CLINICAL CHALLENGE

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# Iraq: A Hot Zone for HAV Infection?

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***Case Presentation:*** **A 25 year-old man referred to our center with symptoms compatible with acute hepatitis for the past two weeks. He was a government employee and had married two months before. We evaluated his lab test and while we were waiting for his lab test result, he called us to say that his wife had the same symptoms. We visited her and found that the clinical picture was compatible with the acute hepatitis, too. It was really interesting for us to see acute presentation in a husband and his wife simultaneously. We asked them about important risk factors like history of transfusion, recent surgery, tattooing, and addiction, all of which were negative. They mentioned that they had a trip to Karbala in Iraq one month before. Afterwards, we received their lab data showing: ALT and AST more than 10 times of upper limit of normal range, elevation in direct bilirubin, HBsAg negative, HBcAb IgM negative, HCV Ab by Eliza test negative and HAV Ab IgM positive. During follow up, fortunately, the symptoms and signs improved and they lived happily ever after! The question is: "should we consider the trip to Iraq a risk factor for acquiring acute HAV infection?"**

## Introduction

Hepatitis A virus (HAV) is a major global public health problem especially in developing countries[1]. This is primarily due to its fecal-oral route of transmission, which allows it to spread rapidly when conditions such as living in crowded places, substandard sanitation facilities, and inadequate water supplies coexist. In these countries, most infections occur under the age of 10 and majority of these infections are asymptomatic[2]. In contrast, the seroprevalence in several industrialized countries in pediatric ages are low and infection is usually acquired during late adolescence and early adulthood and accompanies with significant morbidity[3]. The severity of acute hepatitis A increases with age. Most infections that occur in children younger than age 6 are asymptomatic, and jaundice is rare. Infections in older children and adults are usually symptomatic, with the majority exhibiting jaundice[4,5]. Complications increase significantly in adults with mortality rate of up to 2.1% in patients more than 40 years. Infections with HAV don't lead to chronic disease and induce lifelong immunity.

## Mode of Transmission

The virus replicates in liver, is excreted in the bile and is found in high concentrations in stool, mainly during the late incubation period and the first week of clinical illness. Symptoms of vomiting and diarrhea may enhance transmission. Fecal shedding of HAV can last for months after resolution of symptoms, and such patients could be a source of further viral spread in the community. Because of the high titers in stool, HAV is transmitted predominantly by fecal-oral route through close personal contact (often between family members and sexual contacts) or ingestion of contaminated food, water, milk and uncooked shellfish (e.g., clams, mussels, and oysters) from contaminated water are a common source. Many large epidemics have been caused by eating shellfish. The most likely mode of transmission will depend on the HAV endemicity in each area. In areas with very high and high endemicity, the modes of transmission are person to person, through contaminated food and water, and outbreaks. In areas with intermediate endemicity, infection transmits through person-to-person, outbreaks and through contaminated food or water. In low and very low endemicity areas, common source outbreaks, exposure during travel to

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high endemicity areas, and uncommon sources are the most common routes of disease transmission[3].

## Worldwide Disease Pattern

The prevalence and pattern of clinical disease also differs in geographic areas with the age at which transmission predominates. It depends on socioeconomic, hygienic and sanitary conditions of each geographic area. HAV is found worldwide with the highest prevalence in regions with low standards of sanitation, where asymptomatic infections occur early in life. As sanitation standards improve, exposure is reduced; thus increasing the risk of acquiring HAV if exposed later in life when the clinical course can be more complicated. Spread is more common in overcrowded areas with poor hygiene and poor sanitation. In highly endemic areas that are in least developed countries with poor sanitary and hygienic conditions, including parts of Africa, Asia, Central America, and South America, the prevalence of anti-HAV is almost universal by 5 years of age. The HAV infection is often asymptomatic and reported symptomatic disease rates are low and outbreaks of disease are rare. The travelers from developed countries to these areas are at high risk of infection. Sanitation and hygienic conditions are good in developed countries, and infection rates in children are generally low. Hepatitis A accounts for 20-25% of clinical hepatitis in developed world.

