



Investigation of Hepatitis Serology and Occupational Exposure Risk to Viral Hepatitis in Hospital Housekeeping Staff

Hastane Temizlik Çalışanlarının Hepatit Serolojileri ve Mesleki Viral Hepatit Temas Risklerinin Araştırılması

Semiha SOLAK GRASSIE¹, Sümeyra ÇETİN GEVREK²

¹Yıldırım Beyazıt University Yenimahalle Training and Research Hospital, Department of Infectious Disease and Clinical Microbiology, Ankara, Turkey

²Yıldırım Beyazıt University Yenimahalle Training and Research Hospital, Infection Control Unit, Ankara, Turkey

ABSTRACT

Objective: Viral hepatitis is still an important health problem in our country. Healthcare workers (HCWs) are at a higher risk for acquiring viral hepatitis. Hospital housekeeping staff, working in similar conditions with HCWs, are a very difficult group in terms of training and follow up. In this study, it was aimed, It was aimed to investigate the serological status and occupational exposure risk of our hospital housekeeping staff to viral hepatitis.

Materials and Methods: A pre-prepared questionnaire was completed for each cleaning staff member working at the hospital through one-on-one interviews. The data regarding education level, job experience, attendance to previous training programs and vaccination status were collected in this questionnaire and for each staff one questionnaire form was filled. Serological tests for hepatitis A, B, and C were done.

Results: The hepatitis B surface antigen (HBsAg) positivity rate among our hospital housekeeping staff was 4.9%, and 8.9% of them tested negative for anti-hepatitis A virus (HAV) IgG. Anti-hepatitis C virus (HCV) positivity was 0%. 48.1% of the staff had completed primary school. 61.7% of the staff reported that they did not receive any training on the methods of protecting against blood-borne pathogens. 81.5% of them did not have any experience of working in a healthcare setting and only 8.6% of them have been previously vaccinated against hepatitis B.

Conclusion: HBsAg seropositivity rate in housekeeping staff in our sample was higher than in the normal population and was similar to that in other HCWs. Their anti-HAV IgG and Anti-HCV positivity rates were similar to that in the normal population. It was determined that the group had a low education level and did not have any experience of working in a healthcare setting and their hepatitis B virus immunization rate was low (8.6%). We concluded that annual health check, vaccination and frequency of training programs are not sufficient for hospital housekeeping staff and we suggest that serology testing, vaccination of seronegative personnel and training related to blood and body fluid exposure risks, and protection methods should be performed at the time of job start.

Keywords: Occupational risk, hepatitis A, hepatitis B, hepatitis C, seroprevalence

ÖZ

Amaç: Viral hepatitler ülkemizde halen önemini koruyan bir sağlık sorunudur. Sağlık çalışanları viral hepatitler açısından riskli grupta bulunmaktadır. Hastanede çalışan temizlik çalışanları sağlık çalışanları ile benzer koşullarda çalışmakta olup, eğitimleri ve takipleri oldukça zor olan bir gruptur. Bu çalışmada hastanemizde çalışan temizlik elemanlarının bu konudaki riskleri ve hepatit serolojilerinin araştırılması amaçlanmıştır.

Gereç ve Yöntemler: Hastanemizde çalışmakta olan temizlik görevlileri ile yüz yüze hazırlanmış olan anket formu dolduruldu. Bu ankette temizlik çalışanlarına eğitim durumları, deneyimleri, aldığı eğitimler soruldu ve her temizlik çalışanı için bir form dolduruldu. Hepatit A, B ve C serolojileri çalışıldı.

Bulgular: Temizlik elemanlarında hepatit B'nin yüzey antijeni (HBsAg) pozitiflik oranı %4,9, anti-hepatit A virüsü (HAV) IgG negatiflik oranı %8,9 ve anti-hepatit C virüsü (HCV) pozitiflik oranı %0 olarak tespit edildi. Çalışanların %48,1'inin ilkökul mezunu olduğu, %61,7'sinin kan ve vücut sıvılarıyla bulaşan patojenlere karşı korunma ile ilgili eğitim almadığı, %81,5'inin daha önce bu iş kolunda deneyimi olmadığı ve sadece %8,6'sının işe başlamadan önce hepatit B aşısı yaptırdığı tespit edildi.

