

The Incidence of Hepatitis C Virus Infections among People Screened in Governmental Health Care Facilities in 2018 in Iraq

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Abstract

Background: The HCV the objectives of this study were to estimate the incidence of HCV infection (anti-HCV antibodies) in Iraq. **Methodology:** The criteria for diagnosis of HCV infection included new seroconversion manifested by the presence of positive HCV antibodies by screening tests and ascertained this result by confirmatory assays in the year 2018. The patients with HCV positive seroconversion recorded before 2018 are excluded from HCV incidence in 2018. The primarily positive cases were tested by anti-HCV antibodies confirmatory test prior to recording as new HCV infected cases. A sample size of 97,290 persons from the all 18 Iraqi governorates was enrolled in this study. **Results:** Among 97,290 persons screened for HCV antibodies, 576 new HCV infections were recorded as newly infected with incidence rate of 5.9:1000 among all Iraqi governorates in 2018. The highest incidence was reported in Baghdad-Resafa, Diwaniya, and Sulaymaniyah, and they were 15.2:1000, 13.7:1000, and 13.2:1000 respectively; the lowest incidence rates were registered in Erbil, Diyala, and Najaf and the results were zero, 0.32, and 0.53 respectively. In all Iraqi governorates, the highest incidence of HCV infection was at the age group 15–45 years and the lowest was in age group 1-4 years. For the total 576 new HCV recorded infections, 296 were males and 280 were females, with male to female ratio of 1:1.1.

Conclusion: The incidence rate of HCV infection is high among people screened for anti-HCV Abs in Iraq in the year 2018 especially in Baghdad-Resafa, nearly both genders are equally affected and HCV infection is mostly recorded in age group 15-45 years. The HCV screening program should be achieved in all regions of Iraq and for all the required population groups, and it should be a compulsory measure.

Keywords: Hepatitis C Virus, Infections, incidence, Iraq

Introduction

Hepatitis C virus (HCV) is a common cause of chronic hepatitis worldwide and it is an important cause of liver cirrhosis and hepatocellular carcinoma⁽¹⁾. Because HCV is a blood borne disease, it is more common among people exposed to contaminated blood or contaminated blood products⁽²⁾. Epidemiological measures like the prevalence and incidence of HCV infections are important in understanding the existence

of HCV infection and its endemicity among population for future planning to control this infection⁽³⁾.

Globally, the incidence of HCV infections has been reported in some countries, and it is mostly determined by measuring the seroconversion in a person who is previously negative for anti-HCV antibodies, however, it is difficult to appraise if this is acute or chronic infection^(4, 5). Epidemiologically, the prevalence of HCV infections is measured more frequently than incidence because the available laboratory tests cannot distinguished between acute infections, chronic infections, or even the cured infections as these tests are measuring the anti-HCV antibodies rather than HCV antigens⁽⁶⁾. The incidence is a fundamental epidemiological measure; it represents

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the number of new cases over a particular time in a given population. The incidence of HCV infection is important in study the susceptibility of people in different periods by comparing the new registered cases; moreover, it can study the risk of HCV infections among different people subgroups (7).

The Incidence of HCV infections in Iraq has not been estimated before, in this study we aimed to measure this valuable epidemiological marker and comparing the susceptibility of different subcategories to HCV infections. The aim of this study is to estimate the incidence of the infections with hepatitis C virus in Iraq in the year 2018.

Methodology

In this cross sectional study, we collected data from the files of peoples screened for HCV infections in Iraq in 2018. The governmental health care facilities in the all 18 Iraqi governorates screened 97,290 persons in the year 2018 for HCV antibodies, their screening was for a diverse reasons like preoperative screening, pre-employment health examination, screening before dental procedures, screening of pregnant women before labor, patients with hemodialysis, patients with thalassemia, patients with possible liver diseases, and healthy persons who seek annual screening. The criteria for diagnosis of

HCV infection included new seroconversion manifested by the presence of positive HCV antibodies by screening tests and ascertained this result by confirmatory assays. The patients with HCV positive seroconversion recorded before 2018 were excluded from registration as new cases in HCV incidence in 2018. Two parameters, gender and ages are included as risk factors for HCV infections. The capital of Iraq, Baghdad, was divided into two regions, Karkh and Resafa; thus, HCV screening was done in 19 Iraqi regions.

Results

The highest record of new HCV infections was registered in Baghdad-Rusafa (n=151), while the lowest was in Erbil governorate (n=zero), the total number of new cases among 97,290 persons screened for anti-HCV antibodies in Iraq in 2018 was 576 (tables 1, 2). The top three regions that recorded the highest incidence rates of HCV infections were Baghdad-Resafa, Diwaniya, and Sulaymaniyah, and they were 15.2:1000, 13.7:1000, and 13.2:1000 respectively; the lowest incidence rates were registered in Erbil, Diyala, and Najaf and the results were zero, 0.32, and 0.53 respectively. The overall incidence rate among screened individuals in Iraq was 5.9:1000. Most of HCV infections were recorded in March, July, and November as illustrated in table 1.

