

Attitudes About Hepatitis A Vaccine and Vaccine-associated Side Effects among Turkish Medical Students

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Abstract

Objective: Although medical students are not determined as health care workers worldwide, they are commonly exposed to some infectious agents such as hepatitis A virus. Therefore, it is important to assess their perceptions of the hepatitis A vaccine. In this study, we aimed to assess the attitudes of Turkish medical students about hepatitis A vaccine and vaccine-associated side effects.

Material and Methods: The study was performed on 103 medical students with age between 20 and 26. All the students vaccinated by the same nurse at Hacettepe University Pediatric Infectious Diseases Unit in December and answered a questionnaire and follow-up form.

Results: The mean student age was 21.69 ± 0.97 years. Pain with movement (58.3%) and pain with touch (38.8%) were the most common side effects at the vaccination site. Despite the side effects, all the vaccinated students wanted to receive the following dose of vaccine. Twelve of the vaccinated students (11.7%) indicated that the major reason of their vaccination was the recommendation of a pediatric infectious disease specialist. One of the major reasons for not wishing vaccination was the cost of vaccine for the 60 of them (58.3%).

Conclusion: The cost of vaccine may be important for receiving hepatitis A vaccination for medical students. A vaccine recommended by infectious diseases specialist may influence the decision of getting vaccinated. (*J Pediatr Inf 2015; 9: 20-4*)

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Introduction

Hepatitis A virus (HAV) infection is a self-limited and vaccine-preventable disease. Most infections in children aged 6 years are asymptomatic, whereas those in older children and adults are usually symptomatic (1, 2). Transmission happens usually via the fecal-oral route through contaminated food and water. Turkey is a country in transition for hepatitis A transmission. As access to clean water and sanitation improves, transmission decreases and an increasing proportion of young adults have not been exposed to hepatitis A, creating a public health problem. Paradoxically, this factor is responsible for increasing the number of susceptible adults within the population (3-5).

Health care workers (HCW) are exposed to various types of infectious agents in occupational settings, including those caused by HAV (6, 7). The main modes of HAV transmission are contact of an infected patient with staff, food-borne infection, infection through invasive procedures, and infusion of HAV-contaminated blood products. These routes make HAV a potential occupational risk for health care workers (8-10). During training, medical school students have the potential to come in contact with patients infected by HAV. The seroprevalence for anti-HAV Ig G of medical school students is low, particularly in those under age 30 (11). One of the interventions for preventing the acquisition of the diseases is appropriate immunization (12). Vaccination may become important in the occu-



pational health strategy for protecting susceptible HCW populations because of dramatically changing HAV epidemiology in the last decades, leading to a significant number of unprotected adults from the infection. In this context, a better understanding of the knowledge and perception of the disease by the population or by certain groups is critical before launching prevention programs and vaccination campaigns.

Health personnel are at risk of exposure to hepatitis A virus; therefore, it is important to assess their perceptions of the hepatitis A vaccine. In this study, we conducted a survey amongst medical students in Turkey to assess their attitudes toward the vaccine and willingness to receive hepatitis A vaccine. We also hypothesized that pediatrician with subspecialty affiliation as infectious diseases would be more supportive of the vaccine acceptability.

Material and Methods

In December 2011, 103 fourth (first clinical education year) and sixth (internal ship) year medical students at Hacettepe University Faculty of Medicine voluntarily participated in this study. The total number of fourth and sixth year students was 840. Hepatitis A serology was seronegative in almost half of the students. After the confirmation of anti-HAV Ig G status was negative, it is announced that the inactivated hepatitis A vaccine (Havrix®) has been supplied with half of the market price by a local supplier. All the seronegative students have been contacted and offered to vaccinate. The vaccine was intramuscularly administered to students at a dose of 1440 mcg/1.0 mL duration of the 2nd and 3rd week of December in the Department of Pediatric Infectious Diseases, Hacettepe University Faculty of Medicine. The students were advised that their participation was voluntary, and each student provided an informed consent. Each subject was asked to complete a questionnaire and follow-up form. The form comprised patient data, including self-recordings of temperature, side effects including local, and systemic and severe adverse events for 7 days.

