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Original Article / *Klinik Çalışma - Araştırma*

Hepatitis B and Hepatitis C Seroprevalence in the Center of Sanliurfa Province From Southeastern Anatolia Region and Related Risk Factors

Güneydoğu Anadolu Bölgesinden Şanlıurfa İl Merkezinde Hepatit B ve Hepatit C Seroprevalansı ve İlişkili Risk Faktörleri

Süda TEKİN KORUK[1], İbrahim KORUK[2], Bensu GÜRSOY[1], Celal ÇALIŞIR[1], Fehmi YÜKSEL[3], Fadile YILDIZ ZEYREK[3], Zeynep ŞİMŞEK[2]

[1]Harran University School of Medicine, Department of [1]Infectious Diseases and Clinical Microbiology, [2]Public Health, [3]Microbiology and Clinical Microbiology,Sanliurfa

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Objective: The aim of this study was to evaluate the seroprevalence of HBV and HCV and related risk factors in Sanliurfa, a province of southeastern Anatolia.

Material and Methods: This cross-sectional study was conducted between April and May, 2008 in Sanliurfa's city center. A community-based representative sample (N=1070) was randomly selected using cluster sampling from the catchment areas served by 19 different primary healthcare centers. A questionnaire evaluating demographic information and probable risk factors for HBV and HCV was administered, and HBsAg and anti-HCV markers were analyzed from blood samples.

Results: Among the 1070 individuals who participated in the study, 33.1% were male (n=354) and 66.9% female (n=716). The average age was 35.4±13.5 (15-90) years. The seroprevalence of HBsAg positivity was 4.2% (n=45), while anti-HCV seropositivity was found to be 1.0% (n=11). Among participants who previously suffered a known hepatitis infection or who reported a family history of hepatitis, the HBsAg positivity was found to be higher ($p<0.05$). There was no statistically significant difference between HCV transmission risk factors and anti-HCV positivity.

Conclusion: This is the first hepatitis seroprevalence study in central Sanliurfa and demonstrated moderate HBV infection endemicity.

Key words: HBsAg; Anti-HCV; seroprevalence; Sanliurfa.

Amaç: Bu çalışmada Güneydoğu Anadolu Bölgesinde yer alan Şanlıurfa'da HBV ve HCV seroprevalansının ve ilişkili risk faktörlerinin saptanması amaçlandı.

Gereç ve Yöntemler: Kesitsel tipteki bu araştırma, Nisan 2008-Mayıs 2008 tarihleri arasında Şanlıurfa il merkezinde yapıldı. Küme örnekleme yöntemi ile 19 farklı sağlık ocağı bölgesinden toplumu temsil eden katılımcılar (N=1070) randomize seçildi. Katılımcılara demografik özelliklerini ve HBV ile HCV bulaşmasında risk oluşturabilecek durumları irdeleyen bir anket uygulandı ve HBsAg ve anti-HCV testleri yapıldı.

Bulgular: Araştırmaya dahil edilen 1070 kişinin %33.1'i (n=354) erkek, %66.9'u (n=716) kadın idi. Katılımcıların yaş ortalaması 35.4±13.5 (15-90) yıl idi. HBsAg seropozitifliği %4.2 (n=45), anti-HCV seropozitifliği ise %1.0 (n=11) olarak bulundu. Katılımcılardan sarılık geçirme öyküsü verenlerde ve ailede sarılık olanlarda, olmayanlara göre HBsAg pozitifliği yüksek saptandı ($p<0.05$). HCV bulaşına yönelik risk faktörlerinin anti-HCV pozitifliğine etkisi istatistiksel olarak anlamlı bulunmadı.

Sonuç: Bu çalışma, Şanlıurfa il merkezinden yapılan ilk hepatit seroprevalans çalışmasıdır ve HBV enfeksiyonu sıklığı açısından orta endemisite göstermektedir.

Anahtar sözcükler: HBsAg; Anti-HCV; seroprevalans; Şanlıurfa.

