



Hepatitis A Seroprevalence and Factors Affecting Hepatitis A Vaccination Among Healthcare Workers in a University Hospital

Bir Üniversite Hastanesinde Sağlık Çalışanlarında Hepatit A Seroprevalansı ve Hepatit A Aşılmasını Etkileyen Faktörler

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ABSTRACT

Objectives: Although there is an effective and valid vaccine, hepatitis A is an important public health problem, especially in underdeveloped countries. Ensuring high vaccination rates can help reduce the burden of hepatitis A. The aim of our study was to investigate hepatitis A seroprevalence, vaccination status, and barriers to vaccination among healthcare professionals.

Materials and Methods: This is a cross-sectional descriptive study. The study was carried out in the Staff Health Screening Outpatient Clinic of Mengücek Gazi Training and Research Hospital, and the hepatitis A immunoglobulin G (IgG) results of 226 people included in the study were evaluated. A 20-question questionnaire prepared by the researchers, which scanned the participants' occupations, hepatitis infection status, coronavirus and hepatitis A vaccination status, barriers to vaccination, and their relationship with primary care physicians, was filled in by face-to-face interview method.

Results: The mean age was 30.02. Anti-hepatitis A virus IgG value was positive in 65.5% (n=148) of the participants. Only 36.7% (n=83) of the participants had previously been vaccinated against hepatitis A. The biggest obstacle to vaccination was the lack of time with 32.1% (n=46). Hepatitis A vaccination rate of physicians were statistically significantly higher than the others (p=0.018). The communication of the participants with their family physicians positively affected the vaccination rates positively (p=0.001).

Conclusion: The vaccination rate among healthcare workers was relatively low, indicating the need for increased efforts to improve

ÖZ

Amaç: Etkili ve geçerli bir aşı olmasına rağmen hepatit A özellikle az gelişmiş ülkelerde önemli bir halk sağlığı sorunudur. Yüksek aşılanma oranlarının sağlanması, hepatit A yükünün azaltılmasına yardımcı olabilir. Çalışmamızın amacı, sağlık çalışanları arasında hepatit A seroprevalansını, aşılanma durumunu ve aşılanma engellerini araştırmaktır.

Gereç ve Yöntemler: Bu, kesitsel tanımlayıcı bir çalışmadır. Çalışma Mengücek Gazi Eğitim ve Araştırma Hastanesi Personel Sağlık Tarama Polikliniği'nde gerçekleştirildi ve 226 kişi çalışmaya dahil edildi. Katılımcıların hepatit A immünoglobulin G (IgG) sonuçları hastane sisteminden değerlendirildi. Katılımcıların mesleklerini, hepatit enfeksiyon durumlarını, koronavirüs ve hepatit A aşılanma durumlarını, aşılanmadaki engelleri ve birinci basamak hekimleri ile ilişkilerini tarayan, araştırmacılar tarafından hazırlanan 20 soruluk anket yüz yüze görüşülerek dolduruldu.

Bulgular: Yaş ortalaması 30,02 idi. Anti-hepatitis A virüs IgG değeri katılımcıların %65,5'inde (n=148) pozitif. Katılımcıların sadece %36,7'si (n=83) daha önce hepatit A aşısı olmuştu. %32,1 (n=46) ile aşılanmanın önündeki en büyük engel zaman yetersizliği idi. Hekimlerin hepatit A aşılanma oranları diğerlerine göre istatistiksel olarak anlamlı derecede yüksekti (p=0,018). Katılımcıların aile hekimleri ile iletişimi aşılanma oranlarını olumlu yönde etkiledi (p=0,001).

Sonuç: Sağlık çalışanları arasında aşılanma oranının nispeten düşük olması, aşılanma oranlarını iyileştirmek için daha fazla çaba

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vaccination rates. At this stage, family physicians should take a more active role in public health.

Keywords: Hepatitis A, hepatitis A vaccines, seroprevalence, vaccination

gösterilmesi gerektiğini göstermektedir. Bu aşamada aile hekimleri toplum sağlığı açısından daha aktif rol almalıdır.

