Prevalence of Viral Hepatitis Infections in Babylon Province, Iraq, during The Interval from 2014 to 2018

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Abstract

Background: Viral hepatitis disease is a major public health problem affecting hundreds to millions of individuals worldwide. The most widely recognized types of viral hepatitis are six distinct types of hepatitis virus, referred to as A, B, C, D, E, and G which may appear in an acute or chronic form. The aim of current study was to estimate the prevalence of hepatitis A, B and C virus infections over the last five years ago from 2014 to 2018 and to determine the prevalence associated with age and gender of patients in Babylon province, Iraq, through analyzing data by descriptive statistics approaches. Methods: Current study involved 2110 positive cases who were diagnosed as having hepatitis A, Band C virus infections of age groups ranging from (< 1 to ≥ 20) years of both genders (1184 males and 926 females). Patients' information was gathered retrospectively from the medical records at The Central Public Health Laboratory of Babylon province for the period between 2014 and 2018. Results and Conclusion: The study results showed that 1868 cases (88.5\%) out of 2110 cases had Hepatitis A Virus while 205 cases (9.7\%) had Hepatitis B Virus and 37 cases (1.8\%) had Hepatitis C Virus. Also, the highest number of cases (653) of viral hepatitis infections was recorded in 2015 and the lowest number (307) was recorded in 2014. On the other hand, it has been discovered that the highest total number of cases was for Hepatitis A Virus cases (576) cases, followed by Hepatitis B Virus (60) cases and then Hepatitis C Virus (17) cases for year 2015. The analysis of results depicted the relationship between types of viral hepatitis infections and years of prevalence and revealed a highly significant association at $P$-value <0.01. Besides, the results showed that both genders were influenced with viral hepatitis, but males were more influenced gender (56.1\%) than females (43.9\%). The analysis depicted the relationship between types of viral hepatitis infections and gender of patients and revealed that they affected both genders significantly at $P$-value <0.01.

Keywords: Prevalence, gender, Hepatitis A, Hepatitis B, Hepatitis C.


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Introduction

Viral hepatitis disease is a major public health problem influencing hundreds to millions of individuals worldwide. The most widely recognized types of viral hepatitis are six distinct types of hepatitis virus, referred to as types A, B, C, D, E, and G, which may appear in an acute or chronic form causing morbidity and significant mortality including chronic hepatitis, cirrhosis and liver cancer \textsuperscript{[1]}. Hepatitis A virus (HAV) is transmitted by the fecal-oral route through close personal contact \textsuperscript{[2]}. Hepatitis B virus (HBV) is highly contagious and transmitted through parenteral, sexual and perinatal transmission routes \textsuperscript{[3]} while HCV is transmitted primarily by infected blood and drug injection \textsuperscript{[4]}.
In AL-Kut City of Iraq, during the interval from August 2018 to January 2019, the prevalence of HAV accounted for (52%) in children and both genders were influenced with hepatitis A virus with a preference of (70.5%) in males and (29.5%) in females [9]. In Tehran, Golestan and Hormozgan cities of Iran the seroprevalence of HAV were 85%, 99% and 96%, respectively. The seroprevalence of HAV in the population of these areas was (86%) without differing between males and females [6].

The prevalence of HBV and HCV infections had a wide geographical variation depending on the rate of chronic carriers and the predominant route of transmission. Approximately, 400 million individuals are infected with hepatitis B virus and 170 million individuals are infected with hepatitis C virus. Individuals infected with HBV and HCV carry a substantial risk for chronic liver illness; (5-10%) for HBV and more than (50%) for HCV [7]. Most cases of hepatitis B in the low endemic areas are related to sexual exposure while the perinatal or early childhood transmission is considered as the most widely recognized type of HBV infection in high endemic areas [8].

In Saudi Arabia, according to the reports of the Ministry of Health about Hepatitis A, B and C infections in all districts during the interval from January 2006 to December 2010, hepatitis B virus was the most predominant type representing (53%) of cases followed by hepatitis C virus (30%) and hepatitis A virus (17%) [9].

There was no independent study on the prevalence of viral hepatitis infections conducted in Babylon province. This study, therefore, was aimed to estimate the prevalence of hepatitis A, B and C virus infections over the last five years ago from 2014 to 2018 and to determine the prevalence associated with age and gender of patients in Babylon province, Iraq, through analyzing data by descriptive statistics approaches.