Correspondence (İletişim adresi): Dr. Süda Tekin Koruk. Harran University School of Medicine, Department of Infectious Diseases and Clinical Microbiology, Sanliurfa, Turkey. Tel: 0414 314 11 70 Fax (Faks): 0414 315 11 81 e-mail (e-posta): suda_tekinkoruk@yahoo.com

INTRODUCTION

Hepatitis B virus (HBV) and hepatitis C virus (HCV) infections remain critical public health problems around the world. HBV and HCV cause chronic viral hepatitis, cirrhosis, portal hypertension and hepatocellular cancer.[1] It is known that approximately 2 billion people in the world today have been infected with HBV, and another 210 million people have been infected with HCV.[1,2]

Both forms of hepatitis cause significant morbidity and mortality and result in great economic losses. However, their epidemiology has not been fully clarified and prevalence varies among countries and societies. Studies in various risk groups (blood donors, health care workers, hemodialysis patients, etc.) and regions have been carried out in Turkey to determine the prevalence of HBV and HCV. According to these results, hepatitis B surface antigen (HBsAg) positivity ranges from 1%-14.3% and anti-HCV positivity ranges from 0.2%-2.4%.[3] In a study of the southeastern Anatolian region, HBsAg positivity was reported to be 6.2%[4] and anti-HCV positivity 0.7%[5] in city centers. The aim of this study is to determine HBV and HCV seroprevalance and related risk factors in Sanliurfa's city center.

MATERIALS AND METHODS

Study Area

Sanliurfa province, where this study was carried out, is located in the southeastern Anatolia region of Turkey. Southeastern Anatolia is a region where the fertility rate is very high (the total fertility rate is 4.19 and the mean number of children born to women ages 15-49 years is 6.61); education level is extremely low (63.2% of women and 39.3% of men are illiterate); and both access to health care and service utilization are limited (the home delivery rate is 45.9% and the infant mortality rate is 38 per 1000 live births).[6]

According to the 2007 census records, the population of Sanliurfa's city center is 468,993, and 70% of this population is above 15 years of age.[7,8] Twenty-five percent work as migratory seasonal farmworkers, and it is expected that the number of farmworkers in this area will increase secondary to the development of the Southeastern Anatolia ("GAP") irrigation project.[9] The GAP is a water-based and human-centered development effort aimed at improving regional living standards and quality of life through an integrated and sustainable environmental project.

Sample Size Determination

This study was conducted using a community-based representative sample. First, sample size was calculated as n=811 by taking P: 0.05, ε: 0.30 using the previously-published WHO table for estimating a population proportional with specified relative precision.[10] Next, as cluster sampling was utilized, a pattern size of 1.3 was applied to the estimated sample size. Finally, 1070 participants, divided into 107 clusters of 10 people, were included in the study. The research was carried out in the catchment areas served by 19 different regional primary health care centers (PHCs). The starting point for each of the 107 clusters was selected with a random number chart from a comprehensive list of the streets in each catchment area.

Data Collection

The study was carried out between April and May of 2008. From each family, we selected one individual older than 15 years of age. After informing participants about the purpose of the study, written permission was obtained and a face-to-face survey of 20 questions was conducted.

In interview form, there were questions for determining sociodemographic characteristics, risk behaviors for transmission of hepatitis, health practices which can cause infection, seasonal farmworking status, and a history of therapeutic bloodletting, as per indigenous practices described below.

Therapeutic bloodletting: According to traditional social structures of this region, individuals with jaundice are sometimes cut along the forehead or posterior pinna for therapeutic bloodletting. Local beliefs dictate that after a brief interval, the blood loss leads to recovery from jaundice. Bloodletting is typically performed by villagers with high social-status, such as heads of familial clans or authoritative elders.

Prior hepatitis infection: This was determined by self report of symptoms consistent with jaundice, in the absence of laboratory test confirmation or known serotype. Because prior hepatitis infection was determined by self-report, we hypothesized that prior infection with any serotype (Hepatitis A virus, HBV or HCV) might be a risk factor for subsequent HBV or HCV infection secondary to the practice of therapeutic bloodletting.

Communal circumcision: This refers to circumcisions performed for large groups of young boys at one time, outside of hospitals or health care centers. Communal circumcisions may take place in private homes, large community centers or other public spaces, and carry risks such as inadequate instrumental sterilization and shared surgical supplies.

Green card: The "green card," a form of health insurance supplied to poor people by the Turkish goverment, is utilized by many families.

