Annals of Medical Research
DOI: 10.5455/annalsmedres.2019.04.208 2019;26(8):1503-7

Original Article

Investigation preoperative seroprevalence of HBsAg, anti-HBS, anti-HCV, anti-HIV and vaccination level of patients undergoing dental surgical procedure under local anesthesia

Bilal Ege[1], Ayse Ozcan Kucuk[2], Mahmut Koparal[1]

[1]Adiyaman University, Faculty of Dentistry Department of Oral and Maxillofacial Surgery, Adiyaman, Turkey
[2]Mersin University, Faculty of Dentistry Department of Oral and Maxillofacial Surgery, Mersin, Turkey

Abstract

Aim: Health care workers especially dentists are at risk due to the fact that they are in direct contact with the blood and body fluids. In the present study, it was aimed to determine the preoperative seropositivity of HBsAG, anti-HBs, anti-HCV, and anti-HIV in the patients undergoing dental surgical procedure under local anesthesia.

Material and Methods: 1598 patients who were admitted to Department of Oral and Maxillofacial Surgery between 2017-2018 and underwent surgical intervention for various reasons were included. Demographic data and serum samples taken preoperatively from patients were retrospectively evaluated in terms of HBsAg, Anti-HBs, Anti-HCV and Anti-HIV seropositivity by using archive records. Furthermore, the vocational and educational status of the HBsAg (+) patients in addition their awareness about hepatitis were investigated.

Results: Of the 1598 patients, 591 (37%) were males; 1007 (63%) were females. The total number of patients with HBV carriers was 73 (4.6%), the number of anti-HBs-positive patients was 828 (51.8%), and the number of anti-HCV-positive patients was 3 (0.19%). Anti-HIV positivity has been observed in none of the patients. When evaluated according to the age ranges, HBsAg was mostly detected positive in the age ranges of 21-30 and 30-40; when evaluated according to sex, HBsAg was detected higher in women.

Conclusions: Knowing the prevalence of infectious diseases is highly important for both the prevention and early diagnosis of these diseases. Besides, knowing the seropositivity of these diseases before surgical interventions will facilitate for both oral and maxillofacial surgeons and other health care personnel to take necessary safety precautions against disease transmission. For this purpose, although it was observed in our study that the preoperative HBsAg, anti-HBs, anti-HCV and anti-HIV seroprevalence were not higher than those in the population were, all health care workers should be trained in occupational diseases, vaccinated and followed up at regular intervals.

Keywords: HBsAg; Anti-HCV; Anti-HIV; local anesthesia; dental surgery; seroprevalance; vaccine.

INTRODUCTION

Infectious diseases caused by human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) are among the leading causes of death worldwide. In addition, these infections continue to cause severe health problems day by day both in our country and in the world (1). As HBV, which can lead to severe complications such as cirrhosis, hepatocellular carcinoma and liver failure, is not yet possible to be completely eliminated by current antiviral treatments, the importance of protection from this infection has increased over time (2). At the same time, HCV infection, a global health problem, is also a leading cause of cirrhosis and hepatocellular carcinoma (3). HIV infection, on the other hand, is a viral syndrome with a fatal course and it was first reported in 1985 in Turkey (4). Around the world in 2015, approximately 36.7 million people were reported to be infected with HIV (5). 257 million people with chronic HBV and 71 million people with HCV (6).

The World Health Organization (WHO) estimates that

Received: 09.05.2019 **Accepted:** 18.06.2019 **Available online:** 31.07.2019
Corresponding Author: Bilal Ege, Adiyaman University, Faculty of Dentistry Department of Oral and Maxillofacial Surgery, Adiyaman, Turkey, **E-mail:** miregein@gmail.com

the two million injuries lead to approximately 66.000 HBV, 16.000 HCV and about 1000 HIV among 35 million healthcare workers every year (7,8). On the other hand, Turkey is located in middle-endemic for HBV seropositivity and in low endemic area in terms of HCV positivity. HIV seroprevalence is very low in our country (7).