Questionnaire

All participants completed a structured questionnaire that assessed the attitudes and practices of medical students regarding hepatitis A immunization. Questionnaire included the following questions: question 1, If another department recommends this vaccine, do you accept it?; question 2, If you have to pay as much as the market price for this vaccine, do you accept it?; question 3, If you had a side effect, do you accept the second dose of vaccine?; question 4, Do you recommend this vaccine to your family members and also friends despite the side effects?;

question 5, Do you agree that hepatitis A vaccine should be a part of the childhood immunization?

Statistical Analysis

Data were analyzed using SPSS version 19.0 (SPSS, Inc., Chicago, IL, USA). Descriptive statistics were used to summarize participant baseline characteristics, including means, standard deviations (SDs), medians, and interquartile ranges for continuous variables and frequency distributions for categorical variables.

Results

In December 2011, 103 (103/840) fourth- and sixth-year medical students were enrolled in this study. These participants were 67 (65%) females and 36 (35%) males. The mean student age was 21.69 ± 0.97 years (range, 20-26 years). The vaccine was administered to the right deltoid in 24 (23.3%) medical students and left deltoid in 79 (76.7%) (reverse of the preferred hand).

There were no serious adverse events in our study. Complaints associated with the injected site predominated; pain with movement (58.3%) and pain with touch (38.8%) were the most common side effects of the vaccination site that did not interfere with their everyday activities. Fifteen medical students (14.6%) had systemic symptoms, including fever, chills, and appetite (Table 1).

According to questionnaire, 12 (11.7%) of our students believed that if a pediatrician, particularly a pediatric infectious disease specialist recommends this vaccine, it will be safer for them. The cost of vaccination was also stated as one of the major reason to not be vaccinated for 60 (58.3%) of the students. They said that a discounted vaccine price affected their decision for vaccination. All the medical students said that they would get the second dose of vaccine, and 93 (90.3%) of them will recommend this vaccine to their close contacts, such as their family members and friends, regardless of the local or systemic side effects. Fifty-seven students (55.3%) wanted the hepatitis A vaccine to be a part of childhood immunization (Figure 1).

Discussion

Hepatitis A is a widespread infectious disease. The seropositivity of hepatitis A in the 20–30-year-old population differed from 69% to 85% in various studies, indicating a shift in HAV seroprevalence from the younger to the higher age groups in recent years of Turkey (4, 5, 13, 14). Medical students represent a group within the susceptible adults. Health care workers (HCW) and health science students are commonly exposed to some infectious agents, such as HAV (15-17). Although there are many

unanswered questions about occupational risk and long-term implications of infection by HAV, it is clear that infections with this virus may cause substantial morbidity and even death. As medical students are exposed to blood and body fluids in many procedures at a high rate, they are prone to hepatitis A infection, like the other infectious disease (18-20). The most common procedure performed by the students was drawing blood, with an average frequency of 60.8/month. Sixty-one per cent of the students reported that they were injured during the various procedures, and only 35.5% of them used gloves (21). Furthermore, the hepatitis A vaccine was not a member of National Immunization Programme (NIP) in Turkey at the study period and was recently implemented into the Turkish NIP. Therefore, many students wanted to be vaccinated with hepatitis A according to our recommendations. According to the questionnaire, 12 (11.7%) of our students believed that our recommendation as a pediatric infectious disease specialist is more important than the other physicians. The thoughts of the students may reflect the opinions of other health professionals. We believe that our vigilance will be important for the vaccination of the medical students in a hospital setting.

