

Study the epidemiological pattern of hepatitis A infections in Thi-Qar province from 2006 to 2009

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Abstract

With improvement in economic and living conditions of the communities, the age of acquiring hepatitis A virus (HAV) infection is shifting from early childhood to adolescence and young adulthood. Such epidemiological shift leads to an increased incidence of symptomatic HAV infection, including heightened risk of liver failure. The present study deals with epidemiological data for all clinically diagnosed cases of hepatitis A from 2006 to 2009. All data obtained from epidemiological unit in Primary Health Care (P.H.C) of directory of health in Thi-Qar province. A total of 415 cases of clinically diagnosed hepatitis A infection from 2006 to 2009 were reported. All cases were showing typical clinical signs of hepatitis. Out of 415, (205) 49.3 % were male and (210) 50.6 % were females. In 2006 the number of recorded cases is 139 (33.5%), in 2007 the number of recorded cases is 131 (31.57%), in 2008 the number of recorded cases is zero (0%) and in 2009 the number of recorded cases is 145 (34.93%). In concerning with gender this study reveals there is no significant differences between infection in male and female. This study revealed the number of patient cases increased in fourth age group (15-44 years) this may indicate there is significant epidemiological shift in Thi-Qar province since 2006 this could be due to sanitation and hygienic conditions are generally good and infection rates in children are generally low Iraqi peoples since 2003 had better life style than those before 2003, mothers became more educated and concern with hygiene of their children, all reasons which mentioned above decrease infection probability of smaller age groups and increase the infection probability of older age groups.

Keywords: epidemiological pattern, hepatitis, hepatitis A virus (HAV)

المخلص

أدى تحسن الأوضاع المعيشية والاقتصادية في بعض المجتمعات إلى تغيير في نمط وبائية التهاب الكبد الفيروسي نمطاً و كنتيجة لذلك حدث تغيير في الأعمار المعرضة للإصابة من الطفولة المبكرة إلى مرحلة المراهقة أو الشباب. أن هذا التحول يؤدي إلى زيادة ظهور علامات التهاب الكبد الفيروسي والتي تتضمن فشل في وظائف الكبد. أجريت هذه الدراسة بالاعتماد على البيانات المزودة من وحدة التهاب الكبد الفيروسي التابع لدائرة صحة ذي قار من 2006 إلى 2009. بينت هذه الدراسة أن مجموع الحالات المرضية من 2006 إلى 2009 هو 415 بالاعتماد على التشخيص السريري 49.3% كانت ذكور و 50.6% إناث. سجلت سنة 2006 (139) 33.5% و سنة 2007 سجلت 131 (31.57%) أما في سنة 2008 فلم تسجل أي حالة التهاب كبد فيروسي نمطاً (أ) و في سنة 2009 سجلت أعلى عدد حالات حيث بلغت 145 (34.93%). بينت هذه الدراسة عدم وجود فرق معنوي بين الذكور والإناث من حيث الإصابة بالمرض. و بالنسبة للفئات العمرية أوضحت الدراسة أن الفئة العمرية الرابعة (15-44 سنة) هي الأكثر إصابة و كما بنت هذه الدراسة أن عدد الإصابات بالمرض يزداد مع تقدم العمر في جميع سنوات الدراسة و هذا يدل على وجود حالة من التغيير الوبائي للمرض في محافظة ذي قار و يمكن أن يعود سبب ذلك إلى تحسن الظروف المعيشية و الصحية في العراق بعد سنة 2003, زيادة الوعي الصحي لدى الأمهات و تجديد شبكات نقل الماء في المحافظة كل هذه الأسباب تقلل من تعرض الأعمار الصغيرة للمرض و تزيد من فرصة اكتساب الفئات العمرية الأكبر (حيث تكون العلامات المرضية ملحوظة وخطيرة أحياناً)

