ARTICLE ORIGINAL/ORIGINAL ARTICLE

PREVALENCE OF HEPATITIS B IN A PRESUMABLY HEALTHY LEBANESE POPULATION

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Saab BR, Nassar NT, Musharrafieh U, Araj GF, Khogali M. Prevalence of hepatitis B in a presumably healthy Lebanese population. J Med Liban 2007 ; 55 (1) : 11-14.

ABSTRACT •OBJECTIVE : Policy makers need data on the prevalence of infection with HBV in order to determine the cost effectiveness of universal immunization against hepatitis B. This study aims at determining the prevalence rate of infection with HBV in a basically healthy group of Lebanese adults.

METHODS : Sera from 2634 presumably healthy Lebanese individuals, mean age 32.1 years, obtained between 1995-1997, were tested for hepatitis B surface antigen (HBsAg). The sample was composed of subjects residing in different areas in Lebanon. Detection of HBsAg was performed utilizing the ELISA technique. The analysis took place in the Clinical Microbiology Laboratory, Department of Pathology and Laboratory Medicine, American University of Beirut Medical Center, Beirut, Lebanon.

Chi-square test was used to examine statistical associations.

RESULTS : The prevalence of HBsAg among the samples was 1.6%. Blue-collar employees, smokers and those living in the South of Lebanon were significantly more likely to be infected with hepatitis B virus.

CONCLUSIONS : The data presented indicates that Lebanon has a low prevalence of HBV infection. Cost-effective studies are needed to justify universal immunization against hepatitis B especially in countries where budgets are tight.

Saab BR, Nassar NT, Musharrafieh U, Araj GF, Khogali M. Prévalence de l'hépatite B dans une population libanaise présumée saine. J Med Liban 2007 ; 55 (1) : 11-14.

RÉSUMÉ • OBJECTIF : Les professionnels de santé ont besoin de données concernant la prévalence de l'infection par l'hépatite B afin de déterminer le coût-bénéfice d'une immunisation universelle contre l'hépatite B. Cette étude vise à déterminer la prévalence de l'infection par le virus de l'hépatite B dans un groupe d'adultes libanais sains.

MÉTHODES : Du sang a été prélevé sur 2634 adultes présumés sains entre les années 1995 et 1997, et testé pour l'antigène de surface du virus de l'hépatite B (HBsAg). L'échantillon était composé de sujets résidant dans différentes régions libanaises ; leur moyenne d'âge était de 32,1 ans. La détection de l'HBsAg a été réalisée en utilisant la technique ELISA, et l'analyse effectuée dans les laboratoires de microbiologie clinique de l'Hôpital universitaire américain de Beyrouth. Le test de chi^2 a été utilisé pour examiner les associations statistiques.

RÉSULTATS : La prévalence de l'hépatite B de l'échantillon était de 1,6 %. Les employés *blue-collar*, les habitants du Liban-Sud et les fumeurs avaient significativement plus de risque d'être infectés par le virus.

CONCLUSION : Les données présentées indiquent que le Liban a une faible prévalence du virus de l'hépatite B. Des études coût-bénéfice sont nécessaires pour justifier une recommandation pour la vaccination contre l'hépatite B, surtout dans les pays à budget réduit.

INTRODUCTION

Hepatitis B virus (HBV) infection is a worldwide problem. Seventy-five percent of the world's population lives in high prevalent areas [1]. Around 350 million individuals are chronically infected with HBV [1]. These people constitute a reservoir of infection placing susceptible individuals and future generations at risk. HBV is harbored in the liver of chronic carriers who are themselves at risk of becoming one of the approximately 1 million individuals who die each year as a direct result of HBV ; namely from cirrhosis or liver cancer [2]. Infection with HBV is diagnosed when either the patient develops symptoms suggestive of hepatitis, or upon routine screening. Around 50% of those infected with HBV have no symptoms [3-6]. Ten percent of those who get HBV are infected for life and run a risk of developing serious, long-term liver disease [5-6]. Eighty percent of primary liver cancers in the world are caused by chronic HBV infection [7].

