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AN ENEMY NEARBY ME: OCCUPATINAL HEPATITIS B RISK FOR PHYSICIANS

ABSTRACT

This study is conducted to determine the prevalence of occupational risk of Hepatitis B virus among the physicians in a training hospital setting, to assess their attitudes towards the exposure to blood and body fluids, and appraise the physician compliance with universal precautions. Ninety three (72.1%) residents and 36 (27.9%) attending physicians included in the study. The mean year of practice was 5.74±5.86. The majority of physicians (88.4%) reported that they had exposure to blood or body fluids at least once during their professional years. The exposure was significantly higher in surgical branches than internal medicine branches ($p<0.05$). Vaccination rate was determined to be 85.3%. Vaccination rates and HBV infection status were not statistically significant ($p>0.05$). The majority of participants (89.9%) reported that they were wearing gloves during work. Despite the exposure to blood and body fluids is prevalent in physicians, reporting exposures and consistency with universal precautions are less then desirable.

Keywords: Hepatitis B, Occupational Exposure, Doctor, Infection, Vaccination

YANIMDAKİ DÜŞMAN! DOKTORLAR İÇİN MESLEKİ RİSK: HEPATİT B

ÖZET

Bu çalışmanın amacı doktorlarda mesleksel risk olan Hepatit B enfeksiyonu sıklığını, doktorların kan ve vücut sıvılarıyla temasa karşı tutumlarını, evrensel korunma yöntemlerine uyumlarını ve HBV'ye karşı aşılanma durumlarını belirlemektir. Çalışmada yaşları 25-51 arasında olan (ortalama=30,31±5,62 yıl) 93 asistan (%72,1) ve 36 uzman (%27,9) vardır. Ortalama mesleki deneyim 5,74±5,86 (1-27) yıldır. Çalışma grubunun çoğunluğu (n=114, %88,4) meslek yaşamları boyunca iş sırasında en az bir kez kan ve vücut sıvıları ile temas ettiklerini bildirmiştir. Cerrahi branşlarda temas dahili branşlardan anlamlı olarak yüksek olmasına karşın($p<0.05$), aşılanma durumları ve HBV enfeksiyonu geçirme açısından iki grup arasında anlamlı fark yoktur($p>0.05$). Katılımcıların büyük çoğunluğu (n=116, %89,9) çalışırken eldiven giydiğini bildirmiştir. Çalışma grubunun aşılanma oranı ise %85,3(n=110) olarak belirlenmiştir. Sağlık çalışanlarında kan ve vücut sıvılarıyla teması sık olmasına rağmen bunların rapor edilmesi ve evrensel önlemlere uyum düzeyi hala düşüktür.

Anahtar Kelimeler: Hepatit B, Mesleksel Risk, Doktor, Enfeksiyon, Aşı

1. INTRODUCTION (GİRİŞ)

Hepatitis B virus (HBV) infection is a serious occupational health hazard in the health care area and HBV infection is a model for the transmission of blood-borne pathogens [1 and 11]. Due to frequent contact with blood products, health care workers (HCW) represent one of the higher risk groups [2, 3, 5, 6, 9 and 13]. The contagiousness of the Hepatitis B virus depends on its ability to survive the external environment for months under appropriate conditions [2]. A decline in the prevalence of hepatitis B infection worldwide calls for the changes in attitudes, high-risk behavior and the wider use of vaccination [14].

The prevalence of HBV markers in HCWs is not uniform in all countries, and it generally correlates with the prevalence of infection in the general population, the high frequency of exposure to blood and other body fluids and the high contagiousness of hepatitis B virus [2, 5, 6, 8 and 12].

Turkey is an intermediate endemic area for HBV infection and HCWs in Turkey are at high risk for getting hepatitis B. The prevalence of Hepatitis B surface antigen (HBsAg) is 6.8% and Hepatitis B surface antibody(anti-HBs) are 29.7% in general population with some differences according to age groups and location [15]. Among HCWs the average prevalence of HBsAg is 8% (3.5%-16.4%) and the average prevalence of anti-HBs is 40% (17.9%-52.9%) based on a variety of studies [16]. The epidemiology of occupational exposure incidents to blood and body fluids, HBV infection and the management of prophylaxis in HCWs were reported from different hospitals in Turkey [4, 13, 16 and 19].

