

Correlation between family history of Hepatitis B and positive HBV serologic tests in patients attending dental clinics in Riyadh

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هدف البحث هو دراسة مدى أهمية التاريخ المرضي للعائلة لمرض التهاب الكبد الوبائي لتحديد الأشخاص الإيجابيين لالتهاب الكبد الفيروسي (ب) بين المرضى المراجعين لعيادة طب الأسنان في الرياض. أجريت الدراسة على ١٢١ مراجع لعيادة كلية طب الأسنان في جامعة الملك سعود. تم جمع المعلومات من المراجعين عن التاريخ المرضي للعائلة لالتهاب الكبد الوبائي. أجريت التحاليل المصلية لجميع المرضى الذين لديهم في العائلة إصابات بالتهاب الكبد الوبائي. تم تحليل بيانات ١١٦ مريضاً وكانت نتائج الدراسة كالتالي: مدى العمر كان ٣-٦٠ سنة والمعدل كان ٣٣,٣ سنة. كان ٧٤ (٦٣,٨٪) ذكوراً و ٤٢ (٣٦,٢٪) إناثاً. الأغلبية ٦٦ (٥٦,٨٪) كانوا في العقد الثاني والثالث من العمر. ظهرت إيجابية مرض التهاب الكبد الوبائي في التاريخ الطبي العائلي في ١٠٦ من الأفراد (٩١,٤٪). بينت هذه الدراسة وجود علاقة إيجابية طفيفة بين التحليل المصلي لفيروس التهاب الكبد (ب) HBsAg مع إصابة أحد أفراد العائلة بمرض التهاب الكبد (ب). تشير نتائج هذه الدراسة إلى أن إصابة أي فرد من أفراد العائلة بالتهاب الكبد الفيروسي (ب) يحتم إجراء الأختبارات المصلية الخاصة بالمرض للتعرف على حاملي الفيروس الخامل.

The aim of this study was to investigate the importance of family history in the identification of HBV sero positive subjects. A total of 121 patients attending dental clinics were recruited for this study. Inquiry about family history of hepatitis, if any, was obtained from each subject. Subjects who reported family history of hepatitis or hepatitis-like conditions were called and sent for laboratory investigation for hepatitis markers using the ELISA technique. Data from 116 subjects with age range 3-60 years, mean 33.3 was analyzed. There were 74 (63.8%) males and 42 (36.2%) females. A great majority of subjects 66 (56.8%) were in their second and third decades. Family history of hepatitis was positive for 106 (91.4%) of the subjects. The correlation relationship of detection of HBsAg with the family history was found only marginally significant chi-square ($P=0.052$). In conclusion, a positive family history of HBV infection necessitates serologic investigation to rule out sub-clinical carrier state.

INTRODUCTION

Hepatitis B virus (HBV) infection is one of the most common viral diseases worldwide. HBV was first described in 1965.¹ It is a highly infectious agent,² capable of being transmitted sexually, perinatally, or parenterally.^{3,4}

The frequency of HBV infection and patterns of transmission vary markedly throughout the world.³ Majority of cases of HBV infection remain sub-clinical, and most cases are anicteric in nature.^{5,6} Approximately 80% of all HBV infections are undiagnosed.^{3,7} Hepatitis B virus has been identified in almost all body fluids of infected persons including blood or saliva.⁸

The carrier rate of HBsAg varies worldwide. Countries that are considered highly endemic (chronic infection rates 8% - 15%) for HBV are China, Southeast Asia, Africa, Pacific Islands, parts of Middle East, and the Amazon Basin.

Russia, Western block countries, India, Southern Europe, and South America are moderately endemic (chronic infection rates 5% - 7%). In the United States, Western Europe, New Zealand, and Australia, endemicity is low at 0.2% - 0.9%.⁹⁻¹¹

Chronic active hepatitis develops in more than 25% of carriers and often progresses to liver cirrhosis. HBV carriers have a 12 to 300 fold higher risk of developing primary liver cancer compared to the non-HBV carrier population.⁷

Hepatitis B has been recognized as an occupational health hazard for the dental profession since 1975. Mosley *et al.*¹² reported at the American Dental Association Annual Session in 1972 that dentists had a higher prevalence of anti-HBs than any other health care workers.¹³ The risk of HBV infection is a factor of exposure to the infected patient's blood.¹⁴