The dentists, especially oral and maxillofacial surgeons, are in close contact with blood from a professional point of view. Furthermore, they are more likely to be exposed to pathogens such as HBV, HCV and HIV through percutaneous injuries, particularly contaminated sharp object injuries, and the contact of infected body fluids with their disintegrated skin or mucosa during dental treatments and interventional procedures (9). Therefore, dentists have the highest incidence of HBV infection among health care workers, and this incidence increases with the length of clinical experience of the dentist (10). Following dentists, nurses, dialysis unit personnel, laboratory personnel and doctors also have a high prevalence of HBV and HCV (11).

Therefore, dentists have the highest incidence of HBV infection among health care workers, and this incidence increases with the length of clinical experience of the dentist (10). Following dentists, nurses, dialysis unit personnel, laboratory personnel and doctors also have a high prevalence of HBV and HCV (11).

In the literature, a higher prevalence of HBV infection has been reported in dentistry, especially in surgical specialties (oral and maxillofacial surgery and periodontology) than in the general population (12,13). Besides, the risk of HBV transmission to dentists and oral surgeons has been reported to be higher than other blood-borne infections such as HCV and HIV (14).

The aim of this study was to determine HBsAG, Anti-HBs, Anti-HCV, Anti-HIV seropositivity of blood samples taken preoperatively from patients undergoing dental surgical procedure under local anesthesia.

MATERIAL and METHODS

Study Design

1598 patients who referred to the Oral and Maxillofacial Surgery Clinic of the Faculty of Dentistry at Adıyaman University between 2017-2018 and who underwent a surgical intervention followed by an appointment scheduled for a local surgery as a result of the examination were included in this study. After receiving an approval from the Non-Invasive Research Ethics Committee of Adiyaman University (Approval number: 2019/1-26), the results of blood samples taken from the patients in the preoperative period, clinical and demographic data were examined retrospectively.

Blood tests and analysis results were performed in the Microbiology Laboratory of Adıyaman University Training and Research Hospital. In the serum samples, and in the serum samples, Hepatitis B surface antigen (HBsAg), antibodies against Hepatitis B surface antigen (Anti-HBs), HCV antibody (Anti-HCV) and HIV antibody (Anti-HIV) which were serological markers of Hepatitis B, hepatitis C and HIV infection were studied by AUSAB and AUSZYME (Abbott Laboratories, Abbott Park, USA)-, ELISA (Enzyme Linked Immunosorbent Assay) method in accordance with the manufacturer's recommendations. Normal values in accordance with the manufacturer's kit package insert was considered as 0-0.99 IU/ml for HBsAg; 0-10 IU/ml for anti-HBs; 0-0.99 S/CO for anti-HCV and finally 0.00-0.99 S/CO for Anti-HIV. The positive HBsAg, anti-HCV, anti-HIV 1/2 results were re-studied with the same kit and the same sera and they were evaluated as positive for samples with positive repetitive reactivity.

Age, gender, carriage and immune status of each patient were determined, occupational and educational status of the patients with positive HBsAg, whether they had previously undergone dental treatment, the presence of family history of hepatitis, whether they had undergone surgery or not, and their distribution according to their vaccination status were examined.

Statistical analysis

The statistical package program SPSS 20 (SPSS, Inc, Chicago, IL, USA) was used for statistical evaluation of the obtained data. In statistical analysis, frequency and percentage values were calculated.

RESULTS

Of the 1598 patients in the study, 37% (n=591) were males; 63% (1007) of them were females. The total number of patients with HBV carriers was 73 (4.6%), the number of anti-HBs-positive patients was 828 (51.8%), and the number of anti-HCV-positive patients was 3 (0.19%). No anti-HIV positivity was observed in any of the patients (Table 1 and 2). Of the 73 HBSAg positive patients, 32 were males and 41 were females; Of the 828 patients with positive anti-HBs, 295 were males and 533 were females. Of anti-HCV positive patients, 1 was male and 2 were females. The distribution of seropositivity according to age and gender is presented in Table 3.

