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ORIGINAL ARTICLE

The epidemiological pattern of acute viral hepatitis in Tehran and Zahedan: A comparison study

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ABSTRACT

Aim: The aim of this study was to identify and compare the pattern of acute viral hepatitis in two regions of Iran.

Background: The epidemiological pattern of acute hepatitis varies across the Globe depending on geographic region, health status, socioeconomic conditions and differences in exposure to etiological factors.

Patients and methods: A cross-sectional study was carried out among 357 cases of acute viral hepatitis referring to the hepatitis centers in Tehran (n = 109) and Zahedan (n = 248) during 2003-2004. All patients were tested against Anti-HAV IgM, HBsAg, HCV and HDV antibody by enzyme linked immunosorbent assay (ELISA). Specific viral cause of hepatitis and demographic characteristics of patients were compared between the two populations.

Results: Study participants in Zahedan were significantly younger than those in Tehran (11.4±9.63 years vs. 31.0±10.76; P< 0.05). The proportion of male participants in Tehran was considerably higher compared to Zahedan (86.2% vs. 52%; P< 0.05). In Tehran, HBV (62%) and HCV (15%) were the most frequent type of hepatitis, while in Zahedan, HAV (72%) and HBV (18%) were the most common type of hepatitis.

Conclusion: The present study showed a discrepancy in morbidity pattern of acute hepatitis between the two regions of Iran. This variability may be due to differences in socioeconomic status and environmental risk factors for the acquisition of the different types of hepatitis. Therefore, regional information about viral hepatitis is needed in order to direct and evaluate prevention and control activities.

Keywords: A*cute viral hepatitis, Tehran, Zahedan.*

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INTRODUCTION

According to the center for disease control and prevention, the prevalence of acute viral hepatitis has been increasing during the past two decades. Worldwide, a total of 60000 cases of acute viral hepatitis were reported in 1985. In the United States, one out of every 4000 persons suffers from acute viral hepatitis (1).

Furthermore, a low annual report of acute hepatitis should not be misinterpreted as a low prevalence of viral hepatitis infection. Most infections with acute hepatitis occur asymptomatically, so they are not

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detected and reported to the surveillance system. Consequently, some studies suggest that the true number of acute viral hepatitis is 5 to 8 times higher than the reported number of the disease (2-4).

Additionally, acute viral hepatitis is a potentially life-threatening liver infection. It can cause chronic liver disease and can put people at high risk of death from cirrhosis of the liver and liver cancer. Overall, the mortality rate of acute viral hepatitis is 1%, but the risk of dying from the disease increases with age (2).

There is also a large disparity in morbidity pattern of acute hepatitis across the Globe depending on geographic region, socioeconomic conditions and risky behaviours. For example, the highest cases rate of hepatitis A occurs in regions with low standards of sanitation. Conversely, hepatitis B infections are common in areas with frequent unprotected sexual activity and drug injection. This is further evidenced by data from studies which indicates discrepancy in epidemiological pattern of the disease in different parts of Iran and/or the world (5-9).

Moreover, this pattern may change over the time due to the temporal variations in aetiological risk factors. For instance, a morbidity trend based on cases reported to a hospital in Sweden shows a shift in incidence of reported cases of hepatitis for a period of 25 years. During this time, no change occurred in the reported incidence of hepatitis A, while there were increases in the reported incidence of hepatitis non-A, non-B, following increasing prevalence of injecting drug use among individuals. There was also a decline in the age of morbidity and the proportion of female patients (6).

Most of the previous studies that have investigated the pattern and causes of acute hepatitis have been conducted in populations from the western societies. Besides, those studies were predominantly conducted during 1975-1985. Consequently, there is insufficient data about this disease among populations from lower- and middle-income countries including Iran in recent years. Therefore, understanding the epidemiology of morbidity of acute viral hepatitis is required to update previous studies and to provide regional information. The purpose of the current study was to identify and compare the pattern of morbidity of acute viral hepatitis in two regions of Iran (Tehran in the centre and Zahedan in southeast of Iran).

PATIENTS and METHODS

A cross-sectional study was carried out among cases of acute viral hepatitis referring to the hepatitis centers in Theran (n= 109) and Zahedan (n= 248) during 2003-2004. Individuals who reported a history of acute hepatitis were not included in this study.

All patients were tested against Anti-HAV IgM, HBsAg, HCV and HDV antibody by enzyme linked immunosorbent assay (ELISA), using commercially available reagents. Then, acute viral hepatitis was classified as hepatitis A (presence of Anti-HAV IgM), hepatitis B (presence of HBsAg), hepatitis C (presence of HCV RNA) and hepatitis D (presence of Anti-HDV & HBsAg).

A confirmed case of acute viral hepatitis was one that met the following criteria:

A) The presence of hepatitis symptoms including: weakness, lethargy, early fatigue, joint pains, jaundice (yellow skin) and stomach pain;
B) elevated liver enzymes;
C) positivity of serological markers in acute phase of HAV, HBV, HCV and HDV;
D) absence of nonviral causes of hepatitis such as toxic/drug-induced hepatitis, hemolytic syndrome and fatty liver;
E) evidence of acute hepatitis in liver biopsy.