Sonuç: Çalışmamızda temizlik elemanlarında hepatit A ve anti-HCV pozitiflik oranlarının topluma benzer, HBsAg pozitiflik oranının ise toplumdaki yüksek ve diğer sağlık çalışanları ile benzer oranlarda olduğu saptandı. Bu grubun eğitim düzeyinin çok düşük olduğu ve daha önce hastanede çalışma konusunda deneyimleri olmadığı, hepatit B aşılama oranlarının çok düşük (%8,6) olduğu tespit edildi. Hastane temizlik çalışanları için uygulanan yıllık sağlık kontrolü ve eğitimlerin sıklığının yetersiz olduğu ve bu personelin işe başlarken hepatit serolojilerinin araştırılması, seronegatif olanların aşılama ve kan ve vücut sıvılarıyla bulaşan patojenler, temas riskleri ile korunma yöntemleri hakkında eğitim almaları gerektiğine karar verildi.

Anahtar Kelimeler: Mesleki risk, hepatit A, hepatit B, hepatit C, seroprevalans

Introduction

Viral hepatitis is still an important health problem in our country. Healthcare workers (HCWs) are at a higher risk for acquiring viral hepatitis. They can get infected through percutaneous injury from a contaminated sharp instrument or exposure to infected blood and body fluids (1,2). Among HCWs, sero-positivity rates in different age groups from different cities and different occupational groups have been reported to vary between 77.5% and 100% for anti-hepatitis A virus (HAV) IgG, 1% and 4% for hepatitis B surface antigen (HBsAg) and 0% and 2% for anti-hepatitis C virus (HCV) (3,4,5,6). At hospitals, housekeeping staff generally work as subcontracted laborers and often change between the business and health-care sectors. They are a very difficult group to follow up because of frequent job switches but they have similar risks of acquiring viral hepatitis with other HCWs. In this study, we aimed to investigate viral hepatitis transmission risk, serologic status and vaccination rates in our hospital housekeeping staff who do not get any specific education and have different working conditions but have similar environmental risks with other HCWs.

Materials and Methods

The study was conducted between January 2013 and May 2013 in Yenimahalle Training and Research Hospital, a 250-bed secondary-care hospital. All 81 members of the cleaning staff (46 male, 35 female) were included in our research. The mean age of the subjects was 35.8 years (range: 20-53 years). A questionnaire was completed through a one-on-one interview with each housekeeping staff member, and data regarding education level, previous experience in working in a healthcare setting, previous participation in training programs covering occupational exposure to blood-borne pathogens and protection methods, and hepatitis B vaccination status were collected. Serological tests for hepatitis A, B and C were done using the direct chemiluminescence sandwich immune test method (ADVIA Centaur® CP Immunoassay System, Germany) in our microbiology laboratory. The test results were added to the form.

Results

Four subjects (4.9%) were found to be HBsAg-positive, 24 (29.6%) were anti-HBs-positive and 51 (63%) subjects were anti-HAV IgG-positive. None of them tested positive for anti-HCV (Table 1). One of them was unaware of being HBsAg-positive. Only 7 (8.6%) of them have previously received hepatitis B vaccine and 17 (21%) of them had natural immunity against hepatitis B. Anti-HAV IgG testing was not performed in 25 (30.9%) of them. Anti-HAV IgG sero-positivity rate was 91.1% for the remaining. Nearly half of them (39/81, 48.1%) were primary school graduates, 18 (22.2%) had completed secondary school and 24 subjects (29.6%) were high-school graduates. Only 14 of them (16%) had 0-5 years' experience and only one subject (2.5%) had 5-10 years' experience of working in a healthcare setting (Table 2). We had 15 (%18.5) housekeeping staff members who had worked at another hospital previously and 4 of them reported previous participation in training covering occupational exposure to blood-borne pathogens and protection methods. Thirty-nine of the 66 cleaning staff with no previous experience reported that they had received no training.

