Social and ecological determinants of Helicobacter pylori infection in the Philippines

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Introduction

Helicobacter pylori (H. pylori) is a bacterium that infects the gastrointestinal tract, and without proper eradication, can lead to chronic infection.[1]

H. pylori infection is associated with gastrointestinal diseases such as peptic ulcer disease and gastric cancer.[1]

Crowding, hygiene, water sources, socioeconomic status (SES), gender, and urbanicity have been identified as social and ecological determinants of H. pylori infection, however, risk factors vary across contexts.[2-5]

The objective of this poster is to discuss social and ecological determinants of H. pylori seropositivity in the Philippines to better understand the causes of infection within this context.

Data

The Cebu Longitudinal Health and Nutrition Survey (CLHNS) is a longitudinal study of health outcomes for a cohort of individuals born between 1983 and 1984 in Metro Cebu, Philippines.[6] This study draws from data collected during the 2005 follow-up survey.

Sociodemographic variables: Assets, education, history of marriage, income, medical expenditure, sex, and urbanicity scale.

Ecological variables: Crowding, excrement near house level, garbage disposal location and method, hygiene index, neighborhood garbage level, toilet privacy, toilet type, and usual source of drinking water.

H. pylori seropositivity: 128 randomly selected dried blood spots (DBS) were analyzed for H. pylori antibody levels using a protocol modified for DBS.[7]

Antibody levels < 12.2 EU/mL = seronegative. Levels > 15.3 EU/mL = seropositive. Four samples were equivocal and excluded.

Sample Characteristics

Table 1. Descriptive statistics for characteristics of individuals included in the analysis.

Characteristic	n / N (%); Mean (SD)
Seropositivity (N = 124)	
Positive	40 / 124 (32%)
Negative	84 / 124 (68%)
Sex (N = 124)	
Female	66 / 124 (53%)
Male	58 / 124 (47%)
Age (N = 124)	21.0 (0.3)
History of Marriage (N = 124)	
Married	19 / 124 (15%)
Never married	105 / 124 (85%)
H. pylori Antibody (EU/mL, N = 40) [1]	41.5 (22.3)
[1] Antibody level from seropositive samples only	

Sociodemographic Variables

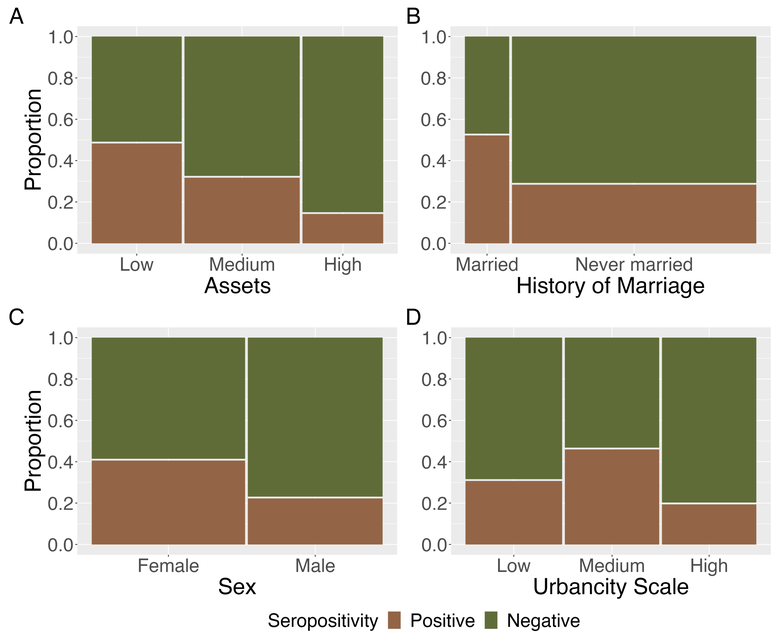

Figure 1. Distribution of H. pylori seropositivity across the social variables (A) assets, (B) history of marriage, (C) sex, and (D) urbanicity scale.

The odds of seropositivity were significantly greater for having a low asset score (OR = 5.70, 95% CI [1.94, 19.5]) compared to a high asset score, for having a history of marriage (OR = 2.78, 95% CI [1.02, 7.66]), for females (OR = 2.4, 95% CI [1.11, 5.40]) compared to males, and for medium urbanicity (OR = 3.56, 95% CI [1.37, 9.99]) compared to a high urbanicity.

Ecological Variables

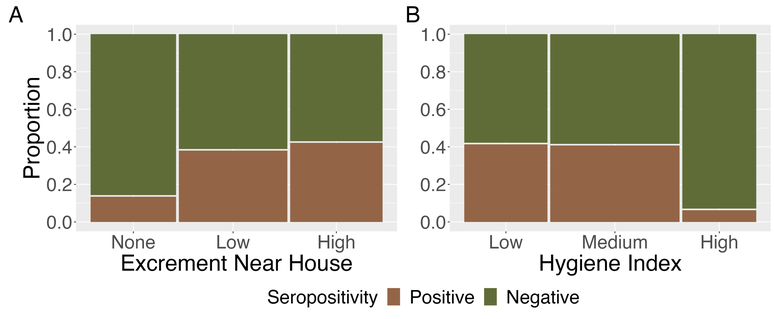

Figure 2. Distribution of H. pylori seropositivity across the ecological variables (A) excrement near house and (B) hygiene index.

The odds of seropositivity were significantly greater for having low (OR = 3.97, 95% CI [1.39, 13.3]) or high (OR = 4.73, 95% CI [1.61, 16.1]) excrement near house compared to no excrement near house and having medium (OR = 10.5, 95% CI [2.77,68.6]) or low (OR = 10.7, 95% CI [2.66,72.7]) hygiene index compared to a high hygiene index.

Multivariate Results

Multivariate logistic regression with sex, assets, and hygiene showed that a low asset score (OR = 4.25, 95% CI [1.23, 16.6]) and a medium hygiene score (OR = 8.05, 95% CI [2.04, 54.1]) remain associated with seropositivity.

Conclusion and Discussion

Analysis of social and ecological determinants of H. pylori infection suggest that assets (SES) and hygiene were predictive of infection.

Education, income, medical expenditure, crowding, garbage disposal location and method, neighborhood garbage level, toilet type, and usual source of drinking water were not associated with seropositivity.

While there was a female sex bias for infection, sex itself was not predictive of seropositivity in multivariate analysis. This indicates that gender disparities in access to sanitation and hygiene infrastructure likely drive this relationship.

The increased odds of seropositivity for lower hygiene indices and higher levels of excrement near house supports the hypothesis that H. pylori is transmitted through the fecal-oral route.[8] The lack of association between seropositivity and usual source of drinking water suggests transmission via direct exposure to fecal matter rather than indirectly through drinking water.

Increased access to sanitation infrastructure, such as a centralized sewage management system,[9] could reduce the prevalence of H. pylori infections in Metro Cebu, Philippines.

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