Infection is preventable through immunization and prenatal screening. Numerous field trials and controlled clinical studies have demonstrated safety, immunogenicity and prospective efficacy of the hepatitis B vaccine. From the late 1980s to 2001, the incidence of acute hepatitis B in the United States decreased from more than 300,000 to 79,000 cases per year ; resulting in a

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prevalence rate of HBsAg of 0.5% [8]. This was noted after recommending the vaccine to children, adolescents, healthcare workers and other high-risk groups. Maternal screening promises to be a cost effective approach to reduce the incidence of hepatitis B infection and disease. This benefit was even noted in areas where the frequency of HBV carriage is low [10]. In some developed countries, such as England and Wales, only 27% of pregnancies are screened for HBsAg and thus identify neonates requiring postpartum prophylaxis [11]. In the United Kingdom the hepatitis vaccine is recommended to high-risk groups and newborns who are exposed to those at a high risk to contract the HBV [12]. Some recommend routine prenatal screening to maternal HBsAg even if hepatitis B vaccine became cheap enough to vaccinate all [13].

In many developing countries, such as Lebanon, neither money nor the facilities are always available to screen pregnant women for HBsAg. The usual practice in Lebanon is to vaccinate children against hepatitis B. This happens at a time when data on prevalence rate in the community is scarce. The HBV vaccine costs around US$ 22/dose (retail price), and at least three doses are required to achieve immunity. Families usually have to pay out of their pocket to get the vaccine. In a country where more than 30% of its population lives below the poverty line, this constitutes a financial burden. Giving a priority to the vaccine may entail diverting money needed for other basic necessities to a less important, though effective, intervention.

In 1976, and 1998, an HBsAg (+) prevalence of 1.0% and 1.4% were reported among 6,100 and 11,600 blood donors at the American University of Beirut Medical Center, respectively [14-15]. Data from blood banks give a rough idea about the prevalence. There is a popular belief in Lebanon that individuals who had jaundice cannot donate blood. Reliance on such data may result in underreporting. A prevalence rate of 2.9% was reported among pregnant Lebanese women attending a tertiary care center [15].

A search of the literature did not reveal information on infection with HBV in presumably healthy Lebanese individuals who presented for a general checkup by a physician and were found to be healthy. Availability of such data would help policy makers pass recommendations regarding universal immunization with the hepatitis B vaccine.

METHODS

Study population

Between 1995-1997, all Lebanese applicants for visa to Saudi Arabia were requested to undergo a medical check-up performed exclusively by physicians of the Department of Family Medicine at the AUBMC. As part of the physical exam, a blood sample was processed for all applicants for tests for HBsAg. Applicants were randomly assigned to one of three physicians who completed the standard form of the applicant's demographic data, records of the physical examination and laboratory findings. In this study, we present findings on such applicants.

HBsAg analysis

Blood for HBsAg was tested utilizing the ELISA technique (ETI-MAK-3. Diaa Sorin s.r.l., Saluggia, Italy). Testing and interpretation of results were done at AUBMC according to the manufacturer's instructions. Quality control measures include challenges on regular basis by the College of American Pathology (CAP). A positive blood sample was retested using another ELISA technique (ORTHO, Diagnostic Systems Inc. Raritan, NJ, USA).

Statistical analysis

The Chi-square test was used to examine the significance of differences in the prevalence of HBsAg among groups, using Statistical Package for Social Sciences program, version 11.0.