Migratory seasonal farmwork: Migratory seasonal farmworkers (MSFs) in this region typically reside in their permanent addresses for only 4-5 months of the year. The remainder of their time is spent migrating among 23 national provinces during harvest season-a lifestyle that bears adverse effects on healthcare access, health status, educational status and overall quality-

of-life. Because of the high prevalence of MSF and its unique social consequences, it is included as an independent variable separate from occupational status.[11]

Serologic Tests

After completing interview forms, 5cc blood samples were collected from participants' forearm peripheral veins. The samples were centrifuged at 3000 circulations for five minutes. Obtained serum was kept at -70ºC in the Harran University Faculty of Medicine (HrUFM) Microbiology Laboratory. Afterwards, all the samples were collected, HBsAg and anti-HCV were determined using Micro ELISA (AXSYM Abbott) technique. After participants determined to be HBsAg and anti-HCV positive were informed of their conditions, they were subjected to follow-up and treatment by the HrUFM Infectious Diseases and Clinical Microbiology Department.

Statistical Assessment and Analysis

Dependent variables: HBsAg and anti-HCV positivity

Independent variables: Age, gender, education level, prior hepatitis infection, family history of hepatitis, sharing razors, nail clippers or toothbrushes, history of prior blood transfusion, previous surgery, history of therapeutic bloodletting, prior tooth extractions, presence of tattooes or piercings, Communal circumcision, place (home or health care center) of last delivery (among women), and history of an elective abortion (among women). Mann-Whitney U and Chi-Squared tests were used for statistical analysis. Statistics were performed using SPSS, version 11.5.

RESULTS

Sociodemographic Characteristics

A total of 1070 participants were included in the study. 33.1% (n=354) of participants were male and 66.9% (n=716) of them were female. The average age was 35.4±13.5 (15-90) years. It was determined that 14.8% (n=158) of the participants worked as migratory seasonal farmworkers. Sociodemographic characteristics of study participants are shown in Table 1, and the risk behaviors for transmission of HBV and HCV are shown in Table 2.

Hepatitis Seroprevalence

HBsAg seropositivity was 4.2% (n=45) and anti-HCV seropositivity was 1.0% (n=11).

Bivariate Analysis Results

The distribution of HBsAg and anti-HCV status according to gender is shown in Table 2. HBsAg positivity was 4.2% in males and 4.2% in females. There was no statistically significant difference in seroprevalence by gender (p>0.05). Anti-HCV positivity was 0.8% in males and 1.1% in females and no statistically significant differences were found between the genders (p>0.05) (Table 3).

Table 1. Sociodemographic characteristics of participants in the study

	n	%
Gender		
Male	354	33.1
Female	716	66.9
Age group		
20 years and younger	121	11.3
21-40	639	59.7
41-60	251	23.5
61 years and older	59	5.5
Level of education		
Do not know Turkish	92	8.6
Illiterate	410	38.3
Primary school	364	34.0
Secondary and high school	180	16.8
University	24	2.2
Social security		
No	234	21.9
Green card	368	34.3
Social security institution	463	43.3
Private insurance	5	0.5
Occupation		
Housewife	588	55.0
Seasonal farmworkers	158	14.8
Unemployed	83	7.8
Worker	42	3.9
Tradesman	96	9.0
Clerk	29	2.7
Student	18	1.7
Driver	6	0.7
Other	50	4.4
Total	**1070**	**100.0**

Table 2. Risk behaviors for transmission of HBV and HCV

	n	%
Family history of hepatitis	261	24.4
Previous surgery	347	32.4
Prior tooth extractions	635	59.3
History of prior blood transfusion	120	11.2
Sharing razors	112	10.5
Sharing nail clippers	892	83.4
Sharing toothbrushes	107	10.0
History of therapeutic bloodletting	247	23.1
Presence of tattooes or piercings	172	16.1
Communal circumcision	227	21.2
Home delivery	207	19.3
History of an elective abortion	188	17.6

There was no significant relationship between education level and HBsAg positivity (p>0.05), but anti-HCV positivity was detected more in those whose education

was below the primary school level (p=0.001). The results are shown in Table 4.

