Prevalence of *Helicobacter pylori* infection in the Vallès Occidental, Catalonia

*Marta Navarro*, *Xavier Calvet*, *Bernat Font*, *Isabel Sanfeliu* and *Ferran Segura*

1Department of Internal Medicine, 2Department of Microbiology, 3Infectious Diseases Program, Corporació Sanitària del Parc Taulí, 08208 Sabadell, Barcelona, Spain

*Tel:* +34 937231010 (20010)  *Fax:* +34 937160646

E-mail: xcalvet@cspt.es

Accepted 11 May 1999

*Helicobacter pylori* is the main pathogenic factor in peptic ulcer disease [1–3]. It has also been implicated in the development of gastric carcinoma and the gastric MALT-type lymphoma [4,5]. Treating complications of this infection has a high cost. At present, our knowledge of its epidemiology is limited; a more thorough understanding would help in the design of appropriate strategies for diagnosis and treatment, or in determining which candidates should receive vaccination in the future.

Few reports of the prevalence of *H. pylori* infection in Spain have been published. Most of the papers that mention the infection provide only indirect data, from populations submitted to endoscopy [6–8], blood donors [9–12], or relatives of patients with peptic ulcer [13]. Few studies have been designed to estimate the prevalence of the infection in the general population [14,15].

The objective of our study was to determine the prevalence of *H. pylori* infection in a population sample from the Sabadell area, and to analyze its distribution according to age, sex and demographic area.

The Corporació Sanitària del Parc Taulí is situated in the Vallès Occidental, a region in Catalonia, northeastern Spain, some 30 km from Barcelona. The area has two highly industrialized cities, Sabadell and Terrassa, with around 150,000 inhabitants each, and outlying rural areas. The population is ethnically homogeneous, being composed mainly of Caucasians. The population eligible for inclusion in the study were residents in the villages and cities in the hospital’s referral area: according to the 1986-AEC/89 census, the total population of this area is 352,266. A sample of 214 patients, all of whom had received attention at this hospital between September 1994 and January 1995, was chosen for the survey. The sample included 165 adults undergoing minor surgery, and 49 children seen in the Pediatrics Emergency Service. The inclusion criteria were: (1) residence in one of the towns in the study area; and (2) performance of a blood extraction during the medical visit. The sample was stratified according to age and in proportion to the study population, as reflected in the 1989 Statistics Yearbook of Catalonia, based on the 1986 census. Subjects were distributed into 10-year age groups, from 0–10 to over-70. Three demographic areas were distinguished in each age group, according to the total population in the place of residence (fewer than 5000 inhabitants was considered a rural area, between 5000 and 50000 a semi-urban area, and more than 50000 an urban area). Patients gave informed consent to participate, and the hospital’s Ethics and Research Committee approved the study.

Sera were frozen at −70°C until analysis. The prevalence of *H. pylori* infection was studied serologically using a commercial ELISA (*Pylori Stat Bio Whittaker, Walkersville, Md, USA*). Following the manufacturer’s specifications, the result of the test was considered positive when the values were superior or equal to 0.20, and negative when they were inferior. In the case of children under 10, the serology was initially analyzed using the same cut-off as for the adults, and subsequently using a value equivalent to 50% of the adults’ cut-off point. The serology test was repeated in 70 samples, chosen at random, and a correlation of 95% was obtained. The prevalence of *H. pylori* infection was estimated to be about 70% for the calculation of the sample size. The margin for error calculated for estimating the prevalence in 214 patients is ±6%. Comparison of qualitative variables was made by means of the chi-square test. The results are expressed as a percentage of the total number of patients in each group.

Eighty-three of the 214 patients had positive serology for *H. pylori* and 131 were negative. One hundred and eighteen were men (55.1%) and 96 women (44.8%). The average age was 33. The age range was 0–90 years. The overall prevalence of the infection was 38.7%. Prevalence increased progressively with age, until the 41–50-year age group, in which a prevalence of 68.8% was estimated. Prevalence then diminished gradually in the older age groups. Only one of the patients in the 0–10-year group (*n=40*) was
positive for *H. pylori*, using both the same point of reference as for adults and 50% of this figure as cut-off point (Table 1).

Although a trend towards increased prevalence in males was observed, the differences did not reach statistical significance: 51 of 118 (43.2%) men were positive and 32 of 96 (33.3%) women (*p*=0.18). Differences in prevalence analyzed according to distribution by demographic area were not significant either: 51 of 138 (36.9%) in urban areas and 32 of 76 (42.1%) in semi-urban or rural areas (*p*=0.22).

Our knowledge of the epidemiology of *H. pylori* infection has progressed rapidly in recent years. There are substantial differences in prevalence between developed countries (30–50%) and developing countries (80–90%), a finding that probably reveals the greater ease of transmission in areas with worse hygienic conditions [16]. Fecal–oral transmission through drinking water has been demonstrated in developing countries [17], and the possibility of oral–oral transmission in developed countries has been suggested [18,19]. *H. pylori* infection is usually acquired during infancy, and persists for many years. Most infected subjects do not present any symptoms; however, histologic study reveals chronic type B gastritis in all patients with *H. pylori* infection [20]. The prevalence of *H. pylori* infection has been correlated with age, social class, educational level, and economic and hygienic conditions during infancy [16,21,22].