RESULTS

A total of 2634 visa applicants, mean age 32.1 years (range 14-71) were tested. HBsAg results were available on 2582 (98.0%) individuals. The prevalence of positive HBsAg in this group was 1.6%. Demographic data and other characteristics of the infected individuals are presented in Table I. Of the 2634 applicants, 2083 (79.0%) were males. There was no significant difference in the rate of infection between males and females. Married sub-

TABLE I
PREVALENCE OF HBsAg
IN PRESUMABLY HEALTHY LEBANESE INDIVIDUALS
ACCORDING TO GENDER, MARITAL STATUS,
OCCUPATION, AND TOBACCO USE

	Positive HBsAg # (%)	Total # (%)	P *Value*
GENDER*			
Males	30 (1.4%)	2053 (80.9%)	*0.126*
Females	12 (2.4%)	487 (19.1%)	
MARITAL STATUS*			
Single	10 (1.1%)	880 (45.0%)	*0.497*
Ever Married	16 (1.5%)	1070 (55.0%)	
OCCUPATION**			
Blue collar	8 (1.8%)	446 (49.5%)	*0.05*
White collar	2 (0.4%)	466 (50.5%)	
SMOKING HISTORY*			
Never smoked	6 (0.8%)	790 (40.3%)	*0.043*
Ever smoked	22 (1.8%)	1170 (59.7%)	

*/**Numbers do not add to 2634 as :
- the data is not complete (*).
- there were children, adolescents, housewives, those who visited to extend their residency permit, and missing information (**).

jects were as likely as single individuals to have a positive HBsAg. Overall, 1.8% of applicants for a blue-collar job were carriers of the virus versus 0.4% of the applicants to a white-collar job (P = 0.05). Applicants who ever smoked were more likely to be infected with HBV ; this difference was statistically significant (P = 0.04).

Of the 2582 applicants, complete demographic data was available on 1623 (63%) persons. Subjects coming from the South of Lebanon had the highest infection rate (2.7%) ; this was followed by those coming from the Beqaa' region (1.2%) and Northern part of the country (1.1%) [Figure 1]. The lowest rates were recorded in individuals living in Beirut (0.9%) and Mount Lebanon (0.7%). The South had the highest infection rate. When compared to the whole sample the difference was significant (P = 0.007).

DISCUSSION

This is a sentinel study on the prevalence of HBsAg in presumably healthy Lebanese subjects coming from all areas of Lebanon. An overall prevalence rate of 1.6% is higher than the figures reported earlier from blood banks. Nabulsi et al., recently reported a 1.3% prevalence of HBsAg among 30,809 blood donors in 18 major hospitals from all parts of Lebanon [16]. We believe that the 1.6% figure is more representatives than that determined from blood donors ; as mentioned earlier, there is a belief that a person who developed jaundice cannot donate blood.

Our figure is lower than that reported from other countries in the Middle East : Jordan (5-10%), Kingdom of Saudi Arabia (7%), Iraq (4.3%), and Israel (1.9%) [17-18]. The data from Lebanon ranks in the low endemicity, which would justify the recommendation to vaccinate high-risk groups only. Such a decision is vital in a country burdened by a large debt.

The high prevalence of HBsAg in the South, Bekaa and North as compared to Mount Lebanon and Beirut may be related to the higher socioeconomic and educational levels in the latter two areas. A large number of the residents of the South of Lebanon work in Africa where HBV besides other sexually transmitted diseases are highly prevalent. The vast majority of those who live in South of Lebanon are Shiites who commemorate Ashoura. In this yearly occasion, it is a common practice (though decreased recently) to share blades used to cut several parts of the body. The South of the country also suffered heavy war activities and invasions that had its toll on hospitals and health centers. It is not unusual under such circumstances that health facilities lack essential equipment and reagents needed to test the safety of transfused blood. All the above may have contributed to the high prevalence and spread of the virus in the South.

We expected to have a higher rate of infection among males. Cultural values in Lebanon do not permit single women to indulge in sexual relations outside marriage, while it is more permissive for males. In addition, during