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Intraorally, the greatest concentration of HBV occurs at the gingival sulcus.¹⁵ Since in most patient's mouth, the sulcus is routinely inflamed, blood will mix with saliva, making it infectious with HBV. Therefore, the dental hygienist is equally at high risk like the dentist.¹² Studies primarily directed on dental profession revealed that as high as 38.5% of oral surgeons had positive serology for HBV infection.^{3,15}

Several studies ranks Saudi Arabia among the countries with high prevalence of HBV infection with a nationwide carrier prevalence that ranged from 8.3% to 10%. The prevalence reached up to 14% in some regions with an average exposure prevalence of 50%.^{4,16,17} The study of Al-Sohaibani *et al.*¹⁸ in 1995 showed that at King Khalid University Hospital in Riyadh, the prevalence of exposure to HBV among male and female medical students was 25.3% and 19.3% respectively, and among male medical staff was 42.9%.

Studies have shown that HBV can be transmitted by various parental and non-parental routes. Common factors which lead to increased HBV prevalence include contact with HBsAg carriers or patients with chronic liver disease.⁴ Traditionally, Saudis are accustomed to living under strong family bond.¹⁶

The aim of this study was to investigate the role of family history in detecting seropositive subjects among patients attending dental clinics.

MATERIALS AND METHODS

Using a questionnaire, patients who attended Oral Diagnosis Clinic at the College of Dentistry, King Saud University, Riyadh were routinely asked about history of hepatitis and/or jaundice. Subjects who indicated a history of such diseases were sent for laboratory investigation screening test to rule out carrier state prior to dental treatment. Patients with

positive response to inquiries with or without previous symptoms were referred for hepatitis B profile of HBV markers in addition to HBsAg. This profile was performed at the University Hospitals laboratory using Organon Teknikew Hapanostica HBsAg Uni-form II of Microelisa system. This system is an enzyme-linked immunosorbent assay (ELISA) for the qualitative determination of HBsAg in human serum or plasma.

A total of 121 patients were included in the study. The data was analyzed using Statistical Package for Social Sciences using (SPSS version 10). Descriptive statistics was used. The relationship between the positive family or personal history of liver disease, and present investigation with hepatitis markers was studied using the Chi-square test and Fisher exact test for small sample. Statistical significance was defined at the level of $P < 0.05$.

RESULTS

Data from 116 subjects were used for analysis. Five cases were excluded due to unrelated data (two cases were reactive to anti-HAV alone and three cases were reactive to anti-HCV alone). The demographic findings of the subjects is shown in Table 1. Age range was 3 - 60 years with a mean of 33.3 years. Male subjects constituted the majority. The highest percentage of subjects was in the second and third decades, each comprised 28.4% of the total sample. Positive response of history of hepatitis/ or jaundice on health questionnaire was indicated in 72 subjects (62.1%), although 36 subjects (31%) confirmed previously associated symptoms. Majority of the subjects (91.4%) recorded positively for family history of hepatitis.

The relationship of hepatitis markers with case history are discussed in Table 2. More than fifty percent of the subjects

Table 1. Demographic data on 116 subjects

Descriptions	n	%
Gender		
Male	74	63.8
Female	42	36.2
Age		
0 – 10	7	6
11 – 20	11	9.5
21 – 30	33	28.4
31 – 40	33	28.4
41 – 50	20	17.2
51 – 60	12	10.3
History of Liver Disease		
Yes	72	62.1
No	44	37.9
History of symptoms		
Yes	36	31.0
No	80	69.0
Family History		
Yes	106	91.4
No	10	8.6

with positive findings from case history were found reactive to HBsAg. The statistical relationship of HBsAg with family history was found marginally significant by both Chi-square and Fisher's Exact tests ($P=0.052$). The relationship with patient history was also found marginally significant by Chi-square test only. Previously associated symptoms did not show any statistically significant relationship.