While the average age of the HBsAg positive group was 35.1±10.8, the average age of the HBsAg negative group was 35.4±13.6 (M-W U=22203.0, p=0.67). No significant difference was found between HBsAg positivity and age.

The average age was 35.2±13.3 years in the anti-HCV negative group, and 51.8±19.7 years in the anti-HCV positive group (MW-U=2777.5, p=0.003). Anti-HCV positivity was determined to be more frequent with older age.

HBsAg positivity was determined to be 2.5% among migratory seasonal farmworkers and 4.5% among non-migratories. The difference between these two groups was not statistically significant (χ^2=0.84, p=0.35). Anti-HCV positivity was 2.5% in migratory seasonal farmworkers and 0.8% in non-migratories. While anti-HCV positivity was high in farmworkers, the difference between these two groups was not statistically significant (Fisher's Exact test p=0.065).

No significant effect was found on HBsAg and anti-HCV positivity (p>0.05) with the following transmission risk factors: previous surgery; tooth extractions; blood transfusions; sharing of razors, nail clippers or toothbrushes; presences of tattooes or piercings; communal circumcision; location of last delivery (among women); and history of elective abortions.

The prevalence of traditional bloodletting in our province was determined to be 6.5% among those who were HBsAg positive, and 1.2% among those who were anti-HCV positive. However, the difference compared to those who had not received bloodletting lacerations was not statistically significant (p>0.05).

Among the participants, HBsAg positivity was determined to be significantly higher among those who had a prior history of hepatitis (χ^2=16.6, p=0.000). Moreover, HBsAg positivity was determined to be greater among participants with a family history of hepatitis (χ^2=9.0, p=0.003) (Table 5). There were no statistically-significant differences in anti-HCV status by family history or by prior history of hepatitits (p>0.05).

DISCUSSION

The prevalence of HBV infection varies throughout the world. Accordingly, geographic regions are often classified by WHO as being of low, moderate or high endemicity.[1] The rate of HBsAg positivity ranges between 0.1-20% around the world, and between 1-14.3% in Turkey.[3] In a 2004 prevalence study of southeastern Anatolia, HBsAg positivity was found to be 8.2% in rural areas and 6.2% in urban areas. This difference was attributed to the fact that maternal-fetal transmission is higher in rural regions.[4] The rate of HBsAg seroprevalence found in this study correlates with previous population studies, revealing Turkey to be a region of moderate hepatitis B endemicity.

The prevalence of HCV in the world is around 3%. While the rate of anti-HCV positivity among blood donors in Northern Europe, Kenya and Somalia was found to be less than 1%, estimates between 1.2% and 2.2% have been reported in Pakistan, Japan and Turkey.[12] In studies of healthy blood donors from different cities in Turkey, anti-HCV seropositivity has been reported to be 0.3-1.4%.[3] These results do not, however, reflect the seroprevalence rate in the general population. Because blood donors do not reflect the general population, these studies may suffer from selection bias. In gen-

Table 3. Distribution of HBsAg and anti-HCV seropositivity according to gender

	HBsAg				Anti-HCV			
	Positive		Negative		Positive		Negative	
Gender	n	%*	n	%*	n	%*	n	%*
Male	15	4.2	339	95.8	3	0.8	351	99.2
Female	30	4.2	686	95.8	8	1.1	708	98.9
Total	45	4.2	1025	95.8	11	1.0	1059	99.0
	χ^2 =0.00		p=1.00			**p=1.00		

*Row percentage.

**Fisher's Exact Test

Table 4. Distribution of HBsAg and anti-HCV seropositivity according to level of education

	HBsAg				Anti-HCV			
	Positive		Negative		Positive		Negative	
Level of education	n	%*	n	%*	n	%*	n	%*
Lower than primary school	25	5.0	477	95.0	11	2.2	491	97.8
Primary school and over	20	3.5	548	96.5	0	0.0	568	100.0
Total	45	4.2	1025	95.8	11	1.0	1059	99.0
	χ^2=1.06, p=0.30				χ^2=10.5, p=0.001			

*Row percentage.