There is no doubt a vaccine recommended by such specialists, including pediatricians, may influence the decision to be vaccinated (22, 23). In the past, immunization program worldwide have mainly focused on the infant and early childhood vaccines. More recently, awareness has increased about the value of adolescence and adult immunization (24). At this point, a pediatric infectious disease specialist should be involved in recommending the vaccine to adults. However, the following challenges are increasing. a) Most physicians, who will be recommending HAV vaccines, may not have an awareness of the seroprevalence shift to the higher ages and still consider HAV vaccine as a member of childhood immunization. b) The HAV vaccine not seems

to be an indication for HCW in Recommended Adult Immunization Schedule by Centers for Disease Control and Prevention (25). It will be an opportunity for catch-up immunization if we assess the immunization status of medical students while working with them in clinics.

In 1982, Viranuvatti et al. (26) reported that anti-HAV antibodies were present in 73% of second- and third-year medical students. In 1992, Poovorawan et al. (27) found HAV seroprevalence as 30% in fifth-year medical students, aged 20–21 years in Thailand. Chatchatee et al. (3) reported a marked decline in the HAV seroprevalence of fourth- and fifth-year medical students from the same country. There are few reports about the HAV seroprevalence of medical students in Turkey. Oncu et al. (18) reported the prevalence of anti-HAV Ig G was 64% with a high susceptibility of medical students and their increased risk of clinical HAV in Turkey. Considering their age and seroprevalence, medical students are at a high risk of nosocomial acute HAV infection. The immunization status, beliefs, and attitudes of students may be underestimated in our usual medical practices. The screening of medical students for seropositivity and vaccination of the non-immune students may have been important during the medical clerkship. Accordingly, the

Table 1. Side Effects

Side effects	No. (%)
	Local side effects
Pain with movement	60 (58.3%)
Pain with touch	40 (38.8%)
Redness	6 (5.8%)
Swelling	5 (4.9%)
	Systemic side effects
Fever	5 (4.9%)
Chills	9 (8.7%)
Loss of appetite	1 (1 %)

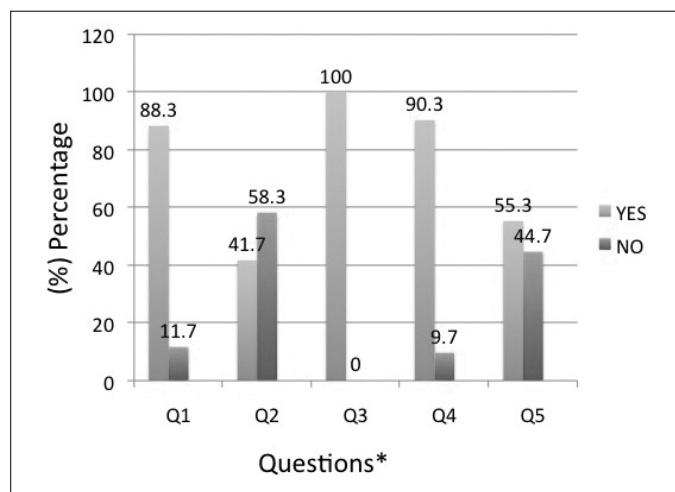


Figure 1. Attitudes of the medical students to immunization of hepatitis A

* **Question 1:** If another department recommends this vaccine, do you accept it?

Question 2: If you have to pay as much as the market price for this vaccine, do you accept it?

Question 3: Despite the side effects, do you accept the second dose of vaccine?

Question 4: Do you recommend this vaccine to your family members and also friends despite the side effects?

Question 5: Do you agree that the hepatitis A vaccine should be a part of the childhood immunization?

occupational risk and shift of clinical HAV seroprevalence with increasing age, it is important to encourage the medical students to get vaccinated against hepatitis A and the other vaccine-preventable disease.

The cost of vaccination is around 35 US dollars for 2 doses, and this was one of the major reasons for not getting vaccinated in our study. Kara et al. (28) reported that HCW seems more likely to be vaccinated if the vaccine was provided without cost and during the subject's working hours. The attitude of the medical students was the same.