73 patients with HBsAg seropositivity were re-called for a detailed anamnesis, however 59 of these patients were reached, and then the occupational group, educational status and awareness status of the patients were determined. The highest incidence rate of HBSAg infection was in officer-teacher (27.1%) and freelance (27.1%) groups. Besides, of these patients, 21 were university graduates, 13 were high school graduates, 11 were secondary school graduates, 9 were primary school graduates and 5 were not literate (Table 4).

While the 76.3% (n=45) of 59 HBsAg (+) patients went to the dentist for any reason before, 62.2% (n=28) of these patients stated that underwent oral surgery. Of the 59 patients, 38 were aware that their HBsAg was positive before surgery; whereas 21 patients were not aware of the fact that they were HBsAg (+). Of the patients who were aware of the fact that they were HBsAg (+), 76.3% (n=29) reported this condition when they went to the physician

or dentist, whereas 23.7% (n=9) reported that they did not state it. Finally, it was found out that 28.8% (n=17) of 59 patients with HBsAg-positive had patients with hepatitis or carriers in their families (Table 5).

Table 1. Distribution of patients by age and gender

	Gender		
Age groups	**Male n (%)**	**Female n (%)**	**Total**
0-20	66 (33.2)	133 (66.8)	199
21-30	248 (32.5)	516 (67.5)	764
31-40	171 (43)	227 (57)	398
41-50	61 (48)	66 (52)	127
51-60	28 (43.8)	36 (56.2)	64
>60	17 (37)	29 (63)	46
Total	**591 (37)**	**1007 (63)**	**1598**

Table 2. The tests examined and seropositivity rates

	HBsAg n /%	**Anti-HBs n /%**	**Anti-HCV n /%**	**Anti-HIV n /%**
Positive	**73/4.6**	**828/51.8**	**3/0.19**	**0/0**
Negative	1525/95.4	770/48.2	1595/99.81	1598/100
Total	1598/100	1598/00	1598/100	1598/100

Table 3. Distribution of seroprevalence by age and gender

Age groups	**Seropositivity**			
	HBsAg n (M/F)	**Anti-HBs n (M/F)**	**Anti-HCV n (M/F)**	**Anti-HIV n (M/F)**
0-20	2 (0/2)	128 (40/88)	0 (0/0)	0 (0/0)
21-30	29 (8/21)	460 (153/307)	2 (0/2)	0 (0/0)
31-40	29 (17/12)	145 (66/79)	0 (0/0)	0 (0/0)
41-50	7 (3/4)	55 (21/34)	1 (1/0)	0 (0/0)
51-60	3 (2/1)	22 (10/12)	0 (0/0)	0 (0/0)
>60	3 (2/1)	18 (5/13)	0 (0/0)	0 (0/0)
Total %	**73 (32/41) 4.6 (2/2.6)**	**828 (295/533) 51.8 (18.5/33.3)**	**3 (1/2) 0.19 (0.06/0.12)**	**0 (0/0) 0 (0/0)**

Table 4. Vocational and educational status of HBsAg (+) patients

HBsAg (+)	**n**	**% Should be aligned**
Vocational tatus		
Worker	11	18.6
Officer-Teacher	16	27.1
Freelance	16	27.1
Unemployed	9	15.3
Student	7	11.9
Total	**59**	**100**
Educational status		
No literacy	5	8.4
Primary school	9	15.3
Middle School	11	18.7
High school	13	22.0
University	21	35.6
Total	**59**	**100**

Tablo 5. Awareness of HBsAg (+) patients

HBsAg (+) patients	**n**	**%**
Did you go to the dentist for any reason before contacting us? (n:59)		
Yes	45	76.3
No	14	23.7
Have you had any dental treatment especially surgical operation if you have gone? (n:45)		
Yes	28	62.2
No	17	37.8
Are you aware that you are HBsAg positive before? (n:59)		
Aware	38	64.4
Not aware	21	35.6
Do you state HBsAg (+) when you go to the dentist or doctor? (n:38)		
Yes	29	76.3
No	9	23.7
Does your family have hepatitis? (n:59)		
Yes	17	28.8
No	13	22.1
No idea	29	49.1