Introduction

Hepatitis A is an acute, necro-inflammatory infection of the liver caused by the hepatitis A virus (HAV)^[1]. The hepatitis A virus is a small non-enveloped single-stranded RNA virus. It is thermostable and acid-resistant. The virus was thought to be an *enterovirus*. In 1991 it was classified as a member of the *Hepatovirus* genus of the family *Picornaviridae*. HAV replicates in hepatocytes and interferes with liver function, sparking an immune response that causes liver inflammation^[2]. The disease has emerged as an important public health problem in many countries of the Middle East region and Iraq is no exception^[3]. The clinical spectrum of acute disease ranges from an asymptomatic or mild anicteric illness to acute disease with jaundice to severe prolonged jaundice or fulminate hepatitis (acute liver failure)^[4]

The peak infectivity occurs during the two weeks before the onset of jaundice or elevation of liver enzyme levels when the concentration

of virus in the stool is highest. When jaundice appears, the viral concentration in the stool declines, and most patients are noninfectious after one week^[5]. The virus often passed through the faecal-oral route. Endemic areas tend to have poor general hygiene and sanitation, as well as a lower community socioeconomic status^[7]. The infection occurs during early life leading to nearly 100% prevalence of antibodies to HAV (anti-HAV) in individuals above 10 years of age^[8]. Areas of the world can be characterized as having high, intermediate and low endemicity for hepatitis A. In less developed countries with very poor sanitary and hygienic conditions, HAV infection is highly endemic and most persons become infected in early childhood. Because infection occurs at an early age when the disease is often asymptomatic, reported rates of the disease in these areas are relatively low and outbreaks are not common^[9].

Areas of high endemicity include most of Africa, Asia, Central and South America. Conditions which contribute to the propagation of the virus among young children in these areas include household crowding, poor levels of sanitation and inadequate water supplies^[9,10]. Iraq considered as highly endemic area^[11]. In communities that have intermediate rates of hepatitis A the disease occurs among children, adolescents and young adults, in contrast the communities that have high rates of hepatitis A, in which the majority of cases occur among children less than 15 years of age^[12]. With improvement in socio-economic conditions and its consequences, early childhood exposure to the virus has decreased.

Hence, there has been a gradual shift in the age of acquiring the infection from early childhood to adulthood in different parts of the world. The peak age of seroprevalence is shifting from the 1st decade of life to the 2nd and 3rd decades. This shift in age of acquiring infection from childhood to older age groups is termed as epidemiological shift [13]. Over the last 20 years, the epidemiology of (HAV) has shown a shifting pattern in most Asian and Middle Eastern countries. This study was conducted to determine the epidemiological pattern of hepatitis A infection for four years ago in Thi-Qar province, and to estimate how degree of epidemiological shifting if present.

Materials and methods

Hepatitis A is a legally notifiable infectious disease in Iraq, and the Ministry of Health is responsible for its epidemiological surveillance, investigation, research, Prevention and control.

The present study deals with epidemiological data for all clinically diagnosed cases of hepatitis A from 2006 to 2009. All data obtained from epidemiological unit in Primary Health Care (P.H.C) of directory of health in Thi-Qar province. The data

were contained the number of clinically diagnosed cases , age, gender, of all cases . Data were analyzed using descriptivestatistics, presented in terms of percentage of infection , and using the chi-square test. Statistical significance was expressed as a p-value. A critical level of $\alpha = 0.05$ was used for statistical Analysis

In this study the age groups were divided as follow : first group (less than one year) , second group (1-4 year) , third group (5-14 year) forth group (15-44 year) and fifth group (more than 45 year) . the reason of this division was to estimate the susceptibility of individual through all life stages , first age group was represent the first exposure of individual to the virus in the house , the second age group was represent the exposure of child to the virus by contact with people other than his family and from ingestion of contaminated food , the third age group was represent exposure during Adolescents stage of life were the risks of exposure increased by contact with other persons in the school , forth age group was represent Adult stage of life were the infection must be rare according to references ,and fifth age group was represent older age of individual . The data were compared for four years and analyzed statistically by using SPSS. to estimate the epidemiological changes of the disease .and to compare the percentage of the disease among years from 2006 to 2009 , the data which were collected including following information`

Gender

- 1- Residence
- 2- Level of education
- 3- Previous infection
- 4- Age

Results :