Since 1980s, the hepatitis A vaccine has been extensively studied in individuals of all ages and has been known to be safe, immunogenic, and well-tolerated (29-31). All medical students said that they will get the second dose of vaccine, and also 93 (90.3%) of them will recommend this vaccine to their close contacts, such as their family members and friends, regardless of local or systemic side effects. In our study, the experience of side effects is not a prominent factor affecting personal decisions for second dose vaccination and also recommendation to other persons. All the reported side effects were relatively minor, and almost all of them were local. They strongly emphasized that they will get the second-dose vaccine despite the side effects. The main reason of their belief was that hepatitis A is a vaccine-preventable disease.

Conclusion

Although medical students are not determined as in HCW worldwide, they are commonly exposed to some infectious agents, such as HAV, particularly in mild-endemic regions, which may cause substantial morbidity and even deaths with an increasing age. Recommending vaccination may have provided a chance to protect them as occupational risks in hospital settings. Pediatricians may be a part of increasing the awareness of the goals of NIP because of the attitudes of adults or risky groups are that the immunization is the concern of the pediatricians. The vaccination cost should not be a reason to not be vaccinated in this risky group. Mass immunization should be considered to tackle this issue in medical schools, particularly those in countries where the hepatitis A vaccine is not a part of childhood immunization.

Ethics Committee Approval: Ethics committee approval was not received due to the nature questionnaire based study.

Informed Consent: Written informed consent was obtained from all the volunteers in the present study.

Peer-review: Externally peer-reviewed.

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References

1. Hadler SC, Webster HM, Erben JJ, Swanson JE, Maynard JE. Hepatitis A in day-care centers. A community wide assessment. *N Engl J Med* 1980; 302: 1222-7. [\[CrossRef\]](#)
2. Benenson MW, Takafuji ET, Bancroft WH, Lemon SM, Callahan MC, Leach DA. A military community outbreak of hepatitis type A related to transmission in a child care facility. *Am J Epidemiol* 1980; 112: 471-8.
3. Chatchatee P, Chongsrisawat V, Theamboonlers A, Poovorawan Y. Declining Hepatitis A seroprevalence among medical students in Bangkok, Thailand, 1981-2001. *Asian Pac J Allergy Immunol* 2002; 20: 53-6.
4. Ceran N, Yüksel Kocdogan F, Mert D, et al. Hepatitis A seroprevalence in children and young adults in Istanbul, Turkey: seroprevalence change and associated factors. *J Viral Hepat* 2012; 19: 72-6. [\[CrossRef\]](#)
5. Kurugol Z, Aslan A, Turkoglu E, Koturoglu G. Changing epidemiology of hepatitis A infection in Izmir, Turkey. *Vaccine* 2011; 29: 6259-61. [\[CrossRef\]](#)
6. Smith S, Weber S, Wiblin T, Nettleman M. Cost-effectiveness of hepatitis A vaccination in healthcare workers. *Infect Control Hosp Epidemiol* 1997; 18: 688-91. [\[CrossRef\]](#)
7. Lerman Y, Chodik G, Aloni H, Ribak J, Ashkenazi S. Occupations at increased risk of hepatitis A: a 2-year nationwide historical prospective study. *Am J Epidemiol* 1999; 150: 312-20. [\[CrossRef\]](#)
8. Ciocca M. Clinical course and consequences of hepatitis A infection. *Vaccine* 2000; 18: 71-4. [\[CrossRef\]](#)
9. Chodick 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: 414-20. [\[CrossRef\]](#)
10. Park JY, Lee JB, Jeong SY, Lee SH, Lee MA, Choi HJ. Molecular characterization of an acute hepatitis A outbreak among healthcare workers at a Korean hospital. *J Hosp Infect* 2007; 67: 175-81. [\[CrossRef\]](#)
11. Kim S, Lee JH, Hwang JH, Lee CS. Hepatitis A antibody seroprevalence among medical school students. *Am J Infect Control* 2011; 39: 889-90. [\[CrossRef\]](#)
12. Bonanni P, Bonaccorsi G. Vaccination against hepatitis B in health care workers. *Vaccine* 2001; 19: 2389-94. [\[CrossRef\]](#)
13. Erdoğan MS, Otkun M, Tatman-Otkun M, Akata F, Türe M. The epidemiology of hepatitis a virus infection in children, in Edirne, Turkey. *Eur J Epidemiol* 2004; 19: 267-73.
14. Atabek ME, Fyndyk D, Gulyuz A, Erkul I. Prevalence of anti-HAV and anti-HEV antibodies in Konya, Turkey. *Health Policy* 2004; 67: 265-9. [\[CrossRef\]](#)