As countries develop and socioeconomic conditions improve, overall endemicity of infection decreases and anti-HAV seroprevalence and disease patterns may change. The surveys from Greece, Japan, Iceland, Italy, Hong Kong and Thailand showed that the overall prevalence and age-specific prevalence of anti-HAV have decreased and reported rate of clinical hepatitis A has increased over time. It is due to shift in the average age of infection to one at which clinical illness is more common. Although some countries in the Middle East appear to remain high endemic regions, shifting HAV epidemiology in this region has also been documented.

## Middle East and Central Asia

HAV infection is endemic in Middle East countries, but unfortunately there are not enough data regarding countries in Central Asia. There are great differences between not only the different countries in the Middle East, but also different regions in the same country in terms of the epidemiology of HAV infection. The epidemiology of HAV infection in any subgroups of Iranian population is not properly known as seroprevalence studies are lacking. In a study among children visited in pediatric hospitals of Tehran, the prevalence rate was 22.3% and it seems that HAV infection is not highly prevalent in our population. A report from Shiraz in south of Iran, the rate of seroprevalence was 68% among 15-year-olds, and correlated with mean number of household members[5]. The intermediate prevalence of HAV infection in this study may be related to widespread availability of chlorinated water and indoor plumbing to people living in Tehran, the capital of Iran.

The data from Qatar showed that by the age of 30 years, all individuals were anti-HAV positive although at ages 15 to 19 years, only 64% were anti-HAV positive. Qatar is thus a country of intermediate endemicity for HAV infection. The data from United Arab Emirates showed, by the age of 17-20 years, about 60% of the sampled population had anti-HAV antibody. In Israel, 54% of 18-year-olds were anti-HAV positive. The overall prevalence of anti-HAV antibodies in children aged six months to 15 years was 29.3%. The prevalence rates in refugee Kurds from Iraq and Turkey were 94.4%. The prevalence rate in Syrian population was 89%, with 50% in the 1-5 years age group and 95% in the 11-15 years age group. The prevalence rate in Palestine was 93.7%. The data from Saudi Arabia is different. In a study from Eastern part of country, hepatitis A prevalence was 3% for pre-school age, 80% in older children and 93% in adults, while total prevalence was 86%. In the second study, by 11 years of age, only 45% were anti-HAV positive. The data confirms the hypothesis that there is a significant decrease in seroprevalence of anti-HAV in Saudi Arabia. Similar changes in seroprevalence of hepatitis A had occurred in children and adolescents in Turkey whose population has anti-HAV antibody from 34.2% to 65.8%.

In conclusion, the Middle East countries are at least intermediate for HAV infection prevalence. Recent data from some countries from Middle East had shown the shifting pattern from high to intermediate or low endemicity of HAV infection. However, a number of foci of endemicity remain which alarm us regarding prevention of new cases in adults who travel to those regions.

## Discussion

USA-Iraq war on top of economic sanction deteriorated the socioeconomic situation of Iraqi people, hence predisposing them to low sanitation

and hygiene and as a result, prone to more all fecal-oral infections. On the other hand, Iran has been improving both in socioeconomy and hygiene throughout these years. Iranian people are enjoying quite high level of hygiene in most parts of the country especially in urban areas. Iranian Shiite Moslems enthusiastically visit the holy cities of Iraq while majority of them have not been exposed to HAV infection. Iraq is a high endemic area for this infection; as a result, Iranian pilgrims are susceptible to be infected with HAV. Considering the age of pilgrims, the severity of the disease and its course will be worse than those for younger people. That is why I would like to draw your dear attention to the following recommendations:

- Pilgrims must be informed of the possibility of HAV infection and the ways to prevent it.
- Authorities of such pilgrim expeditions should be required to provide pilgrims with decent water and food supply.
- Pilgrims, especially those of urban areas, ought to be required to have an immunoglobulin anti-HAV shot before traveling to Iraq.
- While Zam Zam water in Mecca is hygienic, the water in Iraqi holy places is most probably contaminated and a probable source of HAV infection, so pilgrims must be warned against drinking such water before boiling it.