Relationship of anti-HBs with case history findings indicated a statistically

Table 2. Correlation of positive HBV serology and case history

HBV marker	Case history findings					
	History of Hepatitis		Symptoms		Family history	
	n	%	n	%	n	%
HBsAg	40	55.6	19	52.8	55	51.9*
Anti – HBs	29	40.3	14	38.9	38	35.8**
HBe Ag	3	4.2	3	8.3*	4	3.8
Anti – HBc	33	45.8	14	38.9	42	39.6
Anti – HBe	21	29.2	11	30.6	33	31.1

* marginally significant ($P = 0.052$)

** statistically significant ($P = 0.006$)

significant result with family history ($P = 0.006$). Other findings did not show any significant relationship. Whereas HBeAg indicated a marginally significant relationship with previously associated symptoms by Chi-square test ($P=0.052$), no statistically significant relationship was found between anti-HBc, anti-HBe and any of the positive case history findings (Table 2).

DISCUSSION

This study was conducted in the Oral Diagnosis Clinic at the College of Dentistry in Riyadh. In this clinic the dental patients are screened for health problems and related conditions. The potential impact of the HBV carrier state to the dental professional is significant.⁷ The HBV carrier state develops more commonly by means of asymptomatic sub-clinical HBV infection, during which clear symptoms of the disease is not obvious.¹⁹ Moreover, these asymptomatic sub-clinical carriers are more likely to be HBeAg positive, being in a more infectious and contagious state and, at risk of transmitting the disease.²⁰ Therefore, it is the responsibility of the dentist to identify patients who may transmit the infection via contaminated saliva and/or blood.

The present study confirmed male preponderance,²¹⁻²⁴ indicating high exposure rate to HBV infection than females. This could be due to the fact that males in Saudi Arabia are more active socially with greater hygiene implication. This finding agrees with the results reported from other parts of the world.⁴ In this study majority of subjects were in the second and third decade which coincide with the findings of Talukder *et al.*²⁵ and Arya *et al.*²³ who described two peaks for HBV exposure in Saudi Arabia. One is in infancy and early childhood and the other is around 30 years of age. The later is reflected in the findings of this study.

Sixty-two percent of the subjects responded positively to family history of hepatitis and/ or jaundice, yet only half of those diagnosed with hepatitis was confirmed. These findings are in agreement with Hoofnagle⁵ who reported in 1980 that majority of HBV infections were sub-clinical and most cases were anicteric in nature. Jaundice, a known pathognomonic sign of hepatitis is rarely evident for diagnosis confirmation.^{5,26} Thus, approximately 80% of all HBV infections are undiagnosed. Only about 20% of patients had clinical symptoms, which subsided in two to four weeks. Therefore, patients medical histories were unreliable and insufficient in identifying exposure to HBV infection.^{21, 26}

Positive family history of hepatitis and/or jaundice was evident in more than ninety percent of the subjects in our study which included both clinical and sub-clinical cases. This was reflected when HBsAg was assayed showing marginally significant association with both family and patients' medical history. This finding demonstrated that household and sexual contacts of HBV carriers are risks for HBV infection.²⁷

The HBV marker, anti-HBs in this group revealed statistically significant association with family history ($P = 0.006$) which may indicate previous HBV-vaccination following HBV infection of a family member. The HBeAg is considered an important marker for infection in a given population. The prevalence in this study was 8.3% which was in agreement with previous report of HBeAg prevalence that didn't exceed 9%.²⁸

The positivity of HBV marker demonstrates a high exposure rate. In Saudi Arabia, it was suggested that in addition to worldwide recognized mode of transmission, folk medicine practices, the large house holds, low standards of hygiene are among factors which contributed to increased prevalence of

HBV infection.⁴

In this study, the sub-clinical cases were discovered through previous routine laboratory investigations. This was for blood donation in case of male subjects or due to pregnancy in case of female subjects. Almost all cases revealed a previous contact with a household member who was a HBV carrier. These patients are potential source of HBV infection for the dental team. Relative to occupational transmission, it is estimated that dental health care worker have a three to five times higher rate of HBV infection than the general population.²⁷

In conclusion, all clinical records for dental patients should include questions on possible family history of hepatitis and/or jaundice. Contact with a chronic HBsAg carrier may lead to a sub-clinical carrier status. Therefore, a positive family history of HBV infection necessitates serologic investigations to rule out carrier state.

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