Epidemiology of Hepatitis HBV and HCV at Thi-Qar Province – Iraq.

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الخلاصة

أجريت الدراسة خلال ثلاثة أعوام 2005-2007 على 1990 مريض 1140(57.3%)ذكور و 850(42.7%)إناث في محافظة ذي قار ،ويعاني هؤلاء المرضى من أعراض وعلامات أمراض الكبد التي خلصت النتائج جميع المرضى من إصابات مرض نقص المناعة المكتسب(الايدز)وأظهرت وجود 176(8.8%)حالة موجبة لالتهاب الكبد الفيروسي ظهر التهاب الكبد الفيروسي نمط(بي)هو الأكثر شيوعا وبفارق معنوي ،اذ بلغت الإصابات 100 (5%)حالة، يتبعه التهاب الكبد الفيروسي نمط(سي) 63(3.2%)حالة وقد بلغ عدد الإصابات المزدوجة(بي+سي) 13(0.7%)حالة بزيادة معنوية في أعداد الإصابات بين الذكور بلغت 113(64.2%) حالة مقارنة مع أعدادها في الإناث، وظهرت أعلى نسبة إصابات لكل من بي وسي في المرضى من الفئة العمرية 16-30 سنة بلغت 82(46.6%)حالة ،تأتي بعدها الفئة العمرية 31-45 سنة وكانت 58(32.9%) حالة، وقد سجل انخفاض في نسبة الإصابات المزدوجة في الأعمار الصغيرة واختفائها بين أفراد الفئة العمرية 46-74 سنة وعلى أساس المهنة فقد ظهر ان أكثر الإصابات كانت بين العمال 57(32.3%)يعقبها ربات البيوت 40(22.7%)الطلاب 36(20.5%) ،الموظفون 33(18.8%) وأخيرا الأطفال10(5.7%) .

Summary

The study was conducted on 1990 patients [1140 (57.3%) males and 850 (42.7%) females] during three years 2005-2007 at Thi-Qar province. They suffering from sings and symptoms of liver diseases. The results improved no positive case of infection with HIV , and revealed 176 (8.8%) positive hepatitis cases. HBV had high prevalence than other types including 100(5%) cases with significant differences , followed by HCV 63(3.2%) and 13(0.7%)cases were recorded as dual infections (HBV+HCV). Significant increase of infections among males were recorded 113(64.2%) .High seroprevalence of HBV ,HCV and dual HBV+HCV were recorded in patients with age group 16-30 years reached to 82(46.6%), followed by the age group 31-

45 years : 58(32.9%) .Dual infections decrease in the lower age and absent in age group 46-74 . According to occupation ,the highest number of infections found among workers 57(32.3%) , followed by housewives 40(22.7%) , students 36(20.5%) , officers 33(18.8%) and children 10(5.7%) .

Introduction

Bloodborne pathogens like hepatitis B virus(HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) are considered major but preventable public health problems in the developing world[1,2]. HBV and HCV are the major causes of chronic liver disease, particularly cirrhosis and hepatocellular carcinoma[3]. Routes of transmission include unsafe injections, blood, sex contact and transmission from infected mothers to their babies[4]. The ideal public health approach to disease prevention and control is to use routine population-based surveillance data to: i) monitor the magnitude and distribution of disease; ii) identify high-risk subgroups; iii) guide national strategic plans for prevention and control; iv) evaluate intervention efforts [5,6]. Approximately 350 million people are infected with HBV worldwide , and the World Health Organization(WHO) estimates that approximately 170 million people are infected with HCV[7].
Peoples at greater risk include travelers (hepatitis is endemic in certain countries), day-care professionals, and prison inmates and workers. Hepatitis causes hundreds of millions of dollars in missed work and medical care each year.[8]
Hepatitis B virus infection is the 10^{th} leading cause of death worldwide, HBV infections result in 500 000 to 1.2 million deaths per year caused by chronic hepatitis, cirrhosis, and hepatocellular carcinoma; More efficacious treatments, mass immunization programs, and safe injection techniques are essential for eliminating HBV infection and reducing global HBV-related morbidity and mortality. Safe and effective vaccines against HBV infection have been available since 1982 [9] .Overall, 10% of people with HIV worldwide have chronic hepatitis B, but this rate is significantly greater in highly endemic areas for HBV, including Asia and sub-Saharan Africa[10] . The natural history