DISCUSSION

HBV, HCV and HIV are among the major health problems worldwide. In the researches conducted in countries such as Ethiopia, Egypt, Morocco, Turkey and Italy, the prevalence of HBV and HCV was reported to be high due to various risk factors, particularly dental treatments (15). It was reported that the prevalence of HBV infection varied considerably according to geographical regions and this rate varies between 0.1% and 20% (16). Besides, the prevalence and carrier rates of HBV infection were reported to vary according to the areas of high, moderate and low endemicity, age, occupational groups and socioeconomic status of the examined persons (17).

According to the WHO, Turkey is a moderate endemic area for HBV and seropositivity rates were reported as 0.52-4.19% for HBsAg in the conducted studies although they varied from region to region in Turkey (18-22). In these studies, it is observed that the epidemiology of HBV and HCV infections is mostly performed on blood donors and other risk groups. In the studies of Uzun et al. (18), the records of 80,454 blood donors in the Aegean region between 2004 and 2010 were retrospectively examined in terms of HBsAg, anti-HCV and anti-HIV. As a result, they determined that anti-HCV and anti-HIV positivity were 312 (0.38%) and 2 (0.002%), respectively, while determining that HBsAg was positive in 1.054 donors (1.31%). Tozun et al. (19), on the other hand, investigated the seroprevalence of the HBV, HCV and hepatitis delta virus (HDV) infections in the general population in Turkey, and they detected that the seropositivity rates for HBsAg, anti-HCV, anti-HBs and hepatitis B core antibody (anti-HBc) were 4.0%, 1.0%, 31.9% and 30.6%. As a result of the study, they revealed that at least one third of the population in Turkey was

exposed to HBV infection. Igde et al. (20) investigated the seroprevalence of Hepatitis B in all age groups in the north of Turkey and determined that the seropositivity of HBsAg and anti-HBs were 4% and 38.3%, respectively. Onerci Celebi et al. (21), in their studies, also retrospectively examined the seroprevalence of HBV, HCV and HIV in 3731 patients who underwent septoplasty between 2005 and 2015. As a consequence, it was reported that HBsAg was positive in 117 (3.6%) patients, anti-HCV was positive in 12 (0.3%) patients, and anti-HIV was positive in 7 (0.2%) patients, and therefore routine preoperative serological tests were required to be performed in patients undergoing septoplasty under general or local anesthesia (21). Dilek et al. (22), on the other hand, determined the HBsAg anti-HCV and anti-HIV seropositivity rates in 39.002 blood donors in the east of Turkey as 2.55%,0.17% and 0.036%, respectively, and these rates were reported to be lower than those in many regions of Turkey. The seropositivity rates for HBsAg, HCV and HIV in our study were determined similar to the results of previous studies (18-22).

In our study, HBsAg-positive patients were determined to be higher in the age range of 21-30 and 30-40 years. HBsAg positivity rate was found to be higher in the civil servant-teacher and self-employed groups-Interestingly it was detected that the higher the education level, the higher the HBsAg positivity rate. In spite of the fact that the exact cause of this condition is not known, we believe that detailed studies in the larger population will reveal significant results.

Of 59 patients who were HBsAg-positive and could be reached later, 21 were not aware of HBsAg-positivity before the surgery, while only 38 of these patients were were aware that they were HBsAg-positive. However, these numbers alone cannot be trusted. Because most of these diseases are sexually transmitted and therefore some of the people who know that they have diseases may be reluctant to state that they have an infectious disease. Some of the patients also believe that the current infectious disease is not important and therefore does not inform the physician during the anamnesis. For this reason, physicians and other healthcare workers can take preoperative preventive measures against disease transmission in accordance with the results obtained by conducting such seroprevelance studies. Furthermore, knowing these rates, provides significant advantages as it protects the patient from possible future complications with early diagnosis of the disease as well as increasing patient awareness.