Table 5. Distribution of HBsAg and anti-HCV seropositivity according to prior hepatitis infection and family history of hepatitis

	HBsAg				Anti-HCV			
	Positive		Negative		Positive		Negative	
	n	%*	n	%*	n	%*	n	%*
Presence of prior hepatitis infection	16	10.8	132	89.2	4	2.7	144	97.3
Absence of prior hepatitis infection	29	3.1	893	96.9	7	0.8	915	99.2
	χ^2=16.7 p=0.000				$^{\$}$p=0.053			
Family history of hepatitis	20	7.7	241	92.3	4	1.5	257	98.5
No family history of hepatitis	25	3.1	784	96.9	7	0.9	802	99.1
	χ^2=9.13 p=0.003				$^{\$}$p=0.47			

*Row percentage

$^{\$}$Fisher's Exact Test.

eral screening studies in and around the city of Erzurum, anti-HCV positivity was reported to be 1.2%.[13] In this study, anti-HCV positivity rate was found to be similar to other studies reported from Turkey.

Although rare in Turkey, risk behaviors such as drug use, multiple sexual partners, shaving in a barbershop and travel are typically limited to men. Particularly in developing countries and regions where a traditional Islamic lifestyle prevails, sex with more than one partner is not frequent among women. Therefore, previous research has suggested that HBsAg positivity and transmission may be higher in the males.[14] However, other studies have shown that the difference between genders is not statistically significant.[15,16] Our study revealed no statistically differences in seroprevalence between genders. While hepatitis B frequency was higher among males both in both rural and urban areas in the studies carried out in the Southeastern Anatolia Region, no relation was found between the genders in terms of hepatitis C frequency. However, among different societies, nationally and internationally, gender-based differences in hepatitis seroprevalence may be observed.[4,5]

Consistent with results of previous studies in this region,[4] risk behaviors for transmission of HBV and HCV were not associated with greater seroprevalence. These results may be secondary to a truly low population prevalence of risk behaviors, or may be explained by study limitations such as self-report bias or exclusion of unrecognized risk factors. However, the consistency of these findings suggests that a lack of associaton is not secondary to study limitations, but rather a reflection of this society's lifestyle. Instead, our study revealed that familial hepatitis was among the strongest risk factors for HBV seroprevalence. Similar results were highlighted in a study carried out with blood donors in Saudi Arabia. In that study, a family history suggestive of HBV infection, lack of HBV vaccination and low education levels were significantly associated with the development of HBV infection.[17] We suggest that future research should focus on clarifying HBV risk behaviors and transmission in this region, including modes of transmission within families and households.

In this study, anti-HCV positivity was found to be higher among those who are not educated. Similar results were reported in a study by Nafeh et al.[18] Although some studies have shown no relation between education level and anti-HCV positivity, our results support the belief that education is an important social factor for protecting and improving health.

Migratory seasonal farmwork, which is widespread in the Sanliurfa province, is an important social condition that affects citywide health and education indicators. In our study, we found that seasonal farmwork does not constitute a direct risk for HBsAg and anti-HCV positivity. However, we believe that a migrant lifestyle does limit healthcare access, and suggest that large- scale studies be carried out for this group.

The transmission of hepatitis B infection also varies throughout the world. In underdeveloped nations or areas of high endemicity (such as Southeast Asia, China and Africa), the most common route of transmission is perinatal (vertical) or from one child to another (horizontal). In more developed nations with low endemicity (including North America, Western Europe and Australia), most HBV infections are acquired in early adult life through intravenous drug use, occupational exposure or unprotected sex (horizontal). However, for 20% to 30% of patients, no clear risk factors can be identified, perhaps due to a reluctance to report high-risk behavior or other unrecognized sources of infection.[19-21] Turkey is located in a moderately HBV-endemic area, and the main route of transmission is percutaneous or horizontal.[22,23] Upon examining the most important risk factors related to HBV transmission, our study found that HBsAg positivity was significantly higher among individuals with a previous hepatitis infection and among those with a family history of HBV infection.

Results and Recommendations

Hepatitis B infections in Sanliurfa province are moderately endemic.

Anti-HCV positivity is more frequent with older age.

Anti-HCV positivity is higher in those who are under-educated.

Health education studies for prevention of familial horizontal transmission of HBV are important.

Studies and campaigns raising awareness of HBV and the importance of vaccination should be carried out.

Conflict of Interest

No conflict of interest declared by the authors.

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