Vaccination is an important component of blood borne pathogen exposure prevention programs [20]. Any direct contact (i.e., contact without barrier protection) to concentrated virus in a research laboratory or production facility is considered an exposure that requires clinical evaluation [21]. The risk of HBV infection is primarily related to the degree of contact with blood in the work place and also to the hepatitis B e-antigen (HBeAg) status of the source person. In studies of HCWs who sustained injuries from needles contaminated with blood containing HBV, the risk of developing clinical hepatitis was 22%–31% if the blood was both hepatitis B surface antigen (HBsAg) - and HBeAg-positive and the risk of developing serologic evidence of HBV infection was 37%–62% [21]. However, despite regulations and special policies, low rates of reported injuries and exposures are still a great concern [22]. Protecting the patient from the infected HCW is as important goal as protecting HCWs and this mainly depends on protecting HCWs from infection by vaccination or restricting infected HCWs to perform high-risk procedures that would likely to transmit the virus [8].

2. RESEARCH SIGNIFICANCE (ÇALIŞMANIN ÖNEMİ)

By determining the current frequency of Hepatitis B exposure, reporting habits and hepatitis B vaccination status in physicians, in a busy hospital setting in Turkey, we tried to draw awareness to HBV infection and shed light on the current frequency of exposure to HBV infection, a serious occupational health hazard [1 and 11].

3. MATERIAL-METHODS (MATERYAL-METOT)

This descriptive and cross-sectional study was conducted in Ankara Training and Research Hospital of Health Ministry in a stated week in 2006. This tertiary hospital has approximately 500 beds and was located in Ankara, in the capital city of Turkey. A 25% non-systematic random sample of 630 physicians were selected among

residents and attending physicians. All physicians who were at night shift on the stated week were invited to participate to the study. A self -administered questionnaire with questions of age, gender, branch, and length of career, prior hepatitis B infection, blood or body fluid exposure, and way of exposure, exposure time, attitudes after exposure, HBV vaccination and compliance with universal precautions was distributed to physicians after obtaining informed consent. Blood exposure separated into either percutaneous (e.g. needle stick or cut) or mucocutaneous (e.g. eye splash) exposures. A family physician assistant distributed and collected the questionnaires.

Institutional review board approval for the study was granted by the Ankara Training and Research Hospital of Health Ministry Ethics Committee. Permission for carrying out the study was granted by the institution Involved and informed consent was obtained from all participants. Data were analyzed by SPSS version 10. Descriptive statistics and chi-square were carried out. The level of significance was 95%.

4. FINDINGS AND DISCUSSIONS (BULGULAR VE TARTIŞMALAR)

Out of the total 630 physicians, 25% (158/630) were contacted of whom 100% consented to participate. Twenty nine participants were excluded due to missing questionnaire data, leaving 129 (81.6%) physicians eligible for analysis. Most of the HCWs were (n=93, 72.1%) resident physicians and the others were (n=36, 27.9%) attending physicians in different specialties, between the ages of 25-51(mean=30.31±5.62) years. Seventy six (58.9%) were male and 53 (41.1%) were female. The mean length of career was 5.74±5.86 (range=1-27) years. The socio-demographic features of the physicians are summarized in Table 1.

One hundred and fourteen physicians (88.4%) reported that they were exposed to injuries at least once during their tenure. The most frequent way of exposure was needle stick injuries (n=101, 78.3%). More than a half of the doctors noted that they did not report the exposure (n=67, 58.8%). Workload was the most denoted reason (n=34, 29.8%). In Table 2, the ways of exposure, attitude after exposure and the reasons for not reporting are presented.

While 114(88.4%) participants were taking measurements during work, 116 participants (89.9%) reported that they were wearing gloves during work regularly as a protective measure. There was no statistical significance among the specialties, career and gender ($p>0.05$). Wearing protective glasses were significantly higher in surgical branches and females ($p<0.05$). Knowledge of Hepatitis B serology and consistency of the doctors to the universal precautions demonstrated in Table 3.

Overall vaccination rate was 85.3% (n=110) among the physicians. Although exposure was significantly higher in surgical specialties compared to medical specialties ($p<0.05$), vaccination rates and infection status were not statistically significant ($p>0.05$). There was a statistical difference in vaccination rates between gender in favor of females and in career to the disadvantage of attending physician ($p<0.05$). None of them mentioned that they were HBsAg positive.