of chronic hepatitis B is dependent on the age of acquiring the hepatitis B infection. Those who are infected at adolescence or adulthood (including most of the Caucasians) tend to have stable disease after hepatitis B antigen seroconversion with normal serum alanine aminotransaminase (ALT) and hepatitis B virus (HBV) DNA levels $<10^5$ copies/mL (20 000 IU/mL). In contrast, those who are infected at birth or early childhood (including the majority of the world's hepatitis B carriers, i.e. Asians) have a prolonged immune tolerance phase followed by a prolonged immune clearance phase[11] .Dual infection with HBV and HCV is not uncommon in geographic areas where a high endemic level of both infections is reported, such as Southeast-Asia and Mediterranean. In general, the prevalence is around 10-20% in patients with chronic HBV infection and 2-10% of anti-HCV-positive patients to have markers of HBV infection[7,12,13].

Hepatitis B virus (HBV) belongs to the Hepadnaviridae family of animal viruses, and its genome consists of a circular partially double-stranded DNA molecule of 3.2 kb in length which contains four overlapping reading frames that code for surface proteins (HBsAg), core proteins (HBc/HBeAg), the viral polymerase, and the transcriptional transactivator X protein (HBx) [14]. Hepatitis C virus (HCV) is classified in the *Hepacivirus* genus of the Flaviviridae family, and its genome is a positive-stranded RNA of 9.6 kb in length that encodes a large polyprotein that undergoes proteolytic processing by cellular and viral proteinases to generate the individual viral proteins [15]. The aim of this study was to determine the epidemiology of hepatitis B and C and their relation with HIV in liver patients at Thi_Qar province.

Patients & Methods

Patients: The present study was conducted on 1990 outpatients at the central laboratory at Al-Nassyria city during the period from January 2005 to December 2007.The patients came from different areas of the province and suffering from signs and symptoms of liver diseases . The following data were recorded : age, sex, residence , education level , occupation and traveling out the country .

Methods: Venous blood samples were collected into sterile tubes, allowed to clot at room temperature for 30 minutes and centrifuged. Sera were separated, alliquoted and stored at – 20°C until used. Serum was tested for viral markers using commercially-available enzyme-linked immunosorbent assays(ELIZA) (BECKMAN COULTER AD 340) for hepatitis-B surface antigen (HBsAg), anti-HCV, anti-HIV (Abbott Inc., North Chicago) samples repeatedly reactive for HBsAg or anti-HCV were considered positive for HBV and HCV respectively. Data were analyzed using *SPSS*, version 10. for comparison between groups as appropriate; $P \leq 0.05$ was considered statistically significant.

Results

During three years there were 1990 outpatient [1140 (57.3%) males and 850 (42.7%) females] at Thi-Qar province ,suffering from sings and symptoms of liver diseases Investigated.The results improved no positive case infection with HIV, and revealed presence of 176 (8.8%) positive hepatitis cases ,distributed on three years 2005-2007 as following: 58 cases , 52 cases and 66 cases respectively, without significant differences($P<0.05$). Significant differences were found in type's number of hepatitis. HBV had high prevalence than other types including 100(5%) cases, followed by HCV 63(3.2%) and 13(0.7%) cases were recorded as dual infections (HBV+HCV), (table 1).

Table 1: Number of positive hepatitis from total cases for the years 2005-2007.

Year	No. of tested cases	No. of positive cases	HBV	HCV	HBV+HCV
2005	544	58	38	17	3
2006	541	52	31	17	4
2007	905	66	31	29	6
Total	1990	176 (8.8%)	100 (5%)	63 (3.2%)	13 (0.7%)

The results showed, significant increase *(P<0.05)* of infections among males (in total number and in each year alone) (table 2). From 176 positive cases, 113(64.2%) males infected with hepatitis (HBV: 65(36.9%) cases; HCV: 39(22.2%) cases; dual infections: 9(5.1%) cases). While 63 (35.7%) cases recorded in females (HBV: 35(19.8%)cases ; HCV :24(13.6%)cases ; dual infections : 4(2.3%)cases) .

Table 2:Distribution of hepatitis infections in three years 2005-2007 according to sex .

Year	Total Positive cases	Positive cases				
		sex	HBV	HCV	HBV+HCV	total
2005	58	Males	24	10	2	36 62%
		Females	14	7	1	22 37.9%
2006	52	Males	20	11	3	34 65.3%
		Females	11	6	1	18 34.6%
2007	66	Males	21	18	4	43 65.1%
		Females	10	11	2	23 34.8%
Total	176	Males	65(36.9%)	39(22.2%)	9(5.1%)	113 64.2%
		Females	35(19.8%)	24(13.6%)	4(2.3%)	63 35.7%

High seroprevalence of HBV ,HCV and dual HBV+HCV were recorded in patients with age group 16-30 year and reach to 82(46.6%) , followed by the age group 31-45 years 58(33%)

with significant differences, other groups 2-15 year 21(11.9%) and 46-74 , 15(8.5%) .Dual infections decrease in the lower age and absent in age group 46-74. (table.3).

Table 3:Distribution of hepatitis infections for three years 2005-2007 according to age group

Age Group	Total positive (N=176)	HBV (n=100)	HCV (n=63)	HBV+HCV (n=13)
2 – 15	21 (11.9%)	11 (11%)	9 (14.3%)	1 (7.7 %)
16– 30	82 (46.6%)	46 (46%)	29 (46%)	7 (53.8%)
31– 45	58 (33%)	34 (34%)	19 (30.2%)	5 (38.5%)
46– 74	15 (8.5%)	9 (9%)	6 (9.5%)	-

Data collected form patients showed: 96(54.5%) of patients from rural and 80(45.4%) from urban. According to the occupation, the highest number of infections found among workers 57(32.3%), followed by housewives 40(22.7%), students 36(20.5%), officers 33(18.8%) and children 10(5.7%). Highest percentage of infections found among illiterate level patients 48(27.3%) followed by primary level 44(25%) and the lowest percentage found in university level patients 14(7.9%).The data also revealed that 42 (23.9%)of patients traveled out of Iraq before infection for more than two months (table 4).

Table 4: Data collected from hepatitis patients

No.	Collected Data	2005/58cases	2006/52cases	2007/66cases	Total No. 176 cases
1	Resident				
	Rural	32	28	36	96 (54.5%)
	Urban	26	24	30	80 (45.4%)
2	Occupation				
	Children	2	4	4	10 (5.7%)
	Students	10	10	16	36 (20.5%)
	Housewives	15	11	14	40 (22.7%)
	Officers	11	10	12	33(18.8%)
	workers	22	17	18	57 (32.3%)
3	Educational level				
	Illiterate	18	12	18	48 (27.3%)
	Primary	14	17	13	44 (25%)
	Intermediary	10	15	17	42 (23.9%)
	Secondary	11	6	11	28 (15.9%)
	University	5	2	7	14 (7.9%)
4	Traveling				
	No	44	40	50	134(76.1 %)
	Yes	14	12	16	42(23.9%)

Discussion

The present study revealed 176(8.8%) from 1990 cases of liver patients were infected with hepatitis. These consider low percentage when comparing with the percentages of infections which reach 40% in other countries [16]. Prevalence of chronic

HBV infection over 10% from general peoples in some Asian and Western Pacific countries [17]. Egypt has one of the highest (16 – 18%) prevalence rates of HCV infection in the world [18] .In an Islamic country like Iraq, religion, culture and tradition prohibit certain risky behaviors such as extra-marital sexual activities and drug abuse may explain decrease infections with hepatitis and HIV [19].HBsAg is the oldest marker for viral hepatitis. The prevalence of HBsAg in this study was 5% of total cases. In spite of low percent of infection , this group of patients was most probably not vaccinated against hepatitis B virus; at the time of their birth, the vaccine was not included in the Expanded Program of Immunization in Iraq until last years. On the other hand, the disease acquired primarily in adulthood, whereas in Asia and most of Africa, chronic HBV infection is common and usually acquired perinatally or in childhood [9].

Percentage of infection with HCV recorded 3.2% and considered low too. HCV transmitted primarily through transfusion of blood or blood products, intravenous drug abuse and needle sharing. It is not as infectious as HBV, but up to 80% of infected individuals can become chronically infected and risk serious long-term sequel, including cirrhosis, liver failure and hepatocellular carcinoma [19]

Dual infections with HBV and HCV is not uncommon in geographic area where a high endemic level of both infections is reported [20].The present study agreement with other studies which determined prevalence of dual infections around 10-20% of HBV infections [7].Co infection of HBV and HCV is frequently found in injection drug users, patients on hemodialysis, patients undergoing organ transplantation, HIV positive individuals and beta-thalassemia patients, which mean that those are the high risk population for infection of HBV and HCV concurrently .HCV genotype and HBV genotype were found to be associated with clinical outcome in single infection in many epidemiological studies [7,21]

Although in Iraq both HCV and HBV are diseases of public health importance, no large-scale systematic epidemiological or surveillance data are available for these diseases.

The results showed a statistically significantly higher seroprevalence of hepatitis in males than females, this could possibly be a result of greater exposure to infection, e.g. through the common use of razors and and shaving at barber shops and males more traveler than females ,also genetic factors in each sex may play main role in infections[19].This results were agreement with other studies[22]

The results of this study showed high prevalence of HBV, HCV and HBV+HCV in age group 16-30 years followed by age group 31-45,this is may be refer to fact that most of them have low educational level and have had low awareness of the potential modes of transmission of infection.The results agreement with Kutrani *et al*.[22] .

Hepatitis infections were found more prevalent in rural (54.5%) than urban patients(45.5%) . A similar finding has been reported previously [19,23]

Depending on occupation, Workers have had more prevalent infection with significant differences ,may be refer to low awareness of the potential modes of transmission of infection ,and this is in agreement with previous studies [16] .Also the result showed housewives within groups which high exposure to risk of infection .This may because of housewives represent high percentage of females in Iraq and most of them illiterate and they mostly acquired infection from their husbands**.**

If educational level is taken as a proxy marker for socioeconomic status, the present study revealed high prevalence of hepatitis among the less educated suggests a higher vulnerability to infection in these group. Percentage of infections decreased in the educated groups. Similar results reported in previous studies [24, 25]

The percentage 23.9% of patients were traveled outside the country for more than 2 months. Infections may correlate with high endemic country where they traveled.

HBV is still the major cause of chronic liver disease, followed by HCV in this part of the country. Co-infection has been observed, and there is a danger of the devastating trio infecting a large proportion of cases. The prospects of a vaccine for HCV and HIV

are still remote. So, great stress must be laid on proper preventive measures such as screening of blood, safe sexual practices, proper sterilization of instruments, proper disposal of contaminated material, and immunization of people at risk particularly health care workers.

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References

- Chen DS. Public health measures to control hepatitis B virus infection in the developing countries of the Asia–Pacific region. Journal of gastroenterology and hepatology, 2000, 15(suppl.):E7–10.
- Khattak MF., Salamat N., Bhatti F.A.,Qureshi T.Z. and Pak J. Seroprevalence of hepatitis B, C and HIV in blood donors in northern Pakistan. Journal of the Pakistan Medical Association, 2002, 59:398–402.
- El-Hazmi MM. Prevalence of HBV, HCV, HIV-1,2 and HTLV-I/II infections among blood donors in a teaching hospital in the Central region of Saudi Arabia. Saudi Medical Journal, 2004, 25(1):26–33.
- Abdul Mujeeb S., Nanan D., Sabir S. , Altaf A. and Kadir M. Hepatitis B and C infection in first-time blood donors in Karachi – a possible subgroup for sentinel surveillance. Eastern Mediterranean Health Journal,2006, 12(6): 735-741.
- Chorba TL. Disease surveillance. In: Thomas JC, Weber DJ,. Epidemiologic methods for the study of infectious diseases.Oxford, Oxford University , 2001,138–162.
- Guidelines for evaluating surveillance system. Morbidity and mortality weekly report, 1998, 39:429–32, 437
- Liu Z. and Hou J. Hepatitis B virus(HBV) and Hepititis C virus (HCV) dual infection. International Journal of Medical Science, 2006,3(2):57-62.

