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Prevalence of hepatitis A antibody among disadvantaged gypsy children in northern Spain

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SUMMARY

The prevalence of antibody to hepatitis A virus (HAV) in a group of socially and economically disadvantaged Spanish gypsy children was compared to that of a group of non-gypsy middle-class children. The study included 438 children, 73 gypsies (38 girls and 35 boys, mean age 8·5 years, age range 2–16 years) and 365 non-gypsy controls, randomly selected by age. The presence of anti-HAV was investigated using ELISA.

Among the gypsy children, 82% had antibodies to HAV compared with 9·3% of the children in the control group. The unfavourable living conditions of the gypsy population (e.g. homes with poor sanitary conditions, overcrowding) may explain the high prevalence of HAV infection. These findings underline the need for specific action which targets disadvantaged populations.

INTRODUCTION

Hepatitis A is an infection with a worldwide distribution whose transmission is facilitated by deficient socioeconomic, hygienic, and health conditions [1]. Although it is usually a mild disease and has a mortality of $< 1\%$, its high prevalence makes it an important public health problem with important economic consequences [1–3]. In recent decades, the circulation of hepatitis A virus (HAV) has decreased in the Mediterranean region of Europe [4, 5]. In the general population, the infection now tends to occur at later ages and the prevalence of acute icteric hepatitis among adults has increased. Data on the current epidemiology of hepatitis A among minority groups and disadvantaged sectors of the population are lacking. This motivated us to study the prevalence of HAV antibodies among socially and economically disadvantaged Spanish children of gypsy origin.

STUDY POPULATION AND METHODS

Study population

The study group consisted of 73 gypsy children who represented 80% of the children attending a school for gypsies in San Sebastian, Basque Country. 'Gypsy'

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is a term used to describe anyone with a gypsy ethnic origin. San Sebastian city and its surrounding area has 311505 inhabitants, including no more than 1000 gypsies. Serum specimens were collected during 1991–3 as part of a campaign to prevent hepatitis B. Thirty-eight were girls and 35 were boys; their mean age was 8·5 years (range 2–16 years, S.D. $\pm$ 3·6). The 73 children belonged to 30 family units. All were socially and economically disadvantaged and lived in homes with serious sanitary deficiencies, most had no running water. In Spain, the age at which children enter school is 3–5 years, but gypsy children, because of their lifestyle, start school at variable ages, and their school enrolment is not constant. Children < 5 year in these schools, were in different classrooms depending on their age.

Controls were randomly selected from middle class non-gypsy children from the same area, and matched for age (a total of 365 controls). They had been seen during the same time period in public health clinics, for reasons unrelated to exanthematic or hepatic diseases, e.g. preoperative studies for minor surgery, etc.

Serological studies

A serum specimen was obtained from each child by venipuncture and stored at −40 °C until tested. The presence of total (IgM + IgG) antibodies to hepatitis A virus was investigated with a commercial enzymoimmunoanalysis technique (Hepanostika anti-HAV antibodies, Organon Teknika, Boxtel, The Netherlands) according to the manufacturer's instructions.

Statistical analysis

Data were analysed with standard tests using the Analysis and Statcalc Programs (Epiinfo 1990, CDC, Atlanta, GA, USA). The level of significance chosen was $\alpha = 0{\cdot}05$.

RESULTS

A total of 60 of the 73 gypsy children had antibodies to HAV (82·2%). The percentage of immune children increased with age. The prevalence of anti-HAV was 50·0% (9/18) in gypsy children 2–5 years-old and 92·7% (51/55) in older gypsy children (Fisher's exact test $P = 0{\cdot}0002$, OR = 0·08 with an exact confidence interval of $0{\cdot}02 < \text{OR} < 0{\cdot}37$).

Only 34 of the 365 children in the control group had HAV antibodies (9·3%). The percentage of immune children also increased with age, but it did not exceed 20% in even the oldest children. The differences in seroprevalence between the gypsy and non-gypsy groups were statistically significant in the overall comparison ($\chi^2 = 191{\cdot}7$; $p < 0{\cdot}00001$; OR = 44·9 with an exact interval of confidence of $21{\cdot}5 < \text{OR} < 97{\cdot}2$) and in each of the three age groups studied (Table 1).