## References


1. Hollinger FB, and Ticehurst JR. Hepatitis A virus. In: Fields BN, Knipe DM, and Howley PM, eds. Fields Virology, 3rd ed. Philadelphia, Lippincott - Raven, 1996:735-82
2. Sheila Sherlock & James Dooley. Diseases of the Liver and Biliary System, 11th edition, Blackwell Publishing. 2002:273-6
3. World health Organization web site, Communicable Disease Surveillance & Response (CSR) Hepatitis A: Prevention and Treatment
4. Sohn YM, Rho HO, Park MS, Park JH, Choi BY, Ki M, Jang WI. The changing epidemiology of hepatitis A in children and the consideration of active immunization in Korea. *Yonsei Med J* 2000;**41**:34-9
5. Alborzi P, Alborzi AV, Boub R, Amoateng Y. Hepatitis A seroprevalence in Iranian children: implications for post-exposure prophylaxis. 41st annual meeting of IDSA. October 9-12, 2003. San Diego
6. Mehr AJ, Ardakani MJ, Hedayati M, Shahraz S, Mehr EJ, Zali MR. Age-specific seroprevalence of hepatitis A infection among children visiting pediatric hospitals of Tehran, Iran. *Eur J Epidemiol* 2004; **19**:275-8
7. Acharya SK, Batra Y, Bhatkal B, Ojha B, Kaur K, Hazari S, *et al*. Seroepidemiology of hepatitis A virus infection among school children in Delhi and north Indian patients with chronic liver disease: implications for HAV vaccination. *J Gastroenterol Hepatol* 2003; **18**:822-7
8. Saberifiroozi M, Serati AR, Taghvaee T, Marooofi GR, Shirazi KM. Prevalence of hepatitis A virus antibodies in patients with chronic liver disease in Shiraz, Iran. *Indian J Gastroenterol* 2005; **24**:33-4
9. Shapiro CN, Coleman PJ, McQuillan GM, Epidemiology of hepatitis A: sero-epidemiology and risk groups in the USA. *Vaccine* 1992; 10 Suppl **1**:S59-62
10. Poovorawan Y. Changing epidemiology and prevention of hepatitis A virus infection. *Zhonghua Min Guo Xiao Er Ke Yi Xue Hui Za Zhi*. 1998;**39**:139-45
11. Marks PJ, Fey RE, Parry JV, Deakin D, Carlisle D, Neal KR.Use of hygiene advice and active immunisation to control an outbreak of hepatitis A. *Commun Dis Public Health*. 2001; **4**:158-62
12. Mosley JW, Reisler DM, Brachott D *et al*. Comparison of two lots of immune serum globulin for prophylaxis of infectious hepatitis. *Am J Epidemiol* 1968;**87**:539-50
13. Zamir C, Rishpon S, Zamir D, Leventhal A, Rimon N, Ben-Porath E. Control of a community-wide outbreak of hepatitis A by mass vaccination with inactivated hepatitis A vaccine. *Eur J Clin Microbiol Infect Dis*. 2001;**20**:185-7
14. Sonder GJ, van Steenbergen JE, Bovee LP, Peerbooms PG, Coutinho RA, van den Hoek A.Hepatitis A virus immunity and seroconversion among contacts of acute hepatitis A patients in Amsterdam, 1996-2000: an evaluation of current prevention policy. *Am J Public Health*. 2004;**94**:1620-6
15. Irwin DJ, Millership S.Control of a community hepatitis A outbreak using hepatitis A vaccine. *Commun Dis Public Health*. 1999;**2**:184-7
16. Crowcroft NS, Walsh B, Davison KL, Gungabissoon U; PHLS Advisory Committee on Vaccination and Immunisation.Guidelines for the control of hepatitis A virus infection. *Commun Dis Public Health*. 2001;**4**:213-27.
17. Prikazsky V, Olear V, Cernoch A, Safary A, Andre FE. Interruption of an outbreak of hepatitis A in two villages by vaccination. *J Med Virol*. 1994; **44**:457-9
18. Monica Preboth ACIP Recommendations for the Prevention of Hepatitis A through Immunization. American Family Physician, Vol. 61/No. 7 (April 1, 2000)
19. Richtmann R, Chaves RL, Mendonca JS, Konichi SR, Mitre HP, Takei K, Dietz K, Flehmig B.Immunogenicity and efficacy of a killed hepatitis A vaccine in day care center children. *J Med Virol*. 1996;**48**:147-50
20. Poovorawan Y. Changing epidemiology and prevention of hepatitis A virus infection. *Zhonghua Min Guo Xiao Er Ke Yi Xue Hui Za Zhi*. 1998; **39**:139-45
21. Canada Communicable Disease Report Vol. 26 (ACS-4) 1 July 2000
22. Kanda D, Takagi H, Hashimoto Y, M, Takayama H, Takahashi H, Abe T, Takezawa J, Mori M. Severe manifestation of acute hepatitis A recently found in Gunma, Japan. *J Gastroenterol*. 2002;**37**:517-22
23. Prikazsky V, Olear V, Cernoch A, Safary A, Andre FE. Interruption of an outbreak of hepatitis A in two villages by vaccination. *J Med Virol*. 1994; **44**:457-9
24. Severo CA, Abensur P, Buisson Y, Lafuma A, Detournay B, Pechevis M. An outbreak of hepatitis A in a French day-care center and efforts to combat it. *Eur J Epidemiol*. 1997;**13**:139-44.
25. Crowcroft NS, Walsh B, Davison KL, Gungabissoon U; PHLS Advisory Committee on Vaccination and Immunisation.Guidelines for the control of hepatitis A virus infection. *Common Dis Public Health*. 2001;**4**:213-27
26. Bonanni P, Colombai R, Franchi G, Lo Nostro A, Comodo

