

## Prevalence of antibody to hepatitis A virus in the Santa Cruz region of Bolivia

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### Summary

Several epidemiological studies have shown the worldwide distribution of hepatitis A with the highest prevalence of anti-HAV antibodies in developing countries (Papaevangelou 1984). There is no information about the epidemiology of hepatitis A in Bolivia. The goal of this study was to evaluate the anti-HAV antibody prevalence in the Santa Cruz region, south-eastern Bolivia.

### Introduction

The survey was carried out in November–December 1987 in three different localities in the southern part of the region: Camiri, Boyuibe and Javillo. Camiri is a city of 25 000 inhabitants situated in the foothills of the Andes at an altitude of about 800 m; it is called the Petroleum Capital of Bolivia. Some of the housing in the centre of the city is connected to a public sewage system and has running water supplied by an aqueduct which draws from the river Parapeti but is not treated for potability. Boyuibe (altitude 900 m) is a town with a population of about 2500 situated approximately 60 km south of Camiri. It is a poor town with no infrastructure or drinking water. The third locality, Javillo, is a very small community of about 110 persons isolated in the jungle north-east of Camiri. It is situated at an altitude of about 1500 m and is difficult to reach even by jeep. The population lives in huts without any

hygienic-sanitary equipment or services and the water supply is rain-water collected in small ponds.

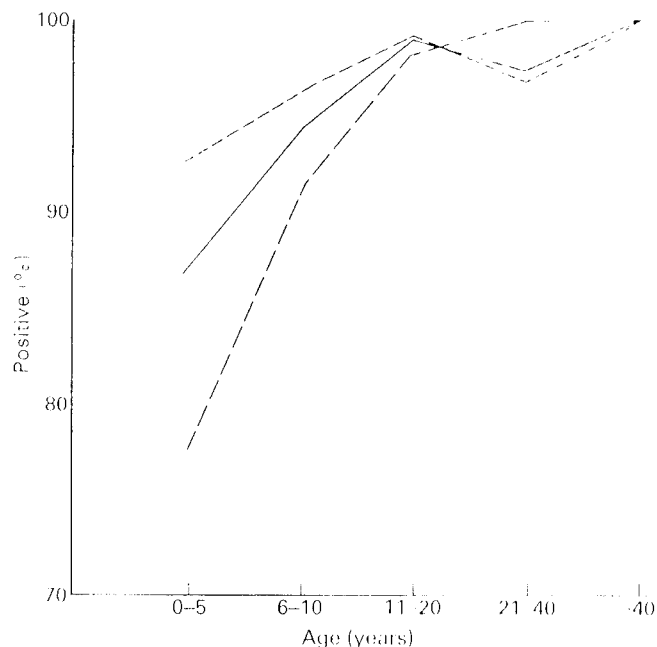
The study population consisted of 448 persons of both sexes, including subjects in hospital or who had presented to the out-patient clinics of the Camiri Hospital, hospital staff (in Camiri and Boyuibe), elementary and middle-school students (in Camiri and Boyuibe), and almost all the population of Javillo. Ethnically the population of Camiri and Boyuibe is mainly mestizos while in Javillo all are pure Guarani Indians.

### Methods

Samples of 10 ml venous blood were taken from all subjects. The sera were stored at  $-20^{\circ}\text{C}$ , transported to Italy in dry ice and then tested by ELISA (Hepanostika, Organon Teknika, Boxtel, Holland). The chi-square test with Yates' correction for small numbers was performed to evaluate the significance of differences observed.

### Results

Results are reported in Table 1 and Figure 1. Briefly, anti-HAV-antibodies were found in 436 (97.3%) of the 448 serum samples examined. Females had an insignificantly higher prevalence of anti-HAV (98%) than males (95.7%) ( $P > 0.10$ ). There were no statistically significant differences between the prevalences



**Figure 1.** Distribution of antibody to hepatitis A virus (anti-HAV) in the region of Santa Cruz according to age and sex. —, Total; ---, female, - · - ·, male.

**Table 1.** Prevalence of anti-HAV antibodies in the region of Santa Cruz by age, sex and locality

Age (years)	Male		Female		Total	
	Tested <i>n</i>	Positive <i>n</i> (%)	Tested <i>n</i>	Positive <i>n</i> (%)	Tested <i>n</i>	Positive <i>n</i> (%)
1-5	9	7 (77.7)	14	13 (92.8)	23	20 (86.9)
6-10	34	31 (91.1)	53	51 (96.2)	87	82 (94.2)
11-20	67	66 (98.5)	150	149 (99.3)	217	215 (99.0)
21-40	22	22 (100)	68	66 (97.0)	90	88 (97.7)
>40	10	10 (100)	21	21 (100)	31	31 (100)
Locality						
Camiri	30	29 (96.6)	149	146 (97.9)	179	175 (97.7)
Boyuibé	76	72 (94.7)	109	107 (98.1)	185	179 (96.7)
Javillo	36	35 (97.2)	48	47 (97.9)	84	82 (97.6)
Total	142	136 (95.7)	306	300 (98.0)	448	436 (97.3)

concerned the universal exposure to HAV at an early age is evidenced by an extremely high prevalence of anti-HAV (86.9%) in children 1-5 years old.

### Discussion

Interesting, but difficult to explain, is the high infection rate (97.6%) among the isolated

population of Javillo. Studies on small Arctic communities with poor sanitation evidenced the occurrence of periodic epidemics in such villages (Maynard 1963; Skinhøj *et al.* 1977). These studies showed that HAV disappeared from the community after exhausting almost all susceptible hosts at the end of an outbreak and anti-HAV age-specific prevalence curves showed the presence of a susceptible population between epidemics. The chance reintroduction of the virus resulted in a new outbreak. A similar situation could have occurred in Javillo: we may have conducted our study just after an outbreak of hepatitis A. In this regard we note that the anamnesis for recent episodes of jaundice was negative, and in any case we know that clinical hepatitis A, especially with jaundice, is rare in areas where the disease is hyperendemic. Moreover, evaluation of serum transaminase levels did not evidence values beyond the normal range. One might also speculate on the possible presence of a non-human reservoir of infection because of the close contact of the population with various animals, including

natural hosts of HAV and these would in any event be epidemiologically unimportant for the spread of the infection (Papaevangelou 1984). The real reasons for the age pattern of anti-HAV prevalence in Javillo evidenced by our study remain unknown. We hope further study on a longitudinal basis will reveal some novel aspect of the epidemiology of hepatitis A in this community.

The high prevalence of anti-HAV together with the nearly universal exposure of the total sample population in early childhood in the three localities studied indicate that this region should be included in the list of hyperendemic areas of HAV infection.

### References

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