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ORIGINAL ARTICLE
ORİJİNAL ARAŞTIRMA

HAV, HBV, HCV and HIV Seroprevalence in Patients Who Requested ELISA Examination in the Emergency Department, a Retrospective Study

Acil Serviste ELISA Tetkiki İstenen Hastalarda HAV, HBV, HCV ve HIV Seroprevalansı, Retrospektif Bir Çalışma

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ABSTRACT

Introduction: The aim of this study is to determine the seroprevalence of HAV, HBV, HCV and HIV in patients who applied to the emergency service for hepatitis viruses and HIV serology, to examine their correlation with their admission complaints, and to document the incidence of positivity in the community cross-sectionally by determining the proportion of risky patients who applied to the emergency department

Material and Method: Among the patients who applied to the emergency department between January 2022 and December 2022, anti-HAV IgM, HBsAg, anti-HBc IgM, HIV Ag/Ab (antigen/antibody) (HIV-1/ HIV-2 IgM and IgG antibodies and HIV-1 antibodies) cases that were requested to be tested for p24 antigen) were included in the study

Results: General characteristics of the patients, Viral markers measured by ELISA method and their distribution by gender, Viral markers measured by ELISA method and their distribution by nationality and Leading search reasons in serology examinations were evaluated.

Conclusion: This study has data that can reflect the society in terms of the place where it was conducted and the number of patients included in the study. With the sensitivity of the Ministry of Health on the subject and the impact of the intensive work of the primary care on vaccination, we have found satisfactory results in terms of transmission and vaccination.

Keywords: Seroprevelance, ELISA, emergency medicine

ÖZ

Giriş: Bu çalışmanın amacı acil servise hepatit virüsü ve HIV serolojisi ile başvuran hastalarda HAV, HBV, HCV ve HIV seroprevalansını belirlemek, başvuru şikayetleri ile ilişkisini incelemek ve pozitiflik insidansını belgelemektir. acil servise başvuran riskli hasta oranını belirleyerek toplum kesitsel olarak

Gereç ve Yöntem: Ocak 2022-Aralık 2022 tarihleri arasında acil servise başvuran hastalarda anti-HAV IgM, HBsAg, anti-HBc IgM, HIV Ag/Ab (antijen/antikor) (HIV-1/ HIV-2 IgM ve IgG antikorları ve p24 antijeni için test edilmesi istenen HIV-1 antikorları) vakaları çalışmaya dahil edildi.

Bulgular: Hastaların genel özellikleri, ELISA yöntemi ile ölçülen viral belirteçler ve cinsiyete göre dağılımı, ELISA yöntemi ile ölçülen viral belirteçler ve uyruğuna göre dağılımı ve seroloji incelemelerinde öne çıkan arama nedenleri değerlendirildi.

Sonuç: Bu çalışma, yapıldığı yer ve çalışmaya dahil edilen hasta sayısı açısından toplumu yansıtabilecek verilere sahiptir. Sağlık Bakanlığı'nın konuyla ilgili hassasiyeti ve birinci basamak sağlık hizmetlerinin yoğun çalışmasının aşılamaya da etkisi ile bulaşma ve aşılama açısından yüz güldürücü sonuçlar bulduk.

Anahtar Kelimeler: Seroprevelans, ELİSA, acil tıp

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INTRODUCTION

Despite the widespread use of screening methods in recent years, the importance given to worker health, the widespread use of workplace medicine, public service announcements and in-service trainings on infectious diseases transmission methods, Hepatitis A (HAV), hepatitis B virus (HBV) transmitted by blood and/or oral route. Transmission is increasing in viral infections such as hepatitis C virus (HCV) and Human immunodeficiency virus (HIV) (1). Due to the increasing population density and immigration, primary care preventive and screening health services are insufficient in some regions.