N, Tiscione E. Experience of hepatitis A vaccination during an outbreak in a nursery school of Tuscany, Italy. *Epidemiol Infect*. 1998;**121**:377-80
27. Arce Arnaez A, Rodero Garduno I, Inigo Martinez J, Burgoa Arenales M, Guevara Alemany E. Hepatitis A outbreak in a day care center and household transmission. *An Pediatr* (Barc). 2004; **60**:222-7
28. Bownds L, Lindekugel R, Stepak P. Economic impact of a hepatitis A epidemic in a mid-sized urban community: the case of Spokane, Washington. *Community Health* 2003;**28**:233-46
29. D'Argenio P, Adamo B, Cirrincione R, Gallo G. The role of vaccine in controlling hepatitis A epidemics, *Vaccine* 2003; **21**:2246-9
30. Boyles S. Day care setting ideal place for vaccination, *Vaccine Wkly* 1996; **22**; 14-5
31. Wang X, Ma J, Xu Z, Liu H, Zhang Y, Han C. Effectiveness of post-exposure prophylaxis using live attenuated hepatitis Alpha vaccine (H(2) strain) among schoolchildren. *Zhonghua Yi Xue Za Zhi*. 2002; **82**: 955-7
32. Kaic B, Borcic B, Ljubicic M, Brkic I, Mihaljevic I.Hepatitis A control in a refugee camp by active immunization. *Vaccine* 2001; **19**: 3615-9
33. John TJ, Chandy GM. What priority for prevention of hepatitis A in India? *Indian Journal of Gastroenterology*. 1998; **17**: 2-3
34. Chadha MS, Chitambar SD, Shaikh NJ, Arankalle VA Exposure of Indian children to hepatitis A virus & vaccination age. *Indian J Med Res*. 1999; **109**: 11-5
35. Stuart JM, Majeed FA, Cartwright KA, Room R, Parry JV, Perry KR, Begg NT. Salivary antibody testing in a school outbreak of hepatitis A. *Epidemiol Infect*. 1992; **109**: 161-6
36. Bonanni P, Franzin A, Staderini C, Pitta M, Garofalo G, Cecconi R, Santini MG, Lai P, Innocenti B. Vaccination against hepatitis A during outbreaks starting in schools: what can we learn from experiences in central Italy? *Vaccine* 2005 **18**; 23: 2176-80
37. David AM; the Steering Committee for Prevention and Control of Infectious Diseases. Hepatitis A outbreaks--methods of intervention in South-East Asian countries. *Int J Infect Dis*. 2004; **8**:201-9
38. Smith PF, Grabau JC, Werzberger A, *et al*. The role of young children in a community wide outbreak of hepatitis A. *Epidemiol Infect*. 1997; **118**:243-52
39. Syed NA, Hearing SD, Shaw IS, Probert CS, Brooklyn TN, Caul EO, Barry RE, Sarangi J. Outbreak of hepatitis A in the injecting drug user and homeless populations in Bristol: control by a targeted vaccination programme and possible parenteral transmission. *Eur J Gastroenterol Hepatol*. 2003; **15**: 901-6