As a result, only 38.3% (31/81) in total had a previous training on exposure risks and protection methods. Two (2.5%) reported that they had had contact with contaminated material while not wearing gloves. Thirteen (16%) reported that they had been injured at least once with a sharp instrument (Table 2).

Discussion

HCWs, including housekeeping staff, are at risk of acquiring hepatitis following accidental exposure to blood and body fluids (1). This risk is higher in countries like Turkey where hepatitis is more common, since the HBsAg positivity rate in HCWs will be proportionate to the HBsAg positivity rate in the general population (7,8). In the literature, reported HBsAg sero-positivity rates among HCWs vary between 1% and 4.4%. Data from studies investigating the serologic status of hospital housekeeping staff revealed similar

Table 1. Hepatitis serology among the hospital housekeeping staff

	HBsAg	Anti-HBs	Anti-HCV	Anti-HAV IgG
Positive	4 (4.9%)	24 (29.6%)	0	51 (63%)
Not performed	0	0	0	25 (30.9%)
Negative	77 (95.1%)	57 (70.37%)	81 (100%)	5 (6.2%)

HBsAg: Hepatitis B surface antigen, HCV: Hepatitis C virus, HAV: Hepatitis A virus, IgG: Immunoglobulin

Table 2. The survey result among the hospital housekeeping staff

Number (%)	
Education	
Primary school	39 (48.1)
Secondary school	18 (22.2)
Highschool	24 (29.6)
Experience	
Nothing	66 (81.5)
0-5 years	14 (16.0)
5 <years	1 (2.5)
Training	
Had	28 (34.6)
Didn't have	50 (61.7)
Not remembering	3 (3.7)
Hepatitis B vaccination	
Had	60 (74)
Didn't have	17 (20.9)
Not remembering	4 (4.9)
Where got the vaccine	
At our hospital	53 (65.4)
Before starting the job	7 (8.6)
Not having the vaccine (natural immunity and HBsAg positive)	21 (26)
Contact with the medical waste without gloves	
Yes	2 (2.5)
No	79 (97.5)
Injury with a used instrument	
Yes	13 (16)
No	68 (84)

HBsAg sero-positivity rates between hospital housekeeping staff and HCWs, being between 1.5% and 4.4%. In our study, 4.9% of the hospital housekeeping staff were positive for HBsAg. To our knowledge, this is the highest encountered sero-positivity rate for this group when compared with the results of similar studies from Turkey (5,9). In the literature, reported anti-HBs sero-positivity rates and hepatitis B vaccination rates among HCWs ranges from 20.6% to 79.3% and from 44.4% to 90%, respectively (5,10,11,12). Vaccination rates were lower among HCWs working in private hospitals compared to those in state hospitals (5). Both in our study and in other studies, it has been shown that hepatitis B sero-positivity rate among HCWs is higher than in the normal population (13). One housekeeping staff member who was unaware of being HBsAg-positive was followed up by our infectious diseases clinic. It is important to test HCWs for HBsAg and follow up of sero-positives (11).

The rate of exposure to sharp injuries was 16% among hospital housekeeping staff in our study. This rate was lower than the rate reported in some of the previously published studies (80%). This might be due to the fact that the housekeeping staff were not questioned for repeated exposure to sharp injuries as well as underreporting and use of plastic boxes for the disposal of used sharp instruments (13,14,15,16). Although our rate of exposure to sharp injuries among hospital housekeeping staff was lower than the rates reported in other studies, it was still high and when the high HBsAg sero-positivity rate in our population is taken into consideration, the risk of contacting to the viral hepatitis is higher than expected (12,16). Hospital housekeeping staff are considered an at-high-risk group for percutaneous injuries (15,17). Even if the rate of glove use is high in our study, the real exposure rate with blood and body fluids is not known and this poses a risk for infection (14).