Table 1: The monthly reported cases of HCV infection in Iraqi governorates

No.	Province	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Grand Total positive cases
1	NINEWA	0	0	2	1	0	0	2	1	0	0	1	0	7
2	KIRKUK	1	1	4	0	0	3	2	0	1	1	2	0	15
3	SALAH AL-DIN	3	5	3	3	2	4	4	7	6	5	2	4	48
4	DIYALA	0	0	1	0	1	0	0	0	0	0	0	0	2
5	BAGHDAD-ARKH*	6	0	8	6	1	2	2	1	2	3	7	1	39
6	BAGHDAD-ESAF A*	5	17	27	19	14	18	25	9	3	4	2	8	151
7	ANBAR	0	1	0	0	0	0	4	0	0	0	0	0	5
8	BABYLON	1	0	0	0	0	0	1	0	16	28	17	15	78
9	WASSIT	0	1	1	1	1	1	7	5	5	0	5	3	30
10	KERBALA	0	0	3	0	0	0	0	2	1	0	0	4	10
11	NAJAF	0	0	0	0	0	0	1	0	1	0	0	0	2
12	Diwaniyah	0	0	2	0	2	3	0	0	1	1	8	6	23

Cont ... Table 1: The monthly reported cases of HCV infection in Iraqi governorates

13	MUTHAN-NA	0	1	0	1	0	0	0	0	0	0	0	0	2
14	THI-QAR	2	0	3	2	1	0	4	2	1	1	8	1	25
15	MISSAN	0	2	0	0	0	0	1	1	0	0	5	0	9
16	BASRAH	3	1	2	2	2	1	1	0	0	0	3	3	18
17	SULAY-MANIYAH	6	11	7	6	8	15	9	11	4	9	9	10	105
18	ERBIL	0	0	0	0	0	0	0	0	0	0	0	0	0
19	DAHUK	0	0	0	1	0	1	1	1	1	2	0	0	7
Grand Total		27	40	63	42	32	48	64	40	42	54	69	55	576

* In this record (table 1), the capital of Iraq, Baghdad was divided into two districts Karkh and Resafa due to its large number of population.

Table 2: The incidence of HCV in 2018 in all Iraqi governorates

No.	Province	Grand Total	No. of tested people	Incidence of HCV per 1000 tested persons	Incidence in %
1	Ninewa	7	9,744	0.72	0.072
2	Kirkuk	15	6,811	2.2	0.022
3	Salah Al-Din	48	5,943	8.1	0.081
4	Diyala	2	6,257	0.32	0.032
5	Baghdad-Karkh	39	10,839	3.6	0.036
6	Baghdad-Resafa	151	9,959	15.2	1.52
7	Anbar	5	3,470	1.5	0.15
8	Babylon	78	6,902	11.3	1.13
9	Wassit	30	3,192	9.4	0.94
10	Kerbala	10	4,008	2.5	0.25
11	Najaf	2	3,761	0.53	0.053
12	Diwanayah	23	2,230	13.7	1.37
13	Muthanna	2	1,679	1.2	0.12
14	Thiqar	25	4,093	6.1	0.061
15	Missan	9	3,007	3.0	0.03
16	Basrah	18	4,275	4.2	0.042
17	Sulaymaniyah	105	7,955	13.2	1.32
18	Erbil	0	1,244	0	0
19	Dahuk	7	1,921	3.64	0.036
Grand Total		576	97,290	5.9	0.059

The age distribution of HCV patients revealed that most of them (n= 343, 60%) are diagnosed in age group 15-45 years, while the least number (n=3, 0.05%) is in age group 1-4 years, table 3.

Table 3: Age distribution of HCV patients in 2018 in Iraq

Province	< 1 yr	1-4 yr	5-14 yr	15-45 yr	>45 yr	Grand Total
Ninewa	0	0	0	5	2	7
Kirkuk	1	1	0	4	9	15
Salah Al-Din	1	0	0	36	11	48
Diyala	1	0	1	0	0	2
Baghdad-Karkh	0	0	2	35	2	39
Baghdad-Resafa	4	0	10	87	50	151
Anbar	0	0	1	4	0	5
Babylon	1	0	6	42	29	78
Wassit	2	0	2	20	6	30
Kerbala	3	1	1	4	1	10
Najaf	0	0	0	1	1	2
Diwaniya	0	0	1	7	15	23
Muthanna	1	0	0	0	1	2
Thiqr	5	0	3	15	2	25
Missan	1	0	1	5	2	9
Basrah	0	2	0	5	11	18
Sulaymaniyah	0	0	1	67	37	105
Erbil	0	0	0	0	0	0
Dahuk	0	0	0	5	2	7
Grand Total	20	3	29	343	181	576

In the year 2018, both genders were affected by HCV infections, for the total 576 new HCV recorded infections, 296 were males and 280 were females, with male to female ratio of 1:1.1, and the differences between both groups are statistically not significant ($p>0.05$), table 4.