Recent studies examined the occupational HBV infection risks in HCWs. Most of the published studies incorporated the whole spectra of the HCWs, including physicians, nurses, and laboratory technicians and cleaning staff etc. [4, 8, 10, 12, 13, 17, 19, 20 and 23]. In our study, the target population constituted of physicians who were one of the most risky groups among HCWs. Similarly, in an epidemiological

study in a university hospital in South Korea, physicians and new employees were the major exposed groups [3]. Manso et al. [11] reported that physician and nursing staff had a higher risk of exposure. Oh et al.[3] reported the crude incidence density of physicians and registered nurses as 4.34% and 3.15%, respectively. Research on resident and attending physicians is noteworthy because they perform injections, sampling blood, inserting IV catheters and assisting operations in services and emergency department. We believe that study sampling represented the major risk group of the study hospital because of their working conditions. Besides this, according to a study while 93% clinical staff reported occupational contact with blood or body fluids, 15.3% non-clinical staff experienced at least 1 needle stick during their careers [20]. In fact, it is also interesting to investigate attitudes of a top educated group of HCWs whom accepted to know and to show the correct manners as the study of Stein et al. denoted [7].

It can be concluded from the research findings that exposures were common among physicians (88.4%). Similarly, some previous studies have suggested that exposures were common in HCWs [3, 5, 10, 11, 13 and 23]. In a study, in Brazil in intensive care department personnel, 48% HCW reported occupational exposure to blood and other body fluids [11]. Kermode et al. [5] noted that 73% of HCWs reported at least one percutaneous injury over their working lifetime in rural north India. This is also similar to the conclusions of a study in South Korea which mentioned that exposure rate was 84.5% in HCWs and total crude incidence density was 2.62 cases per 100 person-years during the 10 year study period [3]. Again in another study by Talaat et al. [10] in Egypt, 35.6% of HCWs were exposed to at least 1 needle stick injury during the past 3 months with an estimated annual number of 4.9 needle sticks per worker. Seemingly, 88.4% exposure rate in our study population was higher than those studies although they were not consisting of only physicians. This may reflect the indifference, and negligence of participated physicians. In Turkey, exposure rate was noted as 71.0% to 78.3% in HCWs and were significantly higher in surgical branches (77.4%) which are similar to our findings [13 and 23].

Occupational exposures that may result in HBV transmission include percutaneous injury (e.g. needle stick) and contact of mucous membrane (e.g. splashes on eyes, skin lesions) or non-intact skin (e.g. cutaneous scratches, skin lesions) with blood, other body fluids or both [21]. Besides percutaneous and permucosal exposures mostly seen occupational exposures were needle stick injuries [3, 5, 6, 12, 13 and 20]. In some previous studies, nearly nine in ten HCWs reported percutaneous exposure with mostly needles [3 and 6]. Eleven percent mucocutaneous exposure and 30% percutaneous exposure in a preceding week, which was noted in rural north Indian health care settings, were both an alarming and perplexing finding [5]. Of special concern is the fact that, within a 6-month period, nearly 7% of non-clinical correctional health care workers (CHCWs) had at least 1 potentially serious exposure to blood [20]. The total number of contamination exposures per HCW per year was 0.6 in HCWs surveyed [6]. Although, in the present study, the lack of not classifying the time of exposure tends to favor forgetting the exposures, 88.6% HCWs pointed out needle stick injuries. Other percutaneous exposures and permucosal exposures were 33.3% and 44.7%, respectively. In terms of exposure with sharp and needle stick injury in physicians, our findings are twice much more than another study performed in Turkey, reporting this rate as 42.4% [13]. It was also higher than the results of Fisker et al. [12] who reported this rate as 52% in HCWs.

Oh et al. [3] noted that exposures mostly happened in inpatient wards (51.1%), operating rooms (15.1%) and emergency centre (10.1%) during blood sampling (22.8%). They also mentioned that operation; recapping and starting IV catheter was 10.6%, 16.4% and 13.4%, respectively [3]. Among HCWs who reported a needle stick injury during the previous three months, more than 40% reported manipulation of the needle after an injection [10]. Most of the exposures in surgical branches were during operation [23]. In this study, both resident physicians and attending physicians were making all the risky manipulations (blood sampling, IV catheterization, operation etc.) and operating rooms were the most common place of exposures (61.4%). Approximately one fourth (22.5%) of exposures were at the time of blood sampling.