Materials and Methods

A total of 2110 positive cases who were diagnosed as having hepatitis A virus, hepatitis B virus, and hepatitis C virus infections were included in this study. The age of the patients ranged from (< 1 to ≥ 20) years of both genders (1184 males and 926 females). The patients’ data were gathered retrospectively from the medical records at The Central Public Health Laboratory of Babylon province for the period between 2014 and 2018. We evaluated the prevalence of viral hepatitis infections among patients in the five past years and its association with gender and age of patients.

The results of the present study were subjected to statistical analysis and analyzed through application of descriptive statistical analysis approach that included "frequencies & percentages" and inferential statistical data analysis approach used by application of Chi-squared test.

$$\chi^2_{obs.} < \chi^2_{crit.} = \text{insignificantly.}$$

$$\chi^2_{obs.} > \chi^2_{crit.} = \text{significantly.}$$

According to P-value, Highly significant (HS) at probability value <0.01.

Results

In this study, a total of 2110 positive cases of both sexes suffering from viral hepatitis A, B and C infections were documented during the period from 2014 to 2018. Of these cases it was discovered that 1868 cases (88.5%) had HAV, 205 cases (9.7%) had HBV and 37 cases (1.8%) had HCV.

Likewise, the results demonstrated that the highest number of cases (653; 30.9%) of viral hepatitis infections was recorded in 2015 and lowest number (307; 14.5%) was recorded in 2014.

On the other hand, The highest total number of hepatitis cases was for HAV (576), followed by HBV (60 cases) and then HCV (17 cases) were accounted for year 2015. The results were shown in Table (1).

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Table (1) Distribution of cases according to type of viral hepatitis infections and year of the study

<table>
<thead>
<tr>
<th>Year of the Study</th>
<th>Type of viral hepatitis</th>
<th>Total (%)</th>
<th>DF</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HAV</td>
<td>HBV</td>
<td>HCV</td>
<td>307 (14.5%)</td>
</tr>
<tr>
<td>2014</td>
<td>255</td>
<td>44</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>576</td>
<td>60</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>400</td>
<td>32</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>277</td>
<td>31</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>360</td>
<td>38</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Total (%)</td>
<td>1868 (88.5%)</td>
<td>205 (9.7%)</td>
<td>37 (1.8%)</td>
<td>2110 (100%)</td>
</tr>
</tbody>
</table>

"$\chi^2_{obs.}$ = Chi-squared observed, $\chi^2_{crit.}$ = Chi-squared critical, Df= Degree of freedom, HS= High significant".

Moreover, the prevalence of HAV, HBV and HCV infections regarding the last 5 years was (88.5%, 9.7% and 1.8%, respectively; Figure (1)).

![Figure (1)](image)

Figure (1) Prevalence of viral hepatitis infections during the period from 2014 to 2018.

This analysis depicted the relationship between types of viral hepatitis infections and years of prevalence and revealed that there was a highly significant association at $P$-value <0.01. Furthermore, infections caused by HAV, HBV and HCV were commenced in 2014 with increasing percentage to reach the peak in 2015 then started to decline in 2016 and 2017 and returned to increase in 2018 (Figure 2).
On the other hand, all 2110 viral hepatitis infection cases of age groups ranged from (< 1 to ≥ 20) years were taken (Table 2).

**Table (2) Relationship between types of viral hepatitis infections and age groups of participants**

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Type of Hepatitis</th>
<th>Total (%)</th>
<th>DF</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HAV</td>
<td>HBV</td>
<td>HCV</td>
<td></td>
</tr>
<tr>
<td>&lt; 1</td>
<td>479</td>
<td>40</td>
<td>13</td>
<td>532</td>
</tr>
<tr>
<td>1 — 4</td>
<td>809</td>
<td>74</td>
<td>15</td>
<td>898</td>
</tr>
<tr>
<td>5 — 9</td>
<td>486</td>
<td>69</td>
<td>7</td>
<td>562</td>
</tr>
<tr>
<td>10 — 14</td>
<td>91</td>
<td>10</td>
<td>1</td>
<td>102</td>
</tr>
<tr>
<td>15 — 19</td>
<td>2</td>
<td>8</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>≥ 20</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>1868</td>
<td>205</td>
<td>37</td>
<td>2110</td>
</tr>
</tbody>
</table>

\[\chi^2_{obs.} = 108.311, \chi^2_{crit.} = 18.307, P-value = 0.000\]

"\(\chi^2_{obs.} =\) Chi-squared observed, \(\chi^2_{crit.} =\) Chi-squared critical, DF = Degree of freedom, HS = High significant".

The results in Table (2) showed that viral hepatitis infections occurred in all age groups, but it was more common in children within age group (1 — 4) years with a total number of 898 (42.6%) of case. Of these cases, the total number of HAV cases was (809) followed by HBV (74) cases and the lowest number of reported cases.
was for HCV with a total number of 15 cases. The prevalence of HAV, HBV, and HCV infections regarding age of patients was shown in Figure (3).