HCV, which resembles hepatitis B virus regarding routes of transmission, still continues to be a significant health problem due to its tendency to become chronic. In a meta-analysis study, it was reported that the number and prevalence of anti-HCV positive individuals worldwide increased from 2.3% to 2.8% between 1990 and 2005 (23). According to the WHO, Turkey has a low prevalence of HCV infection. The seropositivity rates for anti-HCV in Turkey was reported to be 0.1-1% (21). Also, in our study, this positivity rate for anti-HCV was determined to be 0.19%, in accordance with the literature (19,21).

HIV, which causes severe damage to the immune system and leads to a chronic infection with fatal outcome, is another viral effect that is transmitted in a similar way to hepatitis viruses. Around the world, 35 million people are infected with HIV, and approximately 3.2 million of these people are under 15 years of age (24). The first case of AIDS in Turkey where the prevalence of HIV / AIDS is low was reported in 1985. In our country, there were 19.748 HIV (+) persons and 1772 AIDS cases reported by positive detection of the verification test from 1985 to 31 December 2018. A total of 3356 cases including 3248 HIV (+) persons and 108 AIDS cases were reported by positive detection of the verification test between January 01 and December 31, 2018. An increase in disease is observed by years (25). In our study, on the other hand, no anti-HIV positivity was observed in any of the patients.

The routes of transmission of all three viruses are similar and can be transmitted in a variety of ways, including perinatal, sexual contact, intravenous drug use, and contaminated blood products. Percutaneous transmission ranks first, especially for healthcare workers. While healthcare personnel are in the high-risk group for such infectious agents, this risk is further increased by the fact that dentists and particularly surgical specialists are exposed to more percutaneous injury and blood and secretion than other healthcare workers (21).

CONCLUSION

In the present study, it was revealed that HBsAg, anti-HCV and anti-HIV seroprevalence were similar in the population. However, dentists, surgical specialists and other healthcare personnels should not work, regardless of the preoperative serologic tests of the patients, should be trained in occupational diseases and should be followed at regular intervals by being vaccinated against the disease. Furthermore, considering the possibility of patients not saying their infectious diseases, taking all possible security measures before the surgery is highly important for protection from disease.

Acknowledgments
The authors would like to thank the Department of Infectious Diseases and Microbiology Laboratory of Adiyaman University Training and Research Hospital.

Competing interests: The authors declare that they have no competing interest.
Financial Disclosure: There are no financial supports
Ethical approval: The necessary approval was obtained from Ethical Review Board of Adiıyaman University Ethics Committee (Approval number: 2019/1-26).

Bilal Ege ORCID: 0000-0002-1279-0893
Ayse Ozcan Kucuk ORCID: 0000-0002-8289-8066
Mahmut Koparal ORCID: 0000-0003-1817-1230

REFERENCES

1. Dong Y, Qiu C, Xia X, et al. Hepatitis B virus and hepatitis C virus infection among HIV-1-infected injection drug users

