Reviewer’s report

Title: An association between Helicobacter pylori infection and cognitive function in children at early school age: a community-based study

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Reviewer: Marianne M Hillemeier

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This paper examines the association between H. pylori infection and Stanford-Binet IQ score. The introduction discusses evidence that H. pylori infection is associated with iron deficiency, which in turn is associated with lower cognitive development and school performance. It is then hypothesized that H. pylori itself might negatively affect cognitive development independently of socioeconomic and nutritional factors. No rationale or conceptual framework is provided at the outset to explain why this independent effect might be expected.

More information about the target population and study sample is also needed. The methods section states that the 200 children who were included in the present analyses were part of a previous project three to five years prior to the current data collection. It is not clear how the sample in the original project was chosen and recruited, and the degree to which they are representative of the identified target population, Israeli Arabs. Why is the study focused on this target population? Also, how were the three villages included in the study selected? Are they typical? Without this information it is difficult to determine whether the findings are at all generalizable beyond the study sample.

More fundamentally, however, the present analyses are not sufficient to support the conclusion as stated that H. pylori infection is associated with lower cognitive function, independent of socioeconomic and nutritional status. Although the authors do note that conclusions regarding a causal association cannot be drawn, the analyses are limited by small sample size and other considerations such that the claim of association is also in doubt. In multivariate models H. pylori was significantly associated with IQ score in only the highest SES village out of the 3 villages included in the study, which appears to be a non-robust finding since that village seems quite similar to the “intermediate SES” village as measured by educational level (Table 1) in which the H. pylori/IQ association was not seen. More fundamentally, the inclusion of only maternal education, maternal age, and hemoglobin level in the high SES village analysis leaves open the strