Standard Scientific Research and Essays Vol1 (4): 68-71, May 2013
http://www.standresjournals.org/journals/SSRE

Research Article

Prevalence of hepatitis C and hepatitis B, prevention and immunization

Nawal S Faris

Department of Allied medical sciences, Zarqa University, Amman- Jordan.

Email: nawal_fares@yahoo.com

Accepted 4 May 2013

Abstract

Hepatitis B and C is a common global health problem and is spreading rapidly in developing countries due to lack of health education, poverty and illiteracy. Both of these infections can be transmitted through blood or body fluids, tattooing, through infected instruments, unsafe shave by barbers and sexual contact. Medical personnel are most exposed to these infections. There should be proper preventive measures to prevent its spread in the community. This is a descriptive study carried out on 1929 adult patients in the Department of virology at Central Laboratory of the Ministry of Health in Amman the capital of Jordan between January 2010 to December 2011 using a Bioelisa HCV 4.0 and HBs Agis an immune enzymatic. The subjects, positive for virus-related antibody, were further confirmed for viral RNA (for HCV) and DNA (for HBV) in the blood by polymerase chain reaction (PCR) amplification. The virus of PCR-confirmed HCV-individuals was further genotyped and the prevalence of HCV infection was determined with respect to age, sex, history of exposure to blood or surgical operation and different types of liver diseases. The HCV infection was found to be the predominant liver infection in the population which was 7.7 % of the positive cases, as against 10 % of HBV. Among the HCV-positive subjects (66% females, 48% males) 56% were asymptomatic. No co-incidence of HBV and HCV was found in any subject. We conclude that the viral hepatitis among the apparently healthy population of a relatively natural and pollution free environment refers to an alarming condition about liver infections, particularly of HCV, and HBV in Jordan.

Keywords: Hepatitis B infection prevention, immunization hepatitis C; HCV antibody; PCR; Jordan.

INTRODUCTION

Infection with hepatitis B and C virus (HBV and HCV, respectively) affects the liver and results in a broad spectrum of disease outcomes. An infection with HBV can spontaneously resolve and lead to protective immunity, result in a chronic infection and, in rare cases, cause acute liver failure with a high risk of dying. In contrast to HBV, an infection with HCV becomes chronic in most cases1. People with chronic hepatitis B and/or C virus infection remain infectious to others and are at risk of serious liver disease such as liver cirrhosis or hepatocellular cancer (HCC) later in life2, 3. HBV infection is widely present: approximately one third of the world's population has been exposed to the virus, and an estimated 350 million people are chronically infected4, 5. More than 500 000 people die each year of hepatitis-B-related diseases4, 6. The World Health Organization estimates that two to three percent of the world's population are infected with HCV, resulting in a total number of 120 to 170 million people7, 8 .There is a distinct geographical variation in both HBV and HCV prevalence and incidence in wild whorled

Over the past decade, the possibilities for antiviral treatment of chronic HBV and HCV infection have greatly improved, e.g. there are now six registered drug therapies for chronic HBV, and several new registrations are expected in the near future. This offers the possibility of secondary prevention of HBV- and HCV-related diseases as antiviral treatment can improve disease outcome9, 11, even though concerns regarding the effectiveness of treatment on clinical outcomes and resistance exist and combination therapy may be warranted12, 13. Evidence is accumulating that recently developed antiviral therapies may provide a cost-effective intervention to reduce morbidity and mortality in patients with HBV14-18.

However, as hepatitis B and C are largely asymptomatic, many patients who might benefit from treatment remain undetected. This raises the question whether an active effort should be undertaken to identify chronic HBV and HCV carriers so that they can be offered treatment. This would benefit patients and reduce the burden of illness and costs for the healthcare system, as costly sequelae and deaths could be prevented among a large proportion of those infected19, 20.

In addition, this may reduce transmission of HBV and HCV through a reduction of the infected pool (by curing a proportion of cases through treatment), by reducing the viral load and therefore the infectivity of chronic carriers, and by offering increased opportunities to vaccinate susceptible contacts of identified HBV carriers. The improved options for antiviral treatment now offer the possibility of successful secondary prevention of HBV and HCV. This raises the question whether there is a need to extend screening for chronic HBV and HCV infection to those population subgroups with the highest prevalence.

In order to promote national and European policies on secondary prevention of HBV and HCV, a systematic assessment of the need for HBV and HCV screening is required. This consists of at least two initial steps: an estimation of HBV and HCV prevalence (including the burden of disease in European countries), and an assessment of the effectiveness of current national screening policies. Subsequent steps include an assessment of stakeholder perceptions, and the identification of possible interventions and resource implications, together with required monitoring programmes21.

Aim of study

The aim of a study was to analyze the prevalence of the HBV and HCV in Jordan during the period 2011-2012. The possible influence of the various factors on the prevalence was analyzed too. The prevalence was compared between HBV and HCV in Jordan in these times

METHOD

From January 2010 till June 2011, a total of 1926 individuals (1215 males and 711 females) Worked HBV and HCV tests at Central Laboratory of the Ministry of Health in Amman. Tow blood samples were collected from each patient, in plain tube. Serum from the first tube was tested within two hours for ALT, AST, second tube was tested for HBV and HCV. A second-generation Enzyme- Linked Immuno-Sorbent Assay (ELISA) test system using the commercial a bioelisa HCV 4.0 is an immune enzymatic (Biokit) kit, which was used to screen all patients for antibodies to HCV and HBsAg, is an immune enzymatic method in which the wells of a microplate are coated with recombinant antigens representing epitopes of HCV: Core, NS3, NS4, and HBsAg. Serum samples are added to these wells. If antibodies specific for HCV and HBsAg were present in the sample, they will form stable complexes with the HCV antigens and HBsAg on the well. Excess sample is removed by a wash step and a rabbit anti-human IgG conjugated with peroxidase is then added and allowed to incubate. The conjugate will bind to any antigen-antibody complexes formed. After a second wash, a solution of enzyme substrate and chromogen is added. This solution will develop a blue color if the sample is positive. The blue color changes to yellow after blocking the reaction with sulfuric acid. The intensity of color is proportional to anti-HCV antibodies and HBsAg concentration in the sample. Wells containing negative samples remain colorless. Results of an assay are valid if the following criteria are accomplished:

1. Substrate blank: absorbance value must be less than or equal to 0.100.
2. Negative control: absorbance value must be less than 0.100 after subtracting the blank.
3. Low positive control: each individual absorbance value must not vary more than 30% over the mean of three replicates. The mean absorbance of low positive control must be higher than 0.200 after subtracting the blank.
4. High positive control: absorbance must be higher than or equal to 0.800 after subtracting the blank.
5. Ratio high positive control/Low positive control: must be higher than 2.5.
6. Ratio negative control/Low positive control: must be lower than 0.5.

A repeatedly positive result is indicative of HCV and HBV infection. The clinical history of the patient were taken into consideration. Data were collected from the Central Laboratory database. Positive for virus-related antibody, were further confirmed for viral RNA (for HCV) and DNA (for HBV) in the blood by polymerase chain reaction (PCR) amplification.

RESULTS

A total of 1926 patients (1215 males, 711 females) were tested for anti-HCV antibodies, a total 149 patients were gave positive results for anti-HCV antibodies, with an overall prevalence of 7.7%. The seroprevalence in males was approximately the double of that of females (66% *vs.* 48%). The most commonly caused of HCV infection was blood transfusion (68%), kidney dialysis (17%), centre for addiction (6%), and unknown cause (9%). (Table 1)

Table1. The seroprevalence of male *vs*. female and the most commonly caused of HCV infection

Months	Female Number OF Abnormal results	Male Number OF Abnormal results	Blood transfusion	Kidney dialysis	Centre for addiction	Unknown cause
January	7	15	15	1	4	2
February	2	4	3	2	0	1
March	6	14	14	3	1	2
April	3	8	7	2	0	2
May	4	8	8	3	1	0
June	7	9	10	4	1	1
July	2	6	5	2	0	1
August	2	4	4	1	0	1
September	4	7	8	2	1	0
October	7	10	10	4	1	2
November	3	5	8	0	0	0
December	3	9	9	2	0	1
Total	72	99	101	26	9	13

Table 2. Prevalence (%) of HBsAg in the patients and expatriates

HBs Antigen	No of Test	No of positive results	% of positive results
Patients	1926	210	10
Expatriates	3618	14	0.38

Table3. Prevalence of HBsAg, antibodies to hepatitis B core antigen, Anti- HBs Ag, and HBe Ag

Test name	No of Test	No of positive results	% of positive results
HBs Ag	1926	210	10
Anti-HCV	1926	149	7.7
Anti-HBC	116	74	63
Anti- HBs Ag	486	256	52.6
HBe Ag	162	25	15.4
HBe Ab	113	66	5.3

DISCUSSION

The prevalence of HBV and HCV markers of patients, in the Jordan from January 2010 till June 2011 refers to isolated high-risk groups. Thus, a published survey of HBV and HCV infection markers from a referral Central Laboratory of the Ministry of Health in Amman among patients and healthy controls, reported an HBsAg prevalence rate of 10%, an HBcAb prevalence rate of 63%, an anti-HBs Ag prevalence rate of 52.6%, and HBe Ag prevalence rate of 15.4%, an and an HBe Ab prevalence rate of 5.3%, anti-HCV prevalence rate of 7.7%, respectively (Shamliyan et al., 2008) The prevalence rates of HBV viral markers in the non- hospitalized patients are lower, come closer to the ones reported in their healthy control group. Furthermore the seroprevalence in males was approximately the double of that of females (66% *vs.* 48%). The most commonly caused of HCV infection was blood transfusion (68%), kidney dialysis (17%), centre for addiction (6%), unknown cause (9%). (Table 1)

This study will discuss the epidemiology, modes of transmission, and prevention of HBV infection. The clinical manifestations and natural history of HBV infection are discussed separately. Public health response to hepatitis B While effective national strategies for HIV and, hepatitis C have been adopted, the public health response to HBV is very limited and relies predominantly on universal infant hepatitis B vaccination. The number of people with hepatitis B is projected to increase due to continuing immigration from high endemic countries and sub-optimal vaccine coverage among high-risk populations (IDUs, MSM, Aboriginal and Torres Strait Islander peoples). To reduce the impact of hepatitis B infection, a national strategy should be developed focusing on enhanced HBV prevention, education and improvement of diagnosis, treatment and care.

The implementation of hepatitis B prevention and education is crucial to increase public awareness of hepatitis B including the risk factors for transmission, measures for prevention, and the availability of therapy. These programs should be designed

CONCLUSIONS

In the present study we investigated the prevalence rates of HBV and HCV markers in high-risk in community patients in Jordan during the period 2011. We consider important that similar studies are extended over a period of many years, since infection rates are not similar each year and a limited study period will not yield representative results. HBs Ag had an overall prevalence rate of 10% . A lower carrier rate was detected under the age of 20 years and peak carrier rates in middle age groups. HBcAb results showed an overall exposure rate to HBV virus of 63%, with the higher exposure rate. Anti-HCV had an overall prevalence rate of 10 % with significant differences between sexes (males: 99%, females: 72%), This finding Confirms the result of oriental culture, which gives freedom to the young man only .

In conclusion, we believe that, viral hepatitis markers prevalence rates of the high-risk in community patients in Jordan during the period 2011, overestimate but reflect the situation in the general population of the Jordan. Additionally these data contribute to the mapping of viral hepatitis prevalence in this geographical area of middle east and therefore may be helpful in planning public health interventional strategies.

