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Letter to the editor

Seroprevalence of hepatitis A immunity among children and adolescents in two cities of the Triângulo Mineiro region, state of Minas Gerais, Brazil

Dear Editor,

Hepatitis A (HA) is a global disease whose incidence is closely associated with the development of a region, and there is an inverse relationship between its endemicity patterns and the population's socioeconomic level.[1] Several developing countries worldwide have changed their endemicity patterns from high to intermediate and from intermediate to low, as a result of improvements in hygiene, sanitation conditions, and in the quality of drinking water.[2]

In Brazil, changes in HA endemicity patterns from high to intermediate have occurred in some regions, but not in others.[3] The differences in seroprevalences among regions probably result from the socioeconomic and sanitation conditions found in these regions.[4] The present study aimed to assess the prevalence of antibodies against HA in two cities of the state of Minas Gerais, and to associate it with socioeconomic and environmental conditions.

This cross-sectional study was conducted in the cities of Uberlândia (604,013 inhabitants) and Limeira do Oeste (6,890 inhabitants), two of the 35 cities situated in the western area of the state of Minas Gerais, known as Triângulo Mineiro. Data collection was performed between May 2010 and May 2011. Students aged between 7-18 years and enrolled in public schools were randomly selected and divided according to gender and age (7-10 years; 11-14 years; and 15-18 years). In Limeira do Oeste, students of the two schools situated in the urban area participated; in Uberlândia, students of two central schools and two peripheral schools participated, and these schools were randomly selected.

Serum total anti-HAV antibodies were determined by the ELISA method (Abbott, AXSYM HAVAB 2.0 – Wiesbaden, Germany) and the following data were collected: highest level of education among responsible adults, monthly household income in minimum wages, presence of a resident with a history of hepatitis, number of bathrooms in the home, number of residents, number of rooms, resident-room ratio, presence of water filter, presence of treated water supply, type of sewage disposal, and type of garbage disposal. Three students who had been vaccinated against HA were not included in this study.

The chi-squared test or Fisher's exact test were used to compare the frequencies of anti-HAV results. Univariate and multivariate analyses were used to assess the association between the presence of anti-HAV antibodies and the variables studied. A p-value ≤ 0.05 was considered significant. Informed consent was obtained from the adults responsible for each of the participating students. This research project was approved by the institutional Research Ethics Committee under Nos. 261/09 and 278/09.

In Uberlândia, the overall anti-HAV seropositivity rate was 20.4% (62/304) of the students and their frequencies according to gender, age group, and school area are shown in Table 1. Seropositivity was higher among students of peripheral schools (25.3%) than those of central schools (15.6%). There were no significant differences in anti-HAV seroprevalence rates between females [28 (18.2%)] and males [34 (22.7%)]. Approximately 100% of the homes where children and adolescents lived had basic sanitation. The univariate analysis showed a significant association between positive anti-HAV and lower number of rooms in the home. The multivariate analysis did not show a significant association between seropositivity and the variables assessed. There were no significant differences in the frequencies of socioeconomic and household variables between students of central schools and those of peripheral schools.

In Limeira do Oeste, 13.1% (24/183) of the students had positive anti-HAV; their frequencies according to sex and age group are shown in Table 1. There were no significant differences in anti-HAV seroprevalence rates between females [11(11.8%)] and males [13 (14.4%)]. One quarter of the households did not have basic sanitation. The univariate analysis revealed that a more than six rooms, and the presence of water filter in the household had a statistically significant negative association with positive serological tests. The multivariate analysis did not show a statistically significant association between seropositivity and the variables assessed.

Table 1 – Frequency of serum anti-HAV in students of the cities of Uberlândia (n = 304) and Limeira do Oeste (n = 183), according to age group and gender.

Age group (years)	Uberlândia						Limeira do Oeste	
	Central school anti-HAV (+)		Peripheral school anti-HAV (+)		Total anti-HAV (+)		anti-HAV (+)	
	n	%	n	%	n	%	n	%
7–10								
Males	3/25	12	8/25	32	11/50	22	3/30	10
Females	2/26	7.7	2/25	8	4/51	7.8	2/31	6.4
Subtotal	5/51	9.8[a]	10/50	20	15/101	14.9	5/61	8.2
11–14								
Males	2/25	8	7/25	28	9/50	18	3/30	10
Females	3/25	12	7/25	28	10/50	20	5/32	15.6
Subtotal	5/50	10[a,b]	14/50	28[b]	19/100	19	8/62	12.9
15–18								
Males	9/25	36	5/25	20	14/50	28	7/30	23.3
Females	5/28	17.8	9/25	36	14/53	26.4	4/30	13.3
Subtotal	14/53	26.4[a]	14/50	28	28/103	27.2	11/60	18.3
TOTAL	24/154	15.6[c]	38/150	25.3[c]	62/304	20.4	24/183	13.1

[a] p = 0.03 (chi-squared test): age group (central school) 15-18 > 7-10 or 11-14.
[b] p = 0.04 (Fischer's exact test): peripheral school > central school.
[c] p = 0.05 (chi-squared test): peripheral school > central school.

A recent study showed that the total anti-HAV seroprevalence rate among adults aged 22-87 years in Uberlândia was approximately 100%.[5] The low seroprevalence observed in the present study demonstrates that there has been a reduction in the seroprevalence of the infection in this area. Adolescents and adults without immunity are vulnerable to this infection; at that age the disease is more severe than when acquired during childhood. This study contributes to the mapping of the regional distribution of vulnerability of the Brazilian population for this infection, which may benefit future public health policies for the implementation of strategies of vaccination against HA in this country.

Conflict of interest

All authors declare to have no conflict of interest.

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