![Figure (3) Prevalence viral hepatitis infections according to age groups of participants.](image)

This analysis depicted the relationship between types of viral hepatitis infections and age of patients and revealed a significant association at $P$-value <0.01 and the age groups of patients with viral hepatitis cases were significantly different.

During the period from 2014 to 2018, it was found that both genders had been influenced with viral hepatitis infections with preference in males of (56.1%) and in females for (43.9%). The results are shown in Table (3).

<table>
<thead>
<tr>
<th>Gender</th>
<th>Type of Hepatitis</th>
<th>Total (%)</th>
<th>DF</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HAV</td>
<td>HBV</td>
<td>HCV</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>976</td>
<td>193</td>
<td>15</td>
<td>1184</td>
</tr>
<tr>
<td>Female</td>
<td>892</td>
<td>12</td>
<td>22</td>
<td>926</td>
</tr>
<tr>
<td>Total</td>
<td>1868</td>
<td>205</td>
<td>37</td>
<td>2110</td>
</tr>
</tbody>
</table>

"$\chi^2$ obs. = Chi-squared observed, $\chi^2$ crit. = Chi-squared critical, Df= Degree of freedom, HS= High significant"

This analysis depicted the relationship between types of viral hepatitis infections and gender of patients. The results showed that HAV, HBV and HCV affected both gender significantly at $P$-value <0.01.

Discussion
Regarding Babylon province, Iraq, there was no previous studies on the prevalence of viral hepatitis infections and the present study was the first for determining the prevalence of viral hepatitis infections including (HAV, HBV and HCV) and the association with age and gender of patients in Babylon province, Iraq.

In the current study, 2110 positive cases of both sexes suffering from viral hepatitis A, B and C infections were reported during the period from 2014 to 2018. Of these cases it was discovered that the prevalence of HAV was higher than HBV and HCV with percentages of 88.5%, 9.7% and 1.8%, respectively. HAV disease occurred with more prevalence probably due to the numerous reasons including education, poor hygiene, lack of health awareness, ingestion of contaminated food or water with the virus, and socioeconomic status. These results consistent with results of a study that demonstrated the prevalence of HBsAg among Kuwaiti nationals (1.1%) and non-Kuwaiti Arabs (3.5%) [10]. On the other hand, it was found that the prevalence of HCV (1.8%) was the most minimal rate among other viral hepatitis infections. Similar results were obtained in Basra, Iraq by [11] who indicated that the prevalence of HCV cases was 0.12% among blood donors.

Depending on the country, hepatitis C infection can be concentrated in specific populations relying upon age and mode of infection, for instance, 23% of new hepatitis C infections and 33% of deaths were related to injectable drugs use. Nationally implemented responses do not include injecting drug users or prison inmates [12]. On the other hand, it was found that the highest prevalence of HAV, HBV and HCV infections was in children (42.6%) within age group (1 — 4) years.

In rural Egypt, the use of village water, contamination of drinking water sources by sewage and the utilization of dry pits are the main risk factors for transmitting HAV infection. In Libya, similar to Egypt, most HAV infections were acquired since childhood. The HAV antibodies had been detected in (60-70%) of children aged three years and in (100%) of children aged seven years [13]. HAV infection is transmitted by contamination food and water or by direct contact with an infected individual. Generally, WHO estimated that in 2016, HAV caused about 7,134 deaths globally (accounting for 0.5% of all deaths from viral hepatitis) because this virus is common among age groups under five years [14]. Unlike hepatitis B and hepatitis C, hepatitis A infection doesn't cause chronic liver illness and is rarely fatal, but it can cause symptoms of asthenia and hepatitis, which is often lethal [15].

The results in Table (3) revealed that HAV, HBV and HCV infections affected both genders significantly at P-value <0.01, with preference in males of (56.1%) and in females of (43.9%). These results were in agreement with results recorded in Misan province, Iraq, by [10] who found that HAV, HBV and HCV infection rate among males was higher than females for all years of the study period. The high prevalence of HBV and HCV infections in males when compared with females revealed that males were at significantly increased risk of having the positive HBs antigen (41%) and at increased risk of having positive anti-HCV IgG antibodies (75%) compared to females, but this association was not significant statistically [17]. However, these results were in contrast with results obtained from [18] who demonstrated that both genders were influenced with HAV and no distinctions were seen among males and females.

Ethical Clearance

The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest

The authors declare that they have no conflict of interest

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References