15. Grzeszczuk A, Sokolewicz-Bobrowska E, Chlabicz S. Occupational risk of hepatitis A infection among health care providers in northeastern Poland. *Med Sci Monit* 2003; 9: PH11-4.
16. Vranckx R, Jacques P, Moens G. Prevalence of hepatitis A antibodies in a large sample of Belgian health care workers. *Infection* 1999; 27: 256-8. [\[CrossRef\]](#)
17. Members of the student health services at academic medical centers task force. Blood-borne, pathogen disease in health science students: recommendations from the Lexington conference, November 6-7, 2000. *J Am Coll Health* 2001; 50: 107-20. [\[CrossRef\]](#)
18. Oncu S, Oncu S, Sakarya S. Hepatitis A and B seropositivity among medical students. *Health Policy* 2005; 74: 39-45. [\[CrossRef\]](#)
19. Hofmann F, Wehrle G, Berthold H, Koster D. Hepatitis A as an occupational hazard. *Vaccine* 1992; 10: 82-4. [\[CrossRef\]](#)
20. Shen C, Jagger J, Pearson RD. Risk of needle stick and sharp object injuries among medical students. *Am J Infect Control* 1999; 27: 435-7. [\[CrossRef\]](#)
21. Varma M, Mehta G. Needle stick injuries among medical students. *J Indian Med Assoc* 2000; 98: 436-8.
22. Ishibashi KL, Koopmans J, Curlin FA, Alexander KA, Ross LF. Pediatricians are more supportive of the Human Papillomavirus vaccine than the general public. *South Med J* 2008; 101: 1216-21. [\[CrossRef\]](#)
23. Ramet J, Ezzo van D, Meszner Z. Position paper - HPV and the primary prevention of cancer; improving vaccine uptake by paediatricians. *Eur J Pediatr* 2011; 170: 309-21. [\[CrossRef\]](#)
24. Mackroth MS, Irwin K, Vandelaer J, Hombach J, Eckert LO. Immunizing school age children and adolescents: experience from low- and middle-income countries. *Vaccine* 2010; 28: 1138-47. [\[CrossRef\]](#)
25. Centers for Disease Control and Prevention. Recommended adult immunization schedule-United States, 2012. *J Midwifery Womens Health* 2012; 57: 188-95. [\[CrossRef\]](#)
26. Viranuvatti V, Hemindra P, Chainuvati T. Anti-HAV in Thai population. *J Med Assoc Thailand* 1982; 65: 379-82.
27. Poovorawan Y, Theamboonlers A, Chumdermpadetsuk S. Changing seroepidemiology of hepatitis A virus infection in Thailand. *Southeast Asian J Trop Med Public Health* 1993; 24: 250-4.
28. Kara A, Devrim I, Celik T, et al. Influenza vaccine adverse event and effect on acceptability in pediatric residents. *Jpn J Infect Dis* 2007; 60: 387-8.
29. Clemens R, Safary A, Hepburn A, Roche C, Stanbury WJ, Andre FE. Clinical experience with an inactivated hepatitis A vaccine. *J Infect Dis* 1995; 171: 44-9. [\[CrossRef\]](#)
30. Furesz J, Scheipele DW, Palkonyay L. Safety and effectiveness of the new inactivated hepatitis A virus vaccine. *CMAJ* 1995; 152: 343-8.
31. Zhang ZL, Zhu XJ, Wang X, et al. Interchangeability and tolerability of two inactivated hepatitis A vaccines in Chinese children. *Vaccine* 2012; 30: 4028-33. [\[CrossRef\]](#)