- http://www.healthinfochannel.com/hepatitis/index.shtml
- Lavanchy D. Hepatitis B virus epidemiology, disease burden, treatment, and current and emerging prevention and control measures. Journal of Viral Hepatitis,2004, 11 (2) , 97–107 .
- Soriano V., Puoti M. and Bonacini M. Care of patients with chronic hepatitis B and HIV co infection: recommendations from an international HBV/HIV panel.AIDS, 2005, 19:221-240.
- Lai C.L. and Yuen M.F. The natural history of chronic hepatitis B . Journal of Viral Hepatitis,2007, 14 (s1) , 6–10
- Gaeta GB., Stornaiuolo G., Precone DF., Lobello S., Chiaramonte M., Stroffolini T., Colucci G. Epidemiological and clinical burden of chronic hepatitis B virus/hepatitis C virus infection. A multicenter Italian study. Journal of Hepatology , 2003, 39:1036-1041.
- Di Marco V., Lo Iacono O., Camma C., Vaccaro A., Giunta M., Martorana G. and Fuschi P. The long-term course of chronic hepatitis B. Journal of Hepatology, 1999, 30 :257-264
- Ganem D. and Varmus H.E. The molecular biology of the hepatitis B viruses. Annual Review of Biochemistry., 1987, 56:651-693.
- Rosenberg S. Recent advances in the molecular biology of hepatitis C virus. Journal of Molecular Biology, 2001, 313:451-464.
- Arora U. and Mann A. Prevalence of hepatitis B virus, hepatitis C virus, and HIV in patients of chronic liver disease in Amritsar. Journal of Indian Academy of Clinical Medicine,2007, 8(1):29-31.
- Custer B. MPH, Sullivan S. D. , Hazlet T. K. , Iloeje U. MD. M., Veenstra D. L. and Kowdley K. V. Global epidemiology of hepatitis B virus. Journal of Clinical Gastroenterology,2004 ,38(10): Supplement 3:S158-S168
- Darwish M.A. , Khalil A.H., Yassin M.M. and Awad I.F. Prevalence of hepatitis C virus and hepatitis B virus antibodies among intravenous drug addicts and the associated risk factors .Egypt Journal of Medical Laboratory Science, 2005,14 (2).

- El-Gilany A.H. and El-Fedawy S. Bloodborne infections among students voluntary blood donors in Mansoura University, Egypt . La Revue de Santé de la Méditerranée orientale, 2006, 12: (6) 742-748 .
- Fattovich G., Tagger A., Brollo L., Giustina G., Pontisso P., Realdi G.,Alberti A., and Ruol A.. Hepatitis C virus infection in chronic hepatitis B virus carriers. Journal of Infectious Diseases, 1991, 163:400–402.
- Rodrı´guez-I´n˜igo E.,Bartolome J.,Ortiz-Movilla N.,Platero C., Lo´pez-Alcorocho M.J., Pardo M.,Castillo I. and Carren˜o1 V. Hepatitis C virus (HCV) and hepatitis B virus (HBV) can coinfect the same hepatocyte in the liver of patients with chronic HCV and occult HBV infection. Journal of Virology, 2005, 79(24):15578–15581.
- Kutrani H., El-Gatit A. ,Shekhteryea A., El-Gatit Y., Al-Sodani O. And Akob S. Demographic factors influencing hepatitis B and C infection in Benghazi, Libyan Arab Jamahiriya. Eastern Mediterranean Health Journal,2007,13(1):
- El-Khanany HFM. Some epidemiological aspects of HCV antibodies among certain groups in Mansoura [thesis]. Mansoura, Egypt, Mansoura University,1996.
- Luby SP. , Qamruddin K. , Shah A.A. , Omari A. ,Pahsa O. , Khan A.J. , McCormick J.B. , Hoodbhouy F. and Fisher-Hoch S. The relationship between therapeutic injections and high prevalence of hepatitis C infection in Hafizabad, Pakistan. Journal of Epidemiology and Infection, 1997, 119:349–56.
- Khan AJ., Luby SP., Fikree F., Karim A., Obaid S. and Dellawala S., .Unsafe injections and the transmission of hepatitis B and C in a periurban community in Pakistan. Bulletin of the World Health Organization, 2000, 78:956–963.