In our study, the anti-HAV IgG positivity rate was similar to that in studies published previously and it was similar to that in the normal population (3,6). There are some reports on hospital outbreaks of hepatitis A. The seropositivity for hepatitis A is age-dependent and the rate of vaccination among sero-negatives is very low (3,11,18,19). Housekeeping staff and HCWs working in nursing homes, infectious diseases or pediatric clinics are at a higher risk for hepatitis A (20). Seronegative HCWs and housekeeping staff, especially those working in these high risk areas, should get vaccinated.

None of the housekeeping staff tested positive for anti-HCV. Data from studies performed between 2008 and 2012 among HCWs revealed anti-HCV positivity rates between 0% and 0.49% (4,6). In our study, none of the hospital housekeeping staff tested positive for anti-HCV. This result was similar to the normal population (4,10).

In our study, the rate of previous hepatitis B vaccination among hospital housekeeping staff was 8.6% which is very low and emphasizing the importance of hepatitis serology testing and vaccination in this group. In a study done in 2003 by Şencan et al., (21) the rate of hepatitis B vaccination among HCWs was 7.1%. In our study, the rate is similar reflecting that the attitude of HCWs towards vaccination did not improve in more than one decade. The rate of vaccination in hospital housekeeping staff was lower than in other HCWs (8,12). Not receiving any training on the risks of exposure to blood and body fluids and protection

methods increases the risk of hepatitis transmission (8). Our results showed that although hepatitis serology screening tests were performed routinely and there was a training and vaccination program in place at our hospital, 61.2% of housekeeping staff did not receive any training and a high (16%) sharp injury rate was reported. We assume that this situation was due to high employee turnover.

We conclude that annual training, screening and vaccination programs are not sufficient for hospital housekeeping staff since they might miss the program as a result of employee turnover. We suggest that immediately upon starting the job, hepatitis screening tests, vaccinations and a training program about exposure risks and protection methods should be performed for this group of workers.

Ethics

Ethics Committee Approval: The study weren't approved by any Ethics Committee, Informed Consent: Consent form wasn't filled out by the participants.

Peer-review: External and Internal peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: Semiha Solak Grassie, Concept: Semiha Solak Grassie, Sümeyra Çetin Gevrek, Design: Semiha Solak Grassie, Data Collection or Processing: Sümeyra Çetin Gevrek, Analysis or Interpretation: Semiha Solak Grassie, Literature Search: Semiha Solak Grassie, Writing: Semiha Solak Grassie.

Conflict of Interest: No conflict of interest was declared the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

Solak Grassie S, Çetin Gevrek S. Investigation of Hepatitis Serology and Occupational Exposure Risk to Viral Hepatitis of Hospital Housekeeping Staff. *Viral Hepatitis J* 2016;22:14-17.