in Dali, China: prevalence and infection status in a cross-sectional study. Arch Virol 2015;160:929-36.
2. Zoulim F, Perrillo R. Hepatitis B. Reflections on the current approach to antiviral therapy. J Hepatol 2008;48:2-19.
3. Turhanoğlu M, Onur A, Bilman FB, et al. Eight-year seroprevalence of HBV, HCV and HIV in Diyarbakir training and research hospital. Int J Med Sci 2013;10:1595-601.
4. Akpınar O, Akpınar H. Preoperative Seroprevalence of HBsAg, Anti-HCV, Anti-HIV in patient with dental surgery under general anesthesia. SDU The J Health Sci 2018;9:37-41.
5. UNAIDS: Aids by the numbers 2016. https://www.unaids.org/sites/default/files/media_asset/global-AIDS-update-2016_en.pdf access date 25.07.2019
6. World Health Organization. Global Hepatitis Report, 2017. http://apps.who.int/iris/bitstream/10665/255016/1/9789241565455-eng.pdf?ua=1 access date 25.07.2019
7. Hosoglu S, Akalin S, Sunbul M, et al. Occupational Infections study g healthcare workerse compliance with universal precautions in Turkey. Med Hypotheses 2011;77:1079-82.
8. Moro PL, Moore A, Balcacer P, et al. Epidemiology of needlesticks and other sharps injuries and injection safety practices in the Dominican Republic. Am J Infect Control 2007;35:552-9.
9. Gooch BF, Siew C, Cleveland JL, et al. Occupational blood exposure and HIV infection among oral and maxillofacial surgeons. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1998;85:128-34.
10. Nagao Y, Matsuoka H, Kawaguchi T, et al. HBV and HCV infection in Japanese dental care workers. Int J Mol Med 2008;21:791-9.
11. Kashyap B, Tiwari U, Prakash A. Hepatitis B virus transmission and health care workers: epidemiology, pathogenesis and diagnosis. Ind J Med Special 2018;9:30-5.
12. Martins AM, Barreto SM. Hepatitis B vaccination among dentists surgeons. Rev Saude Publica 2003;37:333-8.
13. Ahmad Akhoundi MS, Momeni N, Norouzi M, et al. Prevalence of blood-borne viruses among Iranian dentists: Results of a national survey. Int J Occup Med Environ Health 2015;28:593-602.
14. Thomas DL, Gruninger SE, Siew C, et al. Occupational risk of hepatitis C infections among general dentists and oral surgeons in North America. Am J Med 1996;100:41-5.
15. Al-Amad S. Prevalence of hepatitis B, C, and HIV among patients attending a teaching dental hospital. A 7-year retrospective study from the United Arab Emirates. Saudi Med J 2018;39:500-5.
16. Lok AS, McMahon BJ. Chronic hepatitis B: update 2009. Hepatology 2009;50:661-2.
17. Delialioglu N, Ozturk C, Aslan G. Seroprevalence of HBsAg, Anti-HBs, Anti-HCV and Anti-HDV in Mersin. Viral Hepat J 2001:7;416-9.
18. Uzun B, Gungor S, Demirci M. Seroprevalence of transfusion transmissible infections among blood donors in western part of Turkey: a six-year study. Transfus Apher Sci 2013;49:511-5.
19. Tozun N, Ozdogan O, Cakaloglu Y, et al. Seroprevalence of hepatitis B and C virus infections andrisk factors in Turkey: a fieldwork TURHEP study. Clin Microbiol Infect 2015;21:1020-6.
20. Igde FA, Taskin H, Igde M, et al. Where we are in the fight against Hepatitis B Infection; Trends in Hepatitis B virus seroprevalence in Black Sea Region of Turkey. Niger J Clin Pract 2018;21:87-92.
21. Onerci Celebi O, Araz Server E, Hamit B, et al. The seroprevalence of hepatitis B, hepatitis C, and human immunodeficiency virus in patients undergoing septoplasty. Braz J Otorhinolaryngol 2018;84:34-9.
22. Dilek I, Demir C, Bay A, et al. Seropositivity rates of HBsAg, anti-HCV, anti-HIV and VDRL in blood donors in Eastern Turkey. Turk J Haematol 2007;24:4-7.
23. Mohd Hanafiah K, Groeger J, Flaxman AD, et al. Global epidemiology of hepatitis C virus infection: new estimates of age-specific antibody to HCV seroprevalence. Hepatology 2013;57:1333-42.
24. UNAIDS. Gap Report 2014. http://files.unaids.org/en/media/unaids/contentassets/documents/unaidspublication/2014/UNAIDS_Gap_report_en.pdf access date 25.07.2019
25. T.C Sağlık Bakanlığı. Türkiye Halk Sağlığı Kurumu Bulaşıcı Hastalıklar Daire Başkanlığı Zührevi Hastalıklar Birimi. HIV-AIDS istatistik. https://hsgm.saglik.gov.tr/tr/bulasici-hastaliklar/862-hiv-aids/1135-h%C4%B1v-aids-istatislik.html access date 25.07.2019