According to the 2017 World Hepatitis Report, the global prevalence of HBV infection is 3.5% in 2015, and there are 2 billion people who have encountered HBV in the world, approximately 240 million-257 million people live with HBV infection, 2.7 million of them with HIV, 10-15% It is estimated that 1% of them are co-infected with HCV (2). According to the World Hepatitis report, in 2015, 71 million people were living with chronic HCV infection, and 1.75 million new HCV infections were diagnosed. 2.3 million people living with HIV also have HCV infection (2). HIV has reached almost the entire population of the world, and according to the data of The Joint United Nation Program on HIV/AIDS (UNAIDS) for 2022, 38.4 million people were infected with HIV in 2021 and 650000 people died due to HIV/AIDS-related causes (3). There are 30293 HIV-infected individuals and 2083 AIDS cases in our country, from 1985 to 31 December 2021, whose confirmation test was positive and reported. On the other hand, between January 1, 2021 and December 31, 2021, a total of 3002 cases, including 2922 HIV-infected individuals and 80 AIDS cases, were positive for confirmatory tests (4).

Although viral markers are not routinely examined in admissions to the emergency department; It is requested before the operation in the etiology of elevated liver function tests (LFT), workplace accidents by healthcare professionals, resistant fever and unexplained etiology of unconsciousness.

The aim of this study is to determine the seroprevalence of HAV, HBV, HCV and HIV in patients who applied to the emergency service for hepatitis viruses and HIV serology, to examine their correlation with their admission complaints, and to document the incidence of positivity in the community cross-sectionally by determining the proportion of risky patients who applied to the emergency department.

MATERIAL METHOD

The study was carried out with the permission of the İzmir Kâtip Celebi University Non-Invasive Clinical Research Ethics Committee (Date: 21.04.2022 -Decision No: 0188). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

Study Design and Setting

This single-center, retrospective cross-sectional study was conducted in an emergency medicine clinic of a tertiary education and research hospital. Our hospital is one of the hospitals where the most emergency service applications are made in the city center where it is located.

Participants

Among the patients who applied to the emergency department between January 2022 and December 2022, anti-HAV IgM, HBsAg, anti-HBc IgM, HIV Ag/Ab (antigen/antibody) (HIV-1/ HIV-2 IgM and IgG antibodies and HIV-1 antibodies) cases that were requested to be tested for p24 antigen) were included in the study. Patients with missing data were excluded from the study. The demographic characteristics of the patients included in the study, the indications of the examinations (suspicion of viral hepatitis, liver dysfunction, before hemodialysis and interventional procedures, etc.) and examination results were recorded in the study data form.

Outcome Measures

Anti-HAV IgM, HBsAg, anti-HBc Ig M, HIV Ag/Ab results were obtained in the microbiology laboratory with Abbott Architect I2000SR (Architect, Abbott, USA) macro-ELISA device autoanalyzer and chemiluminescence immunoassay (Chemiluminescence) technique. The results were evaluated based on the operating criteria of the commercial kit. 0.80 U/L for anti-HAV IgM, 0.90 U/L for HBsAg, 0.90 U/L for anti-HCV, greater than 1 U/L for HIV Ag/Ab and for anti-HBc IgM If ≥1 U/L samples were considered positive. In addition, confirmatory test results were accepted as definitive results for those who were HIV Ag/Ab positive.

Statistical Analysis

IBM SPSS Statistics 28 (SPSS Inc., Chicago, USA) program was used for data analysis. Descriptive statistics are presented with frequency, percentage, mean and standard deviation values. Whether the data conformed to the normal distribution was evaluated using the Shapiro-Wilk test, skewness- kurtosis values, and Q-Q plots. Independent Samples t-Test was used for data conforming to normal distribution in the comparison of two independent groups. The chi-square test was used to compare two or more categorical groups. A p value of <0.05 was considered significant. All statistics were done at 95% confidence interval.

RESULTS

Considering the sociodemographic characteristics of 4799 patients admitted to the emergency department and included in our study, 2056 (42.8%) were female and 2743 (57.2%) were male. The mean age of women is 54.4±22.8, while that of men is 46.4±20.8. Of the cases, 4622 (96.3%) were citizens of the Republic of Turkey (T.R.), 144 (3%) were Syrian citizens, 8 (0.2%) were from Europe, 16 (0.3%) were from Asia, and 9 (0.2%) were from Africa (**Table 1**).