The results of recent studies generally support that the high frequency of percutaneous exposure and low reporting efficacy is worrisome [7, 12 and 20]. In Taiwan, exposures as assessed by a questionnaire were more frequent, with a reported incidence of needle stick and other sharp injuries of 1.30 and 1.20 per person per year, respectively [6]. This may reflect the reality that HCWs were reporting only serious exposures. The reasons for non-reporting were the negligence of implicated risk of (51%); and the troublesome or time consuming reporting procedures (24%) [12]. More than 29% of the obstacles to reporting are a perception of lack of time or a lack of knowledge about the reporting mechanism [22]. Erbay et al. [23] reported that sixty eight percent of exposures were not reported and the main cause for not reporting exposure was discounting in 33.2%. As in prior researches, 51.9% of the participants did not report the exposures and workload was the main reason of non-reporting (24.6%). It was confusing that 10.5% of the physicians did not find the exposure important.

In Turkey, the prevalence of HBsAg is 6.8% and anti-HBs is 29.7% in normal population with some differences according to study population and cities. The prevalence of HBsAg and anti-HBs in health care workers were reported as 4.8% and 34.4% (except vaccinated ones), respectively [15]. In this study, none of the participants mentioned that they were HBsAg positive but Anti-Hbc total was positive in six (4.7%) of them and Anti-HBs (including vaccinated ones) was positive in 96 (74.4%) physicians. It shows that approximately five percent of HCWs encountered HBV infection and became immune in natural ways. Already, 3.1% physicians noted that they had HBV infection before. Shin et al. [9] noted that 26.4% of HCWs were Anti-Hbc positive and vaccination history was positive in 74.1% of HCWs in their study in Korea. As it was reported in previous studies, average HBsAg positiveness was 8% (3.5%-16.4%) and average Anti-HBs positiveness was 40% (17.9%-52.9%) in HCWs in Turkey and HCWs constitutes the major risk group for HBV infection [16]. In another study, Anti-Hbs positiveness in unvaccinated and vaccinated groups was founded as 14.2% and 56.7%, respectively [19]. As may be seen, encounter to HBV virus rates were lower than thoses of found by Irıs et al. [17] who reported anti-Hbc total as 5.45% in their study.

Differences in study design, as taking blood samples of participants against self reporting and free hepatitis B vaccines for risky groups by government (for all newborns since 1998) could be contributing factors in such a difference. Our results were also similar to a study in Korea which noted HBsAg and Anti-HBs positiveness in HCWs as 2.4% and 76.9%, respectively [9].

HCW are at increased risk of infection with HBV but HBV infection is a vaccine preventable disease [11 ve 21]. Previous researches suggested that vaccination coverage of HCWs were chancing

in between 64.2% to 95.5% [5, 11, 20]. We found vaccination rate as 85.3% (n=110) and exposure rate as 88.4% (n=114) in our study population. In terms of vaccination coverage, our results are similar to them. By the way, our results were higher than the study which reported that only 15.8% of HCWs vaccinated for HBV [10]. To the benefit of high risk in HCWs, similarly, Iris et al. [17] reported that none of the HCWs who exposed to HBV was immunized with HBV vaccine before. Besides these, HBsAg was positive in 5.94% of their study population. According to the data of 16 European countries the seroprevalence of practicing HBsAg positive HCWs in some countries can be high, ranging from 0.3% to 3%. Evidence of past infections is significantly higher, ranging from 4% to 30%. Consequently HBV infected HCWs may still pose a significant risk to patients [8].

It is important to follow standard precautions with any patient during interactions when there is potential risk for blood exposure. It is an approach that does not require knowledge of the patient's blood-borne infection status [24]. Compliance with hand hygiene recommendations is poor worldwide. It is now recognized that improving compliance with hand hygiene depends on altering human behavior. Improving hand hygiene remains a challenge for infection control practitioners in health care institutions [25]. However, there are significant differences in the number and types of prevention policies implemented by different countries. The core elements are hand disinfection after contact with patients, use of barrier precautions (gloves), minimal manipulation and safe disposal of sharp instruments [8]. In a study, Gershon et al. [20] reported use of gloves and eye glasses as 87.1% and 45.0% in HCWs, respectively. Conversely, the majority (71%) of physicians reported they did not regularly wear gloves when taking blood although 83% believed it was very important. Despite most physicians claiming that it is necessary to wash hands after patient contact, only seven out of every 10 reported doing so frequently in practice [7]. In the present study, 89.9% of the participants were wearing gloves but only 76.7% of them were wearing it in every patient examination regularly. Approximately, one fourth (23.3%) of the study group were wearing gloves in only special situations and special patients as they said. While 88.4% of the physicians were taking measurements during work, there was a significant difference between surgical branches and internal branches in favor of internal branches for not taking measurement regularly ($p<0.05$).