The data revealed that a total of 415 cases of clinically diagnosed hepatitis A infection from 2006 to 2009 were reported .All cases were showing typical clinical sings of hepatitis ,includes non specific prodromal symptoms with variable combinations of fever, malaise, weakness, anorexia, nausea, vomiting, arthralgias and myalgias. Prodromal symptoms tend to decrease with the onset of jaundice, although anorexia, malaise and weakness may persist or increase transiently. Jaundice lasts for several weeks . 415 cases were enrolled in this study and it is represent all cases of hepatitis A infection from 2006 to 2009 . Out of 415, (205) 49.3 % were male and (210) 50.6 % were females. In 2006 the number of recorded cases is 139 (33.5%) , in 2007 the number of recorded cases is 131 (31.57%) , in 2008 the number of recorded cases is zero (0%) and in 2009 the number of recorded cases is 145 (34.93%)

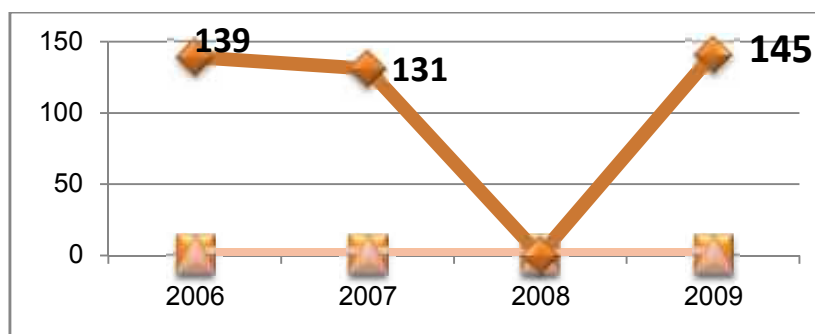


Figure (1) Number of reported cases from 2006 to 2009 according to hepatitis unit in primary health care department of Thi-Qar health directory

Table (1) overall percentage of infection among different age groups from 2006 to 2009 .

In this table the percentage of hepatitis A infection in 14-45 year category is 41.92%

group	≤1	1-4	5-14	14-45	45≤
No. of cases	2 (0.48%)	62 (14.93)	56 (13.49)	174 (41.92)	121 (29.1)

higher than other age groups followed by up than 45 year age group (29.1%) . statistically there is significant differences($p \leq 0.05$) between first age group (1-4 years) and forth age group (14-45) , also there is no significant differences ($p \geq 0.05$) between forth age group and fifth age group . Other risks factors are explained in table (2) . In this table show there is statistically differences between rural and urban population in susceptibility to the disease ($p \leq 0.05$) . In concerning with gender this study reveals there is no significant differences between infection in male and female

Table 2 show the some risks factors represented by level of education, place, previous infection

Risck factor	Number of cases	Percentage
Level of education		
High education		
Intermediate	13	3.13%
Residence		
Urban	158	38.1%
Rural	257	61.9%
Previous infection		
	12	2.8%
Yes	403	97.2%
No		

Table (3) . represent the number and percentage of infection among different age groups in 2006

Age group	1 year	1-4 year	5-14 year	15-44 yaer	45	Total
N.o of cases	0	6	21	84	28	139
Percentage	0%	4.3%	15.1%	60.4%	20.1 %	33.49%

this table show the epidemiological pattren in 2006 , this study reveals there is high percentage of infection in 15-44 year followed by 45 age . the percent 33.49% refer to percentage of infection in 2006 alone .

Table (4). Show the number and percent of infection among different age group during 2007

Age group	1 year	1-4 year	5-14 year	15-44 yaer	45	Total
N.o of cases	2	18	21	56	40	131
Percentage	1.52%	13.7%	11.45%	42.7%	30.5 %	31.5%

The table above show there is no significant different $p > 0.05$. also interesting result can be seen in this table which is the age group 1-4 year is 13.7% while in 2006 is 4.3 % , in above two tables the percentage of infection increased gradually toward the older age groups .