Table 4: Sex distribution of HCV patients in Iraq in 2018

Province	Male	Female	Province	Male	Female
Ninewa	2	5			
Kirkuk	9	5	Najaf	2	0
Salah Al-Din	18	31	Diwaniya	15	8
Diyala	1	1	Muthanna	1	1
Baghdad-Karkh	15	24	Thiqr	12	13
Baghdad-Resafa	92	59	Missan	3	6
Anbar	3	2	Basrah	13	5
Babylon	39	39	Sulaymaniyah	60	45
Wassit	9	21	Erbil	0	0
Kerbala	2	8	Dahuk	0	7
			Grand Total	296	280

Discussion

Two major challenges in HCV infections is that it is mostly asymptomatic disease and the absence of vaccine till now, therefore, it can be transmitted from one person to another without being noticed, thus screening of HCV Abs among people consulting health care facilities is a major tool in controlling the disease transmission. The screening for anti-HCV Abs in Iraq is usually part for screening for three viruses: hepatitis B virus (HBV), HCV, Human immunodeficiency virus (HIV), and it is done before any surgical operation, dental procedure, or labor, in addition patients with some chronic diseases and in need for blood or plasma transfusion like thalassemia patients, or patients on hemodialysis are also screened for HCV Abs. However, this screening for HCV Abs is not universal in all health care facilities of all Iraqi governorates, moreover, the private health care facilities like private hospitals and the private dermatological centers, which are in growing more and more in all Iraqi governorates, are not entirely inspected for this screening and we are not sure if anti-HCV Abs are screened in every patient who is consulting these care facilities or not. Thus, we should apply a policy to ensure that anti-HCV Abs are screened in the necessary patients or persons consulting any health care facility as inpatient or outpatient, this will be an important tool for

controlling HCV transmission.

In this study, we estimated the incidence rate among people attending hospitals and other health care centers in all Iraqi governorates, this large-scale estimation has not been done previously in Iraq, however, previous local studies described the prevalence of anti-HCV Abs in special groups of people and in limited regions in Iraq, like for example, Turkey M. Ataallah, et al, detected the prevalence of hepatitis B and C among blood donors in Baghdad⁽⁸⁾, Abdulameer K. Leelo, et al, detect the anti-HCV Abs in hemodialysis patients in Al-Diwaniyah city⁽⁹⁾, and Muayad A. Merza and his coworkers detected the anti-HCV Abs among tuberculosis patients in Kurdistan region of Iraq⁽¹⁰⁾.

In the current study, the incidence of HCV infection was 5.9:1000 which is higher than that reported by some abroad studies, for example, the incidence in thalassemia patients in Iran was 4.2/1000⁽¹¹⁾, In rural northern Italy, the adult incidence of HCV is approximately 0.5/1000 inhabitants/year in 1996⁽¹²⁾, while in France, an incidence of 0.05% new HCV infections/year was determined in patients undergoing chronic haemodialysis⁽¹³⁾. In the current study, The presence of healthy people in addition to risk group in the screening program, and the asymptomatic nature of HCV infection, make it clear that opposite to the total new 576 HCV infections

recorded in 2018 there are more number of cases not recorded in Iraqi governorates.

It is not surprising that Baghdad-Resafa has the highest incidence among Iraqi region due to high population density of this half of the capital Baghdad , In this aspect the high incidence of HCV in that region may be due to un Knowledge of infection status that associated with decreases in high-risk of infection such behaviors of individuals like sharing of injection drug equipment with individuals who have HCV infection status . The current study revealed that 60% of new HCV infections are aged 15-45 and there is an overall increase in HCV infections in adults than in children. The blood product seropositive had not been previously screened for HCV due to not available screening procedure at that time or may be due to longer exposure to risk factors for HCV at older age, this result is in accordance to that of Niu Z et al ⁽¹⁴⁾. In the current study, the HCV detection rate in males and females was nearly similar as the differences was statistically not significant with male to female ratio of 1:1.1, unfortunately it is difficult to compare this ration with the incidence in previous years as HCV infection among the gender was not recorded prior to this study.

The HCV screening program should be done before any interventional procedures, premarital, for risk groups like hemodialysis and thalassemia patients, pre-employment, and periodic for medical personnel and others in with continuous contacts with populations; this screening program should be monitored and evaluated continuously.

Conclusion

The incidence rate of HCV infection is high among people screened for anti-HCV Abs in Iraq in the year 2018 especially in Baghdad-Resafa, nearly both genders are equally affected and HCV infection is mostly recorded in age group 15-45 years. The HCV screening program should be achieved in all regions of Iraq and for all the required population groups, and it should be a compulsory measure.

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