There are a number of limitations in this study, which should be noted. First of all, it was depending on a self-reporting questionnaire which may not reflect reality. Second, retrospective reporting of occupational exposures is subject to recall bias. Third, it was not possible to identify characteristics of the HCWs who failed to complete the questionnaire. And of course the study group may not be the representative of all HCWs in Turkey.

5. CONCLUSION AND SUGGESTIONS (SONUÇ VE ÖNERİLER)

This study shows that exposure to blood and hazardous body fluids are still prevalent among HCWs leading to higher risk of HBV infection. However, results marked that there was an imperfect manner in taking precautions and in reporting exposures. The core elements of universal precautions are hand disinfection after contact with patients, use of barrier precautions (gloves), and consistency with universal precautions were missing during work time. In our opinion all physicians should be vaccinated against hepatitis B in their preclinical years of education and should know their response to the vaccine. Education and training in infection control should start at

the earliest opportunity. Counseling about the management and follow up of occupational blood and body fluid exposures are also essential topics.

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Table 1. Socio-demographic characteristics of participants.
(Tablo 1. Çalışmaya katılanların sosyo-demografik özellikleri)

Characteristics	Number of participants	Percentage (%)
Age		
24-30 year	92	71.3
31-40 year	27	20.9
≥41 year	10	7.8
Gender		
Male	76	58.9
Female	53	41.1
Career		
Resident hospital doctor	93	72.1
Specialist	36	27.9
Branches		
Surgical branches	78	60.5
Internal branches	51	39.5
Practice Years		
1-5 year	88	68.2
6-10 year	22	17.1
≥11 year	19	14.8

Table 2. The ways of exposure, attitudes after exposure and reasons for not reporting
(Tablo 2. Temas yolları, temas sonrası tutum ve olayı rapor etmeme nedenleri)

Exposure Way	Surgical branches		Internal branches		P	Total number	Percentage (%)
	N	%	N	%		N	
Needle stick	73	64.0	28	24.6	0.001	101	88.6
Skin	38	3.3	17	14.9	0.692	55	48.2
Mucosa	51	44.7	23	20.2	0.536	74	64.9
Exposure Time							
Blood sampling	29	22.5	30	23.3	0.000	59	45.7
Intravenous venture	15	13.2	18	15.8	0.004	33	28.9
During operation	70	61.4	3	2.6	0.000	73	64.0
Injection	11	9.6	9	7.9	0.296	20	17.5
Medical waste	11	9.6	7	6.1	0.595	18	15.8
Other	9	7.9	7	6.1	0.395	16	14.0
Reporting After Exposure							
Infection committee	22	19.3	13	11.4	0.667	35	30.7
Head of the service	2	1.8	4	3.5	0.094	6	5.3
Colleague	5	4.4	9	7.9	0.014	14	12.3
Reason for not reporting							
Of no importance	12	10.5	6	5.3	1.000	18	15.8
Workload	28	24.6	6	5.3	0.029	34	29.8
Being vaccinated	19	16.7	12	10.5	0.506	31	27.2
Other	8	7.0	3	2.6	0.749	11	9.6

Table 3. Knowledge of Hepatitis B serology and consistency of the physicians to the universal precautions
(Tablo 3. Hekimlerin Hepatit B serolojilerini bilme ve evrensel korunma yöntemlerine uyma durumları)

Knowledge of HBV Serology	Surgical branches N	%	Internal branches N	%	p	Total number	Percentage (%)
Knowing	62	48.1	42	32.6	0.821	104	80.6
Vaccinated	64	49.6	46	35.7	0.309	110	85.3
Prior HBV infection	3	2.3	1	0.8	1.000	4	3.1
Precautions							
Yes	73	56.6	41	31.8	0.027	114	88.4
Type of precautions							
Glove	73	56.6	43	33.3	0.133	116	89.9
Eye glasses	30	23.3	2	1.6	0.000	32	24.8
Other	2	1.6	2	1.6	0.648	4	3.1
In every patient	59	50.9	30	25.9	0.182	89	76.7
In special patients	14	12.1	13	11.2	0.182	27	23.3