References

1. Tarantola A, Abiteboul D, Rachline A. Infection risks following accidental exposure to blood or body fluids in health care workers: a review of pathogens transmitted in published cases. *Am J Infect Control*. 2006;34:367-375.
2. Williams IT, Perz FJ, Bell BP. Viral hepatitis transmission in ambulatory health care settings. *Clin Infect Dis*. 2004;38:1592-1598.
3. Mıstık R. Hepatit A Virüs Enfeksiyonunun Epidemiyolojisi. Eds. Tabak F, Tosun S. *Viral hepatit 2013*. 1. baskı, İstanbul, İstanbul Tıp Kitabevi, 2013;s.13-23.
4. Mıstık R. Hepatit C Virüs Enfeksiyonunun Epidemiyolojisi. Eds. Tabak F, Tosun S. *Viral hepatit 2013*. 1. baskı, İstanbul, İstanbul Tıp Kitabevi, 2013.s.83-112.
5. Tosun S. *Türkiyede Viral Hepatit B Epidemiyolojisi Yayınların Metaanalizi*. Eds. Tabak F, Tosun S, *Viral hepatit 2013*. 1.Baskı, İstanbul, İstanbul Tıp Kitabevi, 2013.s.27-80.
6. Dokuzoğuz B. *Enfeksiyon Kontrolü ve Personel Sağlığı Sağlık Çalışanlarının Yaralanma ve Enfeksiyondan Korunması*. Eds. Doğanay M, Ünal S, Çetinkaya Şardan Y. *Hastane Enfeksiyonları 2013*. 2.Baskı, Ankara, Bilimsel Tıp Yayınevi, 2013.s.523-54.
7. Wu HC, Ho JJ, Chen CJ, Guo YL, Shiao JS. Incidence of percutaneous injury in Taiwan healthcare workers. *Epidemiol Infect*. 2015;12:1-8.
8. Ziraba AK, Bwogi J, Namale A, Wainaina CW, Mayanja-Kizza H. Sero-prevalence and risk factors for hepatitis B virus infection among healthcare workers in a tertiary hospital in Uganda. *BMC Infect Dis*. 2010;10:191.

9. Uludağ Altun H, Erarslan A, Özdemir G. Seroprevalence of HBV, HCV and HIV among healthcare workers in a secondary care hospital. *Viral Hepatitis Journal*. 2012;18:120-122.
10. Rybacki M, Piekarska A, Wiszniewska M, Walusiak-Skorupa J. Hepatitis B and C infection: is it a problem in Polish healthcare workers? *Int J Occup Med Environ Health*. 2013;26:430-439.
11. Schryver AD, Claesen B, Meheus A, Van Sprundel M, François G. European survey of hepatitis B vaccination policies for healthcare workers. *Eur J Public Health*. 2010;21:338-343.
12. Batra V, Goswami A, Dadhich S, Kothari D, Bhargava N. Hepatitis B immunization in healthcare workers. *Ann Gastroent*. 2015;28:276-280.
13. Baysal B, Şafak K. Seroprevalence of HBV, HCV and HIV among healthcare workers in a training and research hospital. *Viral Hepatitis Journal*. 2012;18:94-97.
14. Askarian M, Yadollahi M, Kouchak F, Danaei M, Vakili V, Momeni M. Precautions for health care workers to avoid hepatitis B and C virus infection. *Int J Occup Environ Med*. 2011;2:191-198.
15. Yoldaş Ö, Bulut A, Ertürk E, Çelik D, Karakaşoğlu Ü, Altındaş M. Determination of exposure risk to infected blood and body fluids in health care workers. *Kocatepe Medical Journal*. 2014;15:297-300.
16. Falagas ME, Karydis I, Kostogiannou I. Percutaneous exposure incidents of three health care personnel in a newly founded tertiary hospital: a prospective study. *Plos One*. 2007;2:194.
17. Medeiros WP, Setúbal S, Pinheiro PY, Dalston MO, Bazin AR, de Oliveira SA. Occupational hepatitis C seroconversions in a Brazilian hospital. *Occup Med*. 2012;62:655-657.
18. Chodic G, Ashkenazi S, Lerman Y. The risk of hepatitis A infection among healthcare workers: a review of reported outbreaks and sero-epidemiologic studies. *J Hosp Infect*. 2006;62:414-420.
19. Guturu P, Cicalese L, Duchini A. Hepatitis A vaccination in healthcare personnel. *Ann Hepatol*. 2012;11:326-329.
20. Borg MA, Portelli A. Hospital laundry workers –an at-risk group for hepatitis A. *Occup Med*. 1999;7:448-450.
21. Şencan İ, Şahin İ, Kaya D, Bahtiyar Z. Seroprevalence of hepatitis B and hepatitis C in healthcare workers in a new established medical faculty hospital. *Viral Hepatit Derg*. 2003;8:47-50.