ACKNOWLEDGMENTS

I would like to express thanks and deepest gratitude and faithfulness to Zarqa University,for supported my research and Department of virology at Central Laboratory of the Ministry of Health in Amman the capital of Jordan

References

Lauer GM, Walker BD (2001). Hepatitis C virus infection. N Engl J Med.;345:41-52.
Sorrell MF, Belongia EA, Costa J, Gareen IF, Grem JL, Inadomi JM (2009). National Institutes of Health Consensus Development Conference Statement: Management of Hepatitis B. Ann Intern Med. 150:104-10.
National Institutes of Health Consensus Development Conference Statement (2002) Management of hepatitis C:
2002--June 10-12,Hepatol.; 36:S3-20.
World Health Organization (2004). Hepatitis B vaccines. Wkly Epidemiol Rec.;79:255-263.
Lavanchy D (2004). Hepatitis B virus epidemiology, disease burden, treatment, and current and emerging prevention and control measures. J Viral Hepat 2004;11:97-107.
Goldstein ST, Zhou F, Hadler SC, Bell BP, Mast EE, Margolis HS (2005). A mathematical model to estimate globalhepatitis B disease burden and vaccination impact. Int J Epidemiol;34:1329-39.
World Health Organization. Hepatitis C - global prevalence (update). WER 1999;74:425-27.
Perz JF, Farrington LA, Pecoraro C, Hutin YJ, Armstrong GL (2004). Estimated global prevalence of hepatitis C virus infection, Boston, MA, USA.
European Association For The Study Of The Liver. EASL Clinical Practice Guidelines: Management of chronic hepatitis B. J Hepatol 2009;50:227-242.
Lok AS, McMahon BJ. Chronic hepatitis B (2007). Hepatology 2007;45:507-539.
Ghany MG, Strader DB, Thomas DL, Seeff LB (2009). Diagnosis, management, and treatment of hepatitis C: anupdate. Hepatology;49:1335-74.
Shamliyan TA, Macdonald R, Shaukat A, Taylor BC, Yuan JM, Johnson JR, et al. Antiv
Nash KL, Alexander GJ (2008). The case for combination antiviral therapy for chronic hepatitis B virus infection.
Lancet Infect Dis.;8:444-8.
Kanwal F, Gralnek IM, Martin P, Dulai GS, Farid M, Spiegel BM (2005). Treatment alternatives for chronic hepatitis
B virus infection: a cost-effectiveness analysis. Ann Intern Med.;142:821-31.
Enriquez AD, Campbell MS, Reddy KR (2007). Cost-effectiveness of suppressing hepatitis B virus DNA in immunetolerant patients to prevent hepatocellular carcinoma and cirrhosis. Aliment Pharmacol Ther.;26:383-91.
Veenstra DL, Sullivan SD, Clarke L, Iloeje UH, Tafesse E, Di Bisceglie A (2007). Cost effectiveness of entecavir versus lamivudine with adefovir salvage in HBeAg-positive chronic hepatitis B. Pharmacoeconomics;25:963-77.
Spackman DE, Veenstra DL (2008). A cost-effectiveness analysis of currently approved treatments for HBeAg positive chronic hepatitis B. Pharmacoeconomic;26:937-49.
Takeda A, Jones J, Shepherd J, Davidson P, Price A (2007). A systematic review and economic evaluation of adefovir dipivoxil and pegylated interferon-alpha-2a for the treatment of chronic hepatitis B. J Viral Hepat;14:75-88.
Toy M, Veldhuijzen IK, de Man RA, Richardus JH, Schalm SW (2009). Potential impact of long-term nucleosidetherapy on the mortality and morbidity of active chronic hepatitis B. Hepatology.
Hutton DW, Tan D, So SK, Brandeau ML (2007). Cost-effectiveness of screening and vaccinating Asian and PacificIslander adults for hepatitis B. Ann Intern Med.;147:460-9.
Oxford Handbook of Public Health Practice, (2000).