transfused, blood donors and dialysis center, we need optimal control and implement ,tested blood donors and screening of blood and produces it .

In table (4), showed high rate of HBV, HCV and dual infection in age group 31-40 years, were (329) followed in age group 21-30 year (312) while lowest percentage in the age group (1<-10) this significant relationship might be due to the age 21 to 40 years old implies, often sexually active, more uses of razors, tattoos, Botox injection, age of delivery (Stevens et al., 2016).

CONFLICT OF INTEREST: Nil

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