In this study, the prevalence of *H. pylori* infection (Table 1) remains low until the age of 20 (<15%), as is observed in northern European countries. At this age, prevalence increases rapidly, reaching 69% in the 41–50-year age group. This prevalence then tends to fall, but remains above 50% in the over-70s. It remains unclear whether this fall in prevalence after the age of 50 reflects a true decrease (either because of spontaneous cure or a cohort effect) or merely a decreased sensitivity of serology in detecting *H. pylori* infection in older subjects. In any case, data concerning age distribution should be treated with care, as the number of patients in each subgroup is small. Therefore, variability in subgroups may be greater than the 6% calculated.

The data currently available are still insufficient to establish a reliable map of the prevalence of *H. pylori* infection in Spain. Only two studies have been designed as population studies, i.e. stratifying the sample according to age and sex of the population in the studied area. The prevalence observed in our study is similar to that reported in the first of these studies, by Rodrigo et al [15] in a general population in Asturias, northern Spain, where 480 sera were studied. The overall prevalence was estimated at 49%, similar to ours, as was the distribution according to age. In the paper by Carballo et al [14], on Guadalajara, a rural area near Madrid, in central Spain, 84% of the general population had serology that was positive for *H. pylori—a far higher prevalence than in the rest of the papers published.

Our results are comparable with those obtained in Barcelona [8], Guipúzcoa [11], Asturias [15] and Madrid [12], all industrialized areas. Interestingly, the studies conducted in Valencia [13] and Alicante [10], and Mallorca [9], in the southeastern Mediterranean area, report a lower prevalence, at least until the 41–50-year age group. After this age, the distribution is similar to that in the other locations. It is noteworthy that no data are available on the prevalence of infection in central and southern areas of Spain, and, therefore, further studies are required to determine the real distribution of *H. pylori* infection in this country.

In conclusion, this study suggests that the prevalence of *H. pylori* infection in our area is higher than those generally recorded in developed countries, and lower than in developing countries. The low prevalence in the age groups under 30 is closer to the pattern of the Western countries, and suggests that a progressive decline in diseases secondary to *H. pylori* infection will be observed in the future. In contrast, prevalence in the population over the age of 30 is very high. This may perhaps be explained by the prolonged economic depression after the Spanish Civil War (1936–39).

**Table 1** Prevalence (in %) of *Helicobacter pylori* infection according to age

<table>
<thead>
<tr>
<th>Age</th>
<th>Patients (n)</th>
<th>Positive (n)</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–10</td>
<td>40</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>11–20</td>
<td>28</td>
<td>4</td>
<td>14.2</td>
</tr>
<tr>
<td>21–30</td>
<td>34</td>
<td>12</td>
<td>35.2</td>
</tr>
<tr>
<td>31–40</td>
<td>25</td>
<td>13</td>
<td>52.0</td>
</tr>
<tr>
<td>41–50</td>
<td>32</td>
<td>22</td>
<td>68.7</td>
</tr>
<tr>
<td>51–60</td>
<td>23</td>
<td>15</td>
<td>65.2</td>
</tr>
<tr>
<td>61–70</td>
<td>15</td>
<td>8</td>
<td>53.3</td>
</tr>
<tr>
<td>&gt;70</td>
<td>17</td>
<td>9</td>
<td>52.9</td>
</tr>
<tr>
<td>Total</td>
<td>214</td>
<td>83</td>
<td>38.7</td>
</tr>
</tbody>
</table>

**Acknowledgments**

Dr Julio Ponce provided us with some of the references that were particularly hard to find, in a lecture given at the National Congress of the Spanish Society of the Digestive System in 1996. We also thank Javier Dominguez and Michael Maudsley for their help in writing the paper, and Inuma Martin, Nuria Altimir and Maria Rosa Perarnau for their efficiency and dedication.
Brucellosis is a zoonosis caused by microorganisms of the genus *Brucella*. In Europe, the human disease is endemic in Portugal, as it is in countries of the Mediterranean basin [1]. Recognition of acute infection is easy when the presentation is typical, but, even in endemic areas, the varied and sometimes non-specific manifestations of the disease may be responsible for misdiagnosis of some cases. The diagnosis of the infection is established with certainty when brucellae are isolated from body tissues or fluids, mainly blood [1,2]. *Brucella* spp. are fastidious microorganisms and, traditionally, blood cultures should be held for 30 days instead of the typical 5–7 days before being discarded as negative [3]. Some modern automatic blood culture systems detect the organism faster than manual methods. Detection of *Brucella* bacteremia by using the VITAL automated system and Tryptose Broth culture

Clin Microbiol Infect 1999; 5: 706–709

José Melo-Cristino¹,²* and Maria José Salgado²

¹Faculty of Medicine, University of Lisbon and ²Laboratório de Bacteriologia, Hospital de Santa Maria, Av. Prof. Egas Moniz, 16700 Lisboa, Portugal

*Tel: +351 1 790 1364  Fax +351 1 885 1437  E-mail: melocris@mail.telepac.pt

Accepted 27 April 1999

References