Invited Commentary: Dynamics of Helicobacter pylori Infection in Childhood

David N. Taylor

Bacterial infection of the human stomach with Helicobacter pylori is a risk factor for peptic ulcer disease and gastric cancer. Infection with H. pylori usually occurs during childhood and lasts for a lifetime. The prevalence curve rises with age, more rapidly during childhood than in adulthood (1). In this issue of the Journal, in 365 children aged 4-7 years from a poor Mexican-American community outside El Paso, Texas, Redlinger et al. (2) found that the prevalence of infection actually fell from nearly 36 percent in those aged 4 years to 14 percent in those aged 7 years (2). They suggest that spontaneous clearance or resolution of infection is a likely explanation for the decrease in seroprevalence.

To summarize a vast body of epidemiologic literature, infection is many times more common in developing countries than in developed ones. Within a given population, infection is more common in lower socioeconomic groups. In all populations, infection is most commonly acquired in childhood and usually lasts for the lifetime of the individual. Thus, seroprevalence usually shows a steady increase with age. Another phenomenon, called the cohort effect, has been observed in the United States, Europe, and Japan, where the infection rate declined according to the birth year, probably due to an overall improvement in hygiene over time.

Spontaneous elimination of infection has been observed before and perhaps, as infection rates drop, will be observed more frequently in the future. Infection can be directly detected in the gastric mucosa by endoscopy or indirectly by using serology or the urea breath test (UBT). Epidemiologic studies usually rely on one of the indirect tests. Serology is accurate at determining prevalence of infection but is often slow to respond to changing status, taking up to 6 months to become negative after the infection is eradicated following treatment with antimicrobials. The UBT is more responsive but is also more time consuming and expensive. Using the UBT, Klein et al. (3) found that the prevalence declined from 71 to 48 percent in Peruvian children aged 6-18 months and that children frequently changed their infection status during at this age. Similarly, the prevalence of infection dropped in Nicaraguan children, from 91 percent in children less than age 1 year to 63 percent in children aged 1-5 (4). An analysis of paired sera collected in 1986 and 1994 from 644 Japanese showed that in children aged 6-19 years the seroreversion rate was higher than the seroconversion rate (1.8 vs 1.1 percent) (5). Seroreversion was observed over 2 years in 16.6 percent of 48 Italian children (6), and in Sweden, the prevalence of infection was 10 percent at age 2 years and declined to 3 percent by age 10 (7). Clearance of infection in childhood may be due to the use of antimicrobials or perhaps caused by strains of H. pylori that cannot permanently colonize the stomach.

Differences in the point estimates of infection in this narrow age group must be interpreted with caution. Those aged 4 years were the smallest group (only 28 children), and they were collected outside the school cohort. Thus, this group may not be as representative a sample as the others. Without this group, the seroprevalence still declines from 24 to 14 percent from ages 5-7. A cohort effect is possible, but the authors did not find demographic or socioeconomic differences that could account for the age-related decrease in seroprevalence. In a large serosurvey in Mexico in which sera from more than 11,000 individuals were tested, the prevalence increased from 24.5 percent in those aged 1-4 years to 42.5 percent in those aged 5-9; the increase was highly significant (8). Yet, within these intervals, there was one decline of more than 5 percent. A narrow window may lose sight of the larger trend.

In studies in the United States in which the infection rate has decreased, it becomes more difficult to discern a change. For example, Staat et al. (9) found that in Mexican Americans the prevalence only increased...
from 33.8 percent in those aged 6–9 years to 37.7 percent in those aged 10–14, a difference that was not significant. Yet, in the age group 15-19 years, the prevalence increased to 53 percent, making the overall age-related increase highly significant.

The question of significance remains.

REFERENCES