Table (5) . show the number of reported cases and the percent of infection during 200

Age group	1 year	1-4 year	5-14 year	15-44 year	45	Total
N.o of cases	0	38	24	38	45	145
Percentage	0%	26.2%	16.5%	26.2%	31 %	34.9%

The result of 2009 infection reveals slightly differ than other years . the age group 1-4 year record 26.2%

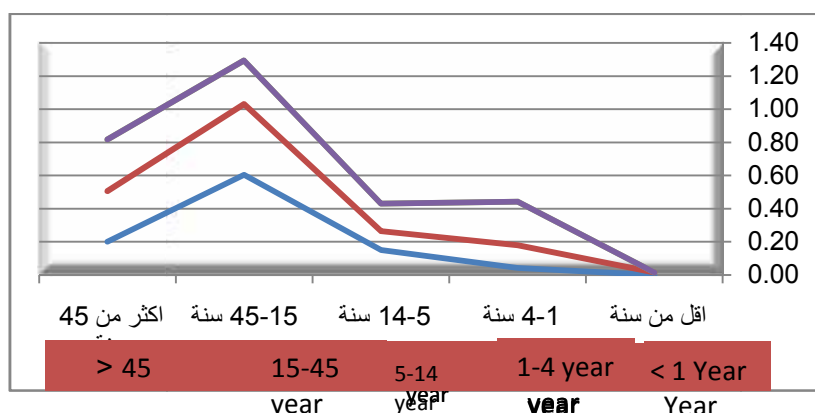


Figure (2). Show the age group susceptibility to the infection in different years

in the above figure the susceptibility increased in parallel with age group and the direction of arrows move in same rhythms and same direction ,

Discussion

Iraq is one of these endemic areas; unfortunately, there has been a gross lack of research on HAV in this country and there is no clear epidemiological study indicates the prevalence and ,which rank of endemicity Iraq is occupy .the disease is of particular concern in less developed countries because of overcrowding, poor or inadequate water supply and other problems associated with low socioeconomic status ^[11]. Age is the major factor that influences the clinical course of the primary HAV infection; it is symptomatic in only 4–16% of children compared to 75–95% of adults^[12]. In this study the prevalence hadn't used because the sampling depend only on clinically diagnosed patient which attended the hospital for liver problems , all patients were suffering hepatitis symptom and the study was design to find out is there any epidemiological changes in Thi-Qar for specific period so that is why we used the percentage of infection instead the prevalence . the disease was stable for three years 2006,2007,and 2009 while in 2008 there is no any recorded cases of hepatitis A ,in this study the susceptible age groups were 14-44 year and 45 year mean older age groups .this may indicates there is epidemiological shift occurs in Thi-Qar province since 2006 this could be due to sanitation and hygienic conditions are generally good and infection rates in children are generally low, iraqi peoples since 2003 had better life style than those before 2003

, mothers became more educated and concern with hygien of their child also the coverment rebuild new water supply network and iraq is in case of transmission from being highly endemic to intermediate or even low. Peak rates of infection and reported disease tend to be among adolescents and young adults. ^[13] . since the clinical to subclinical ratio increased with agebeside reduction in the exposure to the virus during early childhood ,one would expected a corresponding increased in proportion in clinically recognized cases , this implies that a large percent of the population remain susceptible to infection at a later age [14]. this study was agreed with ^[15]who found that more than 60% of infection occur in older age . also this result was agreed with ^[16] who found 94% of cases occur in 40year of age . The data from Qatar showed that by the age of 30 years, all individuals were anti-HAV positive although at ages 15 to 19 years, only 64% were anti- HAV positive [17]. Qatar is thus a country of intermediate endemicity for HAV infection. Many other countries show epidemiological shif like UAE, seryia, palistine, israel ,sudi arabia. In this study we found there si significant different between male and female , this could be attributed to sampling method not as we enrolled all clinically cases . The prevalence was found to be higher among older and married participants, and lower among those with higher levels of education or job training. Improvements to the sanitation infrastructure, the promotion of improved^[18] health education programs as well as enhancements to the waste disposal system are preventive strategies that can be employed to decrease the prevalence of HAV in Iraq

Conclusion

Ultimately improvements in the hygiene of food and water have caused the displacement of HAV infections from children to adult populations which has increased the mortality rate. Since 2003 iraqi peoples have improved their style of life and the economic status has improved , the percentage of uneducated people is decreased .

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