The relative frequency was used to clarify the prevalence of the four types of hepatitis by age-group and site. The quantitative data were presented as mean ± SD. Data were analysed using chi-square test for categorical variables and t-test for continuous

variables. *P* value (α) of < 0.05 was considered significant.

RESULTS

A total of 357 (70% in Zahedan) cases of acute viral hepatitis were included in this analysis. Study participants in Zahedan were significantly younger than those in Tehran (11.4±9.63 years vs. 31.0±10.76 years; P< 0.05). The sex distribution was also different between the two regions (P< 0.05); the proportion of male participants in Tehran was 86.2%, whereas corresponding value was 52% for Zahedan. The relative frequencies of hepatitis cases are shown by type, region and age-group in table 1. These percentages reflect a substantial difference in geographical distribution of hepatitis (P< 0.05).

Table 1. Cases of viral hepatitis by type and age-group

Age-group (Yrs)	Type	Tehran (%)	Zahedan (%)
< 10			
	HAV	----	90
	HBV	------	6
	HCV	------	1
	HDV + HBV	-----	----
10 - 20			
	HAV	----	71
	HBV	23	20
	HCV	69	5
	HDV + HBV	-----	2
20 - 30			
	HAV	2	24
	HBV	58	47
	HCV	13	6
	HDV + HBV	2	3
30 - 40			
	HAV	-----	----
	HBV	71	80
	HCV	21	20
	HDV + HBV	4	
40 - 50			
	HAV	----	------
	HBV	67	50
	HCV	22	50
	HDV + HBV	7	----
Total			
	HAV	4	72
	HBV	65	18
	HCV	15	3
	HDV + HBV	4	2

In Tehran, HBV was the most frequent (62%) type of hepatitis, followed by HCV (15%), whereas HAV and HDV were seen in small numbers of persons (4%). In comparison, HAV was the most common type (72%) of hepatitis in Zahedan, followed by HBV (18%).

DISCUSSION

The present study showed important differences in the epidemiological patterns of acute viral hepatitis between the two regions of Iran. In Tehran, HBV was responsible for nearly two-thirds (62%) of all cases of viral hepatitis, whereas the data from Zahedan reflect that HAV is the leading cause of hepatitis accounting for 72% of all recorded cases (7).

Importantly, the results of the current study are not consistent with studies conducted in other countries. In 2003, a study in Pakistan showed that the most prevalant cases of viral hepatitis are due to HEV (44%) and HBV (30%) (10). However, based on a report from Saudi Arabia the major types of hepatitis were HAV (41%), non-A and non-B (38%) and HBV (21%) (11). Similarly, HAV (47%), HBV (41%) and non-A and non-B (12%) were reported as the most important types of hepatitis in a study carried out in Portugal (12). Likewise, two separate studies in Germany and Greece identified HAV, HBV and non-A and non-B as the most frequent types of hepatitis. During 1976-1977 a study in Washington ordered cases of viral hepatitis as follow: 52% as HBV; 22%, as HCV; 20%, as HAV and 4% as hepatitis HDV (5, 13, 14).

The variability in the prevalence of hepatitis might be explained by differences in socioeconomic status and environmental risk factors for the acquisition of the different types of hepatitis. For example, recently a study in Tehran indicated an important change in the pattern of viral hepatitis over a period of three years. During this span of time, the incidence of hepatitis A

began to decline, whilst the incidence of hepatitis B remained unchanged. The decline in the incidence of HAV may be the result of public heath actions and improvement in awareness of inhabitants about transmission routs of the disease.

Furthermore, our findings suggest that cases of acute hepatitis are younger in Zahedan compared with those from Tehran. The possible explanation for the age differences could be the fact that HAV is common among children and young adults, while HBV infection is lowest in children and young adults under 19 years of age. This in turn may be another reason for disparity in the pattern of hepatitis between two regions in Iran, also, different countries across the Globe.

The present study has clear public health implications. Preventive measures for viral hepatitis should focus on risk factors associated with acquiring HAV and HBV infections in Zahedan and Tehran, respectively. The main interventional recommendations that need to be implemented in Zahedan include health promotion, improvements in living conditions and sanitation. In Tehran, efforts must be strengthened to inform society about transmission routes of HBV and vaccinate individuals with high-risk behaviors (sexual activity and using drug injection).

There are some limitations that warrant the discussion. The morbidity pattern of HEV has not been assessed in this study. Additionally, data summarized in this report are based on cases of symptomatic manafestations. However, to our knowledge it is the first study to compare the pattern of acute viral hepatitis in two different geographical regions with relatively sufficient sample size.

In conclusion, the results of this study in line with previous epidemiological studies confirm the discrepancy in the prevalence of viral hepatitis markers among different population groups. Therefore, regional information about viral hepatitis is needed to direct and evaluate prevention and control activities.

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