Anahtar Kelimeler: Hepatit A, hepatit A aşıları, seroprevalans, aşılama

Introduction

Hepatitis A virus (HAV) is an RNA virus belonging to the picornavirus family and the hepatovirus genus (1). It is a significant public health problem in developing countries and countries with low socio-economic status and is directly linked to poor sanitation and socio-economic conditions (2). HAV is transmitted through contaminated food, water or close contact with an infected person (3). The clinical course of HAV infection tends to be milder in children, but it can become more severe with age (4,5). Due to properties such as being disinfectants-resistant and heat, HAV is highly contagious and can survive for long periods outside the body (3). Symptoms may persist for months after the resolution of the infection because HAV can be transmitted through the fecal-oral route for a long time (6). Despite the availability of safe and effective vaccine, HAV continues to play a significant role in the etiology of acute viral hepatitis (3).

According to the World Health Organization (WHO), although the global incidence of hepatitis A has decreased significantly over the past two decades, with an estimated 1.4 million cases reported in 2018, HAV remains the most common form of acute hepatitis worldwide (7). It is believed that the actual incidence of HAV infection is much higher than reported. HAV infection, usually subclinical, anicteric, or icteric, can cause significant morbidity, even if it does not become chronic. In rare cases, fulminant hepatitis can occur, which can lead to high mortality (8). Complications are more common when infection occurs at an older age (4). In terms of seroprevalence, the rates of hepatitis A vary widely depending on the population being studied. In general, the prevalence of hepatitis A antibodies (indicating past infection or vaccination) tends to be higher in countries with lower socio-economic status and poorer sanitation. Poor hygiene practices and crowded living conditions increase the likelihood of transmission (1).

The importance of hepatitis A vaccination cannot be overemphasized. Hepatitis A can cause serious illness, including liver failure and death, and most cases occur in unvaccinated individuals. In addition, outbreaks of hepatitis A can have a significant impact on public health because it can quickly spread in close-knit communities or settings with inadequate hygiene practices. The WHO recommends that all children receive the hepatitis A vaccine as part of their routine childhood immunization schedule (9). However, vaccination rates vary widely worldwide, with coverage range from less than 10% in some countries to above 90% in others (10).

The hepatitis A vaccine is safe, effective and provides long-lasting immunity, and it is recommended for individuals at increased risk of contracting the virus. Ensuring high vaccination rates can help reduce the burden of hepatitis A and protect both individual and public health. WHO reduces the incidence of hepatitis A by 90% by 2030 and increasing vaccination rates is vital to this effort (10).

Our study investigated the seroprevalence of hepatitis A and vaccination status among healthcare workers, who are role models for the community in the health field.

Materials and Methods

This is a retrospective cross-sectional descriptive study. The study was conducted between 01.01.2022 and 01.11.2022 in Erzincan Mengücek Gazi Training and Research Hospital Personnel Health Screening Polyclinic. The research population consists of allied health personnel and physicians working in Erzincan Mengücek Gazi Training and Research Hospital whose hepatitis markers have been checked in the last 6 months.

Although 890 people applied to the polyclinic, hepatitis serology was not requested from health workers who were not in risky groups due to the procedure (medical secretaries, hospital security, patient transport personnel etc.). Hepatitis serology was requested from approximately 450 people. Those who had deficiencies in their analyses and those who did not accept participating in the study were excluded. Without performing a sample calculation, we tried to reach all the patients and reached 226 patients.

The results of hepatitis A immunoglobulin G (IgG) checked in the past six months for the participants were evaluated from the hospitals information management system. The presence of anti-HAV antibodies in serum samples collected from patients has been investigated using a chemiluminescent microparticle immunoassay method. When interpreting the results, samples with values below 1 S/CO were considered negative and samples with ≥ 1 S/CO were considered positive.

Written informed consent forms were obtained from healthcare personnel who met the inclusion criteria for the study and agreed to participate. The researchers prepared a questionnaire consisting of 20 questions that screened for the participants' occupations, hepatitis infection status, coronavirus (COVID) and hepatitis A vaccination status, barriers to vaccination, and relationships with primary care physicians. The questionnaire was filled out using face-to-face interviews.

Approval for the study was obtained from the Erzincan Binali Yıldırım University, Clinical Research Ethics Committee (approval number: 2022/07-86, date: 06.06.2022). The procedures were followed to comply with the ethical standards of this committee responsible for human experimentation and the principles of the Declaration of Helsinki as revised.

Statistical Analysis

The data were entered into the IBM SPSS Statistics 23 (SPSS, Chicago, IL) package program, and descriptive statistics, chi-square test, Mann-Whitney U test, and Student's t-tests were performed. The statistical significance level was taken as $p < 0.05$.

Results

The average age of the 226 people included in the study was 30.02 (minimum: 19, maximum: 55), the average number of siblings was 2.97 (minimum: 0, maximum: 13) and the average number of children was 0.62. (minimum: 0, maximum: 4). Other demographic data of the participants are given in Table 1.

96.4% (n=218) of the participants had at least one dose of the coronavirus disease-2019 (COVID-19) vaccine (mean: 2.75±1.05). The most preferred combination was the 2 Sinovac 1 Biotech combination with 27% (n=61). 25.2% (n=57) of the participants preferred only Sinovac, 22.6% (n=51) only Biotech, and 48.7% (n=110) both vaccines.

The hepatitis A and hepatitis A vaccination status of the participants are given in Table 2.

The relationship between being vaccinated against hepatitis A and gender, occupation, educational status, presence of hepatitis patients in the same household, presence of chronic diseases, and being vaccinated against COVID-19 are given in the Table 3.

The relationship between the anti-HAV IgG values of the participants and age groups, gender, education level, presence of hepatitis patients at home, COVID vaccination status, and previous hepatitis A is given in Table 4.

The relationship between the communication levels of the participants with their family physicians and the vaccination variables is given in the Table 5.

Discussion

HAV is an RNA virus that belongs to the picornavirus family and is a significant public health problem, particularly in developing countries, due to poor sanitation and socio-economic conditions. The hepatitis A vaccine is safe, effective and provides long-lasting

immunity, and it is recommended for individuals at increased risk of contracting the virus. This study investigated the seroprevalence of hepatitis A and vaccination status among healthcare workers at the Mengücek Gazi Training and Research Hospital in Turkey.

The hepatitis A vaccine on the World Health Organization List of Essential Medicines was first approved in Europe in 1991 and in the United States in 1995 (11). In Turkey, the hepatitis A vaccine was introduced as part of the national immunization program in 1998. Since then, it has been consistently administered to children and adults at high risk of infection, including travelers to countries with high rates of hepatitis A, healthcare workers, and individuals with liver disease. It was included in the expanded immunization program in November 2012 (12).

HAV seroprevalence is decreasing in Turkey because of the inclusion of the vaccine in the national immunization program and improved socio-economic conditions (13,14). Although there are positive decreases, Turkey is still in the middle endemic region regarding HAV infection. In middle endemic areas, HAV infection usually coincides with adolescence and early adulthood, and its prevalence increases with age, as expected. In our study, it was observed that anti-HAV IgG positivity increased significantly with increasing age.

Although Turkey is located in the middle endemic region, there are also regional differences due to its wide geographical structure. For example, while anti HAV IgG positivity was found to be 10,18%

	n	%
Gender		
Man	91	40.3
Woman	135	59.7
Duty		
Nurse	111	49.1
Doctor	58	25.7
Other allied health personnel	57	25.2
Education		
Primary-secondary school	9	4.0
High school	22	9.7
University and above	195	86.3
The presence of chronic disease		
Yes	28	12.4
No	198	87.6
Presence of patients with hepatitis in the same household		
Yes	18	8
No	208	92

	n	%
Anti-HAV IgG positivity		
Positive	148	65.5
Negative	78	34.5
Have you ever had hepatitis A?		
Yes	40	17.7
No	186	82.3
Have you had the hepatitis A vaccine?		
Yes	83	36.7
No	143	63.3
If it was vaccinated, where was it?		
Family health center	29	34.9
Hospital	47	56.6
Other	7	8.4
Would you consider getting the hepatitis A vaccine if you do not?		
Yes	47	32.8
No	54	37.3
I'm undecided	42	29.3
The biggest obstacle to vaccination		
The lack of time	46	32.1
The lack of information	27	18.8
The fear of side effects	31	21.6
Other	39	27.2

HAV: Hepatitis A virus, IgG: Immunoglobulin G

in a study conducted in Izmir, this rate was found to be 90,3% in another study conducted in Şırnak (15,16). In a study by Kutlu et al. (17) on dentistry students in the Central Anatolian region, this rate was found to be 24.9%. In our study, this rate was determined to be 65.5%, and it can be said that there is an average positivity.

Considering the hepatitis A vaccination status although the population of our study consisted of health professionals, vaccination rates were quite low (63.3%). In a study conducted by Bolatkale et al. (18) with 402 people in our country, it was seen that 86.6% of the participants had not had the hepatitis A vaccine before. Although the rates are better, it is expected that the vaccination rates of health professionals who should be role models to society will be much better.

The study also identified several barriers to hepatitis A vaccination among healthcare workers. When questioned about the barriers to getting the vaccine, they included lack of time, lack of awareness about the importance of vaccination, and concerns about the safety and efficacy of the vaccine. These barriers highlight the need for improved education and vaccine access for healthcare workers.

On the other hand, there was no significant relationship between hepatitis A vaccination status and gender, education, presence of hepatitis at home, presence of chronic disease, and COVID-19 vaccination status. There was only a significant

relationship between occupation and hepatitis A vaccination status. The percentage of vaccination was higher in physicians in other healthcare professionals, and this level was statistically significant. This could be due to various factors, including differences in access to vaccination, knowledge about the importance of vaccination, or personal beliefs about vaccination. It is also possible that physicians may be more likely to encounter hepatitis A in their work and may therefore have a greater incentive to be vaccinated.

Our study found a significant relationship between age groups and anti-HAV IgG in accordance with the literature (6,8,13,19). Since the probability of encountering hepatitis A infection increases with age, positivity was higher at later ages. However, no significant relationship was found between gender, occupation, education, having hepatitis at home, and preferences for the COVID vaccine. Although the vaccination rates of allied health personnel are quite low, relatively high antibody positivity is an exciting finding. This may be related to hepatitis A infection in childhood to low socioeconomic conditions.

It is likely that the relationship between other healthcare workers and family physicians could play a role in determining hepatitis A vaccination rate. Family physicians are often the primary point of contact for individuals seeking medical care, and they can play a crucial role in educating patients about the importance of

Table 3. Relationship between being vaccinated against hepatitis A and gender, occupation, educational status, presence of hepatitis patients in the same household, presence of chronic diseases, and being vaccinated against COVID-19

	The status of hepatitis A vaccination					p
	Yes		No		Total	
	n	%	n	%		
Gender						
Man	38	41.8	53	58.2	91	0.198
Woman	45	33.3	90	66.7	135	
Duty						
Nurse	37	33.3	74	66.6	111	0.018
Doctor	30	51.7	28	48.3	58	
Other allied health personnel	16	28.0	41	72.0	57	
Education						
Primary-secondary school	2	22.2	7	77.8	9	0.281
High school	11	50	11	50	22	
University and above	70	35.9	125	64.1	195	
Presence of patients with hepatitis in the same household						
Yes	3	16.7	15	83.3	18	0.066
No	80	38.5	128	61.5	208	
The presence of chronic disease						
Yes	9	32.1	19	67.9	28	0.591
No	74	37.3	124	62.7	198	
COVID vaccination status						
None	1	12.5	7	87.5	8	0.143
Only Sinovac	25	43.9	32	56.1	57	
Only Biotech	14	27.5	37	72.5	51	
Both of them	43	39.0	67	61.0	110	

vaccination and helping them access vaccines. Therefore, a positive relationship between healthcare workers and family physicians may be beneficial in promoting vaccination among healthcare workers. This could include collaborating on education and outreach efforts and coordinating vaccine delivery and administration.

Study Limitations

Our study has some strengths and weaknesses. Although participants' vaccination information and medical records have been reviewed, there may still be incomplete records (especially if it has been ten years or more since vaccination). In these cases, the answers given by the participants were accepted as correct. Although the participants are generally a group with high health literacy, some deficiencies may exist. In this respect, it may be considered in the future to conduct a study only with participants whose medical records are up-to-date.

On the other hand, there are many studies on hepatitis seroprevalence in the literature but few on vaccination rates, especially in the hepatitis A vaccine. Although there are many studies on hepatitis B vaccination in the literature, less attention may be given to hepatitis A vaccinations, probably because they are seen as more harmless and included in vaccination programs later. In this respect, our study is a study that can contribute to the literature. However, the fact that the study was conducted only on health workers can be considered a shortcoming. There is a need for advanced community-based studies that include primary care.

Conclusion

Overall, the study found that the seroprevalence of hepatitis A and the vaccination rate among healthcare workers in Mengücek Gazi Training and Research Hospital in Turkey were relatively low,

Table 4. Relationship between the anti-HAV IgG values of the participants and age groups, gender, education level, presence of hepatitis patients at home, COVID vaccination status, and previous hepatitis A

	Hepatitis A IgG positivity					p
	Positive		Negative		Total	
	n	%	n	%	n	
Age groups						
19-24	28	52.8	25	47.2	53	0.022
25-27	34	60.7	22	39.3	56	
28-32	39	67.2	19	32.8	58	
33-55	47	79.6	12	20.4	59	
Gender						
Woman	86	63.7	49	36.3	135	0.492
Man	62	68.1	29	31.9	91	
Duty						
Nurse	75	67.5	36	32.5	111	0.771
Doctor	36	62.0	22	38.0	58	
Other allied health personnel	37	64.9	20	35.1	57	
Education						
Primary-secondary school	9	100	0	0	9	0.085
High school	14	63.6	8	36.4	22	
University	125	64.1	70	35.9	195	
Do you have patients with hepatitis in your home?						
Yes	12	66.6	6	33.3	18	0.913
No	136	65.3	72	34.7	208	
Have you had COVID vaccine?						
Yes	142	65.1	76	34.9	218	0.564
No	6	75	2	25	8	
Which COVID vaccine						
Only Sinovac	37	65	20	35	57	0.640
Only Biontech	30	58.8	21	41.2	51	
Both of them	75	68.1	35	31.9	110	
Passing hepatitis A						
Yes	38	95	2	5	40	0.001
No	110	59.1	76	40.9	186	

HAV: Hepatitis A virus, IgG: Immunoglobulin G, COVID: Coronavirus

Table 5. Relationship between the participants' communication levels with their family physicians and vaccination variables										
	Communication level with family physicians									p
	Very bad-bad		Intermediate		Good		Excellent		Total	
	n	%	n	%	n	%	n	%	n	
Have you been informed about vaccinations by your family physician?										
Yes	0	0	12	14.4	35	42.1	36	43.3	83	0.001
No	13	12.8	47	46.5	41	40.5	13	12.8	101	
Partly	1	0.4	9	42.8	11	52.3	8	38	21	
Have you been vaccinated against hepatitis A?										
Yes	2	2.4	21	25.3	27	32.5	33	39.8	83	0.001
No	12	8.4	47	32.9	60	42	24	16.7	143	
If there were vaccine, where did it happens?										
Family Health Center	0	0	8	27.6	7	24.1	14	48.2	29	0.022
Hospital	2	4.2	11	23.4	18	38.2	16	34.0	47	
Other	0	0	2	28.5	2	28.5	3	42.9	7	
The biggest obstacle to vaccination										
The lack of time	3	10.7	15	53.6	5	17.9	5	17.9	28	0.009
The lack of information	4	14.8	9	33.3	7	25.9	7	25.9	27	
The fear of side effects	1	5.5	11	61.0	3	16.6	3	16.6	18	
Other	4	11.7	12	5.9	9	26.4	9	26.4	34	

indicating a need for increased efforts to improve vaccination rates and protect healthcare workers from hepatitis A infection. This could include improved education about the importance of vaccination, increased access to the vaccine, and efforts to address concerns about the safety and efficacy of the vaccine.

Ethics

Ethics Committee Approval: Approval for the study was obtained from the Erzincan Binali Yıldırım University, Clinical Research Ethics Committee (approval number: 2022/07-86, date: 06.06.2022).

Informed Consent: Retrospective study.

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Authorship Contributions

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