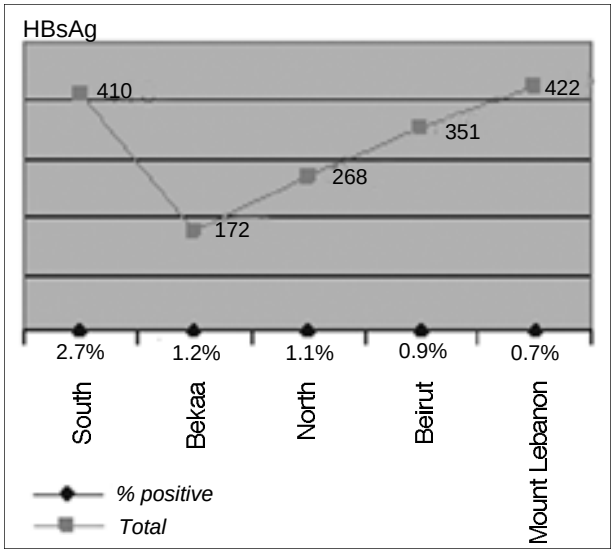

FIGURE. 1. Prevalence of HBsAg in presumably healthy Lebanese individuals according to geographic areas

the Lebanese wars (1975-1989), males were at higher risk of being injured ; hence they were more likely to receive blood transfusions. Contrary to our expectations females had higher prevalence ; however, this did not reach statistical significance.

Ever smokers (cigarettes, pipe, cigar and hubble-bubble) had a higher prevalence of positive HBsAg when compared to non-smokers. This sub-population is more likely to indulge in risky sexual behaviors [19].

The higher rate of infection among blue-collar job applicants is most probably due to the lower level of education. This in turn leads to less awareness of hepatitis B and ways to prevent it.

This study is limited by the fact that the sample consisted mainly of individuals who are able to work and their dependants. A well-designed research that surveys subjects at the community level is needed.

Another limitation is the incomplete data. Though this was a prospective study, those involved in data collection did not gather all required information. This weakens the inferences about the relation of individuals with HbsAg and the geographic area they come from and their occupation. However, this does not affect the main conclusion drawn by this research.

With the exception of the applicants coming from the South of Lebanon, the prevalence of HBV infection in Lebanon was low. Those who commemorate Ashoura need to be considered at high risk to contract HBV. Our data and others do not justify a universal policy for immunization in children and adults. In a country with limited financial resources, provision of the vaccine to high-risk groups may be sufficient. Policy makers and religious leaders need to promote educational programs, mainly in the South of Lebanon, to limit the spread of the HBV.

There is definitely a need for cost-effective studies

that take into consideration the countries' health priorities. The study helps draw the attention to the need of such studies especially in countries with tight budgets and where other health priorities might be of more importance

ACKNOWLEDGEMENT

We like to thank Dr. Souheil El-Chemaly and Zana Rouwaiheb for analyzing the data presented in this article.

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نسبة التهاب الكبد B عند اللبنانيين المعتبرين بصحة جيدة.

موجز: الموضوع – اختصاصيو الصحة بحاجة الي معطيات متعلقة بنسبة الانتان بالتهاب الكبد B لتحديد التكاليف والفوائد للتحصين العالمي ضد التهاب الكبد B غاية هذه الدراسة تحديد نسبة الانتان بفيروس التهاب الكبد B عند فئة سليمة من اللبنانيين.

الطرق – اخذت نماذج من دم ٢٦٣٤ راشداً بصحة جيدة بين عامي ١٩٩٥ و١٩٩٧ واجري لهم اختبار مولد الضد السطحي لفيروس التهاب الكبد B (مولد الضد لالتهاب الكبد B) كانت العينات الدموية من اشخاص من مناطق لبنانية مختلفة. العمر الوسطي ٣٢،١ عاما وتحقق البحث عن مولد ضد التهاب الكبد B باسعمال تقنية ELISA وتم الفحص في مختبرات الجراثيم في مستشفى الجامعة الاميركية في بيروت واستعمل الاختبار chi 2 ، وهي طريقة احصائية لفحص الاشتراكات الاحصائية.

النتائج – كانت نسبة التهاب الكبد B ١،٦٪ وكان العاملون بالياقة الزرقاء والاشخاص من جنوب لبنان والمدخنون اكثر تعرضا للانتان بالفيروس.

الخلاصة – تشير هذه المعلومات الى ان لبنان لديه نسبة ضئيلة لالتهاب الكبد B وهذه النتيجة لا تؤيد السياسة العالمية للتلقيح ضد الفيروس.