Seroprevalence was not influenced by duration of schooling. Of 9 gypsy children aged 5–14 years who had attended school for only 1 year, 7 had anti-HAV antibodies.

DISCUSSION

Our results show that HAV infection was much more common among the gypsy children studied than in the middle class population of children. From an early age

Table 1. *Antibodies against hepatitis A virus in two groups of children of Guipuzcoa (Basque Country, Spain). Group A: disadvantaged gypsy children; group B: non-gypsy children of middle-class socioeconomic background*

	Group A			Group B						
Age (yr)	No.	Anti-HAV No.	(%) positive	No.	Anti-HAV No.	(%) positive	χ^2	P	Odds ratio	Exact confidence limits
2–5	18	9	(50·0)	90	0	(0·0)	*	$< 10^{-7}$		Not defined
6–10	33	32	(97·0)	165	12	(7·3)	128·0	$< 10^{-7}$	408·0	54·8 < OR < 167·3
11–16	22	19	(86·4)	110	22	(20·0)	37·7	$< 10^{-7}$	22·6	6·4 < OR < 140·8
Total	73	60	(82·2)	365	34	(9·3)	191·7	$< 10^{-7}$	44·9	21·5 < OR < 97·2

* Fisher's exact test.

the gypsy children had a high prevalence of infection. The epidemiological pattern of this group differs from that of the middle class population in our region and is similar to that of developing nations [1, 2, 6–8]. The unfavourable living conditions of the gypsy children (e.g. homes without running water or plumbing, a high birth rate with overcrowding in small spaces, etc.) may explain the high incidence of HAV infection among these children [1, 7]. In the Basque Country, Spain, more than 99·5% of homes have running water and 98% have bathrooms [9]. HAV infection, in contrast with HBV infection, shows no particular predisposition for race as an independent factor [1].

The itinerant lifestyle of part of the gypsy population makes census-keeping, school enrolment and disease prevention campaigns difficult. The number of gypsies in Basque Country and, specifically, in Guipúzcoa is difficult to determine, but the highest estimates do not exceed 0·5% of the population. There is no history of epidemic outbreaks in the school and promotion of personal hygiene and other preventive measures has been a concern for authorities. Most gypsy children > 5 years who have started school recently have anti-HAV antibodies, so we assume that the concentration of children in the school does not enhance viral transmission. In most developed countries, the prevalence of hepatitis A is higher in the most disadvantaged groups and the prevalence of HAV antibodies increases at lower income levels [10]. We are not aware of any studies of the prevalence of HAV infection among gypsies, but the gypsies in Spain are a socially and economically disadvantaged group of people and hepatitis A is known to be more common among population groups with low standards of hygiene, such as intravenous drug users and the mentally retarded [1, 11, 12]. The results of our study probably can be extrapolated to other similarly disadvantaged population groups in Spain, both gypsies and non-gypsies.

The results obtained in the control group confirm those of studies of seroprevalence in the Basque Country [5] and other Spanish Autonomic Communities [13, 14]. These results indicate that contact with HAV among the young is generally infrequent. Improved hygiene and health conditions in recent decades explain this change in the epidemiologic pattern of hepatitis A. A similar trend has been observed in other western European and Mediterranean European countries [4, 15–18]. However, in recent years the number of declared cases has

increased in some developed countries, such as the United Kingdom [19]. This increase has occurred mainly in urban populations of low socioeconomic status. Therefore, the decline in the prevalence of HAV infection observed in the general population either does not affect or affects more slowly the population groups of low socioeconomic status. Hepatitis A has been mentioned as a potential marker of 'inner-city deprivation' [19]. This situation, aside from reflecting a social inequality that should be corrected, can facilitate the transmission of hepatitis A to the general population with the attendant danger of more severe disease among susceptible adults [7, 20].

There is now an inactivated-virus vaccine against hepatitis A and it can be foreseen that attenuated-virus vaccines will be authorized in the future [21, 22]. The inactivated-virus vaccine is highly effective [18, 22], but we do not know how long immunity lasts and indications for vaccination are not agreed upon [23]. If the protection achieved were long-lasting, populations such as the gypsy people that we studied would be preferred candidates for vaccination. Aside from the individual benefits to be obtained, such a campaign would help to interrupt viral circulation.

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