Table 1. General characteristics of the patients

	Number (n)	Percentage (%)
Age (mean±SD)	50 ± 22	
Gender		
Female	2056	42.8
Male	2743	57.2
Total	4799	100
Nationality		
Turkish	4622	96.3
Syrian	144	3
European	8	0.2
Asian	16	0.3
African	9	0.2
Total	4799	100

The positivity rates in the patients included in the study were 2% (n=95) for Anti HAV IgM and 3.3% (n=159) for Hbs Ag. Anti HBc IgM 0.5% (n=26). 1.2% (n=57) for anti HCV. For HIV Ag/Ab Combo it was 0.6% (n=27). When the differences between the sexes were examined, the rate of HbsAg positivity was found to be statistically significantly higher in men than in women (4%, 2.5%) (p=0.001). No gender difference was found between other markers (**Table 2**).

Table 2. Viral markers measured by ELISA method and their distribution by gender

	Gender		Total	p
	Female	Male		
Anti HAV IgM				0.107
Negative	2023 (98%)	2681(98%)	4704 (98%)	
Positive	33 (2%)	62(2%)	95 (2%)	
Total	2056 (42.8%)	2743 (57.2%)	4799 (100%)	
HBSAg				0.001
Negative	2008 (97.7%)	2632 (96%)	4640(96.7%)	
Positive	48 (2.3%)	111 (4%)	159 (3.3%)	
Total	2056 (100%)	2743 (100%)	4799 (100%)	
Anti HBc IgM				0.212
Negative	2048 (99.6%)	2725 (99.3%)	4773 (99.5%)	
Positive	8 (0.4%)	18 (0.7%)	26 (0.5%)	
Total	2056 (100%)	2743 (100%)	4799 (100%)	
Anti HCV				0.076
Negative	2717 (99.1%)	2025 (98.5%)	4742 (98.8%)	
Positive	26 (0.9%)	31 (1.5%)	57 (1.2%)	
Total	2743 (100%)	2056 (100%)	4799 (100%)	
HIV Ag/Ab combo				0.541
Negative	2046 (99.5%)	2726 (99.4%)	4772 (99.4%)	
Positive	10 (0.5%)	17 (0.6%)	27 (0.6%)	
Total	2056 (100%)	2743 (100%)	4799 (100%)	

Considering the differences according to the nationalities of the patients included in the study, Anti HCV positivity was found in Turkish Residents. It was found to be significant in nationals compared to others (p <0.001). Positive and negative rates by nationality are given in **Table 3**.

Table 3. Viral markers measured by ELISA method and their distribution by nationality

	Nationality						
	Turkish	Syrian	European	Asian	African	Total	p
Anti HAV IgM							0.138
Negative	4534 (94.5%)	137 (2.9%)	8 (0.2%)	16 (0.3%)	9 (0.2%)	4704 (98%)	
Positive	88 (1.8%)	7 (0.1%)	0 (0%)	0 (0%)	0 (0%)	95 (2%)	
Total	4622 (96.3%)	144 (3%)	8 (0.2%)	16 (0.3%)	9 (0.2%)	4799 (100%)	
HBSAg							0.080
Negative	4468 (93.1%)	142 (3%)	8 (0.2%)	14 (0.3%)	8 (0.2%)	4640 (96.7%)	
Positive	154 (3.2%)	2 (0%)	0 (0%)	2 (0%)	1 (0%)	159 (3.3%)	
Total	4622 (96.3%)	144 (3%)	8 (0.2%)	16 (0.3%)	9 (0.2%)	4799 (100%)	
Anti HBS IgM							0.993
Negative	4597 (95.8%)	143 (3%)	8 (0.2%)	16 (0.3%)	9 (0.2%)	4773 (99.5%)	
Positive	25 (0.5%)	1 (0%)	0 (0%)	0 (0%)	0 (0%)	26 (0.5%)	
Total	4622 (96.3%)	144 (3%)	8 (0.2%)	16 (0.3%)	9 (0.2%)	4799 (100%)	
Anti HCV							<0.001
Negative	4572 (95.3%)	139 (2.9%)	8 (0.2%)	14 (0.3%)	9 (0.2%)	4742 (98.8%)	
Positive	50 (1%)	5 (0.1%)	0 (0%)	2 (0%)	0 (0%)	57 (1.2%)	
Total	4622 (96.3%)	144 (3%)	8 (0.2%)	16 (0.3%)	9 (0.2%)	4799 (100%)	
HIV Ag/Ab Combo							0.904
Negative	4595 (95.7%)	144 (3%)	8 (0.2%)	16 (0.3%)	9 (0.2%)	4772 (99.4)	
Positive	27 (0.6%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	27 (0.6)	
Total	4622 (96.3%)	144 (3%)	8 (0.2%)	16 (0.3%)	9 (0.2%)	4799 (100%)	

When positivity rates were compared according to their diagnosis, Anti HAV IgM positivity was found to be statistically significant in hemodialysis patients compared to other diagnoses (p <0.001). No significant difference was found between other markers and indications. (**Table 4**).

Considering the rate of positivity in the tests taken before the emergency operation, incidentally; Anti HAV IgM 1.3% (n=42) Hbs Ag 3.2% (n=102), Anti HBc IgM 0.4% (n=13), Anti HCV 1% (n=33), HIV Ag/Ab Combo 0.3% (n =11).

DISCUSSION

Emergency services are units that provide health care 24 hours a day without any interruption, concern many different disciplines, where patients are admitted at the first application or by referral from another health center, and the exact diagnosis of the patients is mostly unknown at the first stage. Despite the gradual increase in risk groups in communicable diseases and the precautions taken against transmission routes, the incidence of these diseases is still increasing (5).

The first unit that welcomes patients in cases of threats that are noticed or detected for the first time is the emergency services. In this case, the importance of emergency service physicians and managers to take the necessary precautions emerges. Patients and health personnel working in emergency departments where continuous health services are provided are constantly at risk of some infectious diseases (6,7). This situation has also come to the fore in the COVID-19 case we have experienced in recent years (8). Despite these known facts, it was observed in the study that the number of applications by the health personnel in the emergency department of our hospital was very low. The low number of occupational accidents shows that the educational and practical process in in-service training and prevention methods is successful.

However, the prevalence of being positive was found to be compatible with the prevalence of the population in patients who applied to the emergency department and did not have active complaints for infectious diseases and were requested to have hepatitis and HIV serology tests (4,9). The proportions of patients who were taken in this cross-sectional preoperative or unexplained condition and found to be positive vary between 1.4% and 0.4%. Although these rates show that the ministry of health is working effectively in public health, it is of great importance that newly detected cases are directed to appropriate treatment in order to prevent new transmissions.

The fact that the number of patients included in the study was 4799 and the female-male ratios were equal, we think that it is generally adaptable for a cross-sectional study. Considering the immigration status from foreign countries for the last 5 years, it is observed that the patients who applied to the emergency department did not differ much in terms of sociodemographic nationality.

Except for the Hbs Ag positivity rate (males are statistically more numerous), there is no statistical difference between the sex ratios in other markers. Similar results were found in other studies (10).

Table 4. Leading search reasons in serology examinations

	Anti HAV IgM		HBsAg		Anti HBc IgM		Anti HCV		HIV Ag/Ab		Total
	Neg n (%)	Pos n (%)	Neg n (%)	Pos n (%)	Neg n (%)	Pos n (%)	Neg n (%)	Pos n (%)	Neg n (%)	Pos n (%)	n (%)
Acute viral hepatitis	167 (97.1%)	5 (2.9%)	166 (96.5%)	6 (3.5%)	171 (99.4%)	1 (0.6%)	170 (98.8%)	2 (1.2%)	171 (99.4%)	1 (0.6%)	172 (100%)
LFT Augmentations	820 (96.1%)	33 (3.9%)	821 (96.2%)	32 (3.8%)	845 (99.1%)	8 (0.9%)	837 (98.1%)	16 (1.9%)	843 (98.8%)	10 (1.2%)	853 (100%)
Gallbladder diseases	95 (100%)	0	94 (98.9%)	1 (1.1%)	94 (98.9%)	1 (1.1%)	93 (97.9%)	2 (2.1%)	94 (98.9%)	1 (1.1%)	95 (100%)
Preoperative	3130 (98.7%)	42 (1.3%)	3070 (96.8%)	102 (3.2%)	3159 (99.6%)	13 (0.4%)	3139 (99%)	33 (1%)	3161 (99.7%)	11 (0.3%)	3172 (100%)
Hemodialisis	183 (95.3%)	9 (4.7%)	188 (97.9%)	4 (2.1%)	191 (99.5%)	1 (0.5%)	191 (99.5%)	1 (0.5%)	189 (98.4%)	3 (0.6%)	192 (100%)
Endoskopy	224 (97.4%)	6 (2.6%)	219 (95.2%)	11 (4.8%)	228 (99.4%)	2 (0.9%)	228 (99.1%)	2 (0.9%)	229 (99.6%)	1 (0.4%)	230 (100%)
Malignity	13 (100%)	0	13 (100%)	0	13 (100%)	0	13 (100%)	0	13 (100%)	0	13 (100%)
Cirrhosis	26 (100%)	0	26 (100%)	0	26 (100%)	0	26 (100%)	0	26 (100%)	0	26 (100%)
Work accident	29 (100%)	0	28 (96.6%)	1 (3.4%)	29 (100%)	0	28 (96.6%)	1 (3.4%)	29 (100%)	0	29 (100%)
Substance abuse	17 (100%)	0	15 (88.2%)	2 (11.8%)	17 (100%)	0	17 (100%)	0	17 (100%)	0	17 (100%)
p value*	<0.001		0.373		0.843		0.578		0.177		

Considering the differences according to nationalities, Anti HCV positivity T.C. It was found to be significant in nationals compared to others (p <0.001), but it is controversial whether it is clinically significant due to the large differences between the number of patients in the groups compared. More research is needed on this subject.

CONCLUSION

This study has data that can reflect the society in terms of the place where it was conducted and the number of patients included in the study. With the sensitivity of the Ministry of Health on the subject and the impact of the intensive work of the primary care on vaccination, we have found satisfactory results in terms of transmission and vaccination.

Limitations

The most important limitation of this study is that it did not include all patients who applied to the emergency department, but only those who were requested to be tested. Second important limitation of this study is that its an retrospectiv studies. Study was conducted through patient records.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of the İzmir Kâtip Celebi University Non-Invasive Clinical Research Ethics Committee (Date: 21.04.2022 -Decision No: 0188).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

REFERENCES

1. Global Viral Hepatitis: Millions of People are Affected | CDC [Internet]. 2021 [cited 12 August 2022]. Availible from: https://www.cdc.gov/hepatitis/global/index.htm
2. World Health Organization. (2017). Global hepatitis report 2017. World Health Organization. https://apps.who.int/iris/handle/10665/255016. License: CC BY-NC-SA 3.0 IGO
3. IN DANGER: UNAIDS Global AIDS Update 2022. Geneva: Joint United Nations Programme on HIV/ AIDS; 2022. Licence: CC BY-NC-SA 3.0 IGO.
4. HIV-AIDS İstatistik [İnternet]. [cited12 August 2022]. Available from: https://hsgm.saglik.gov.tr/tr/bulasici-hastaliklar/hiv-aids/hiv-aids-liste/hiv-aids-istatislik.html
5. Tabak, Ö. F., & Özaras, R., (2008). Toplumdan Edinilmiş Enfeksiyonlara Pratik Yaklaşımlar . İstanbul: İstanbul Üniversitesi Cerrahpaşa Tıp Fakültesi Sürekli Tıp Eğitimi Etkinlikleri.
6. Güney SB, Köksal Ö, Durak VA. Acil Servis çalışanlarının delici kesici aletler ile yaralanmaları ve önleme yöntemlerinin i ̇ncelenmesi. Uludağ Tıp Derg. 2017; 43(1): 1-5.
7. Saygun M. Occupational Health and Safety Problems in Health Workers. TAF Prev Med Bull. 2012;11(4):373.
8. Çalışkan Pala S. , Metintas S. COVID-19 Pandemi ̇ si ̇ nde Sağlik Çalişanlar ESTÜDAM Halk Sağlığı Derg 2020; 5: 156-168.
9. Türkiye Viral Hepatit Önleme ve Kontrol Programı [Internet] 2021 [cited 11 August 2022]. Available from: https://hsgm.saglik.gov.tr/tr/bulasicihastaliklar-haberler/turkiye-viral-hepatit-onleme-ve-kontrol-programi.html
10. Baş B. Hepatit B prevalansı ve aile içi bulaşım yolları. Akademik Gastroenteroloji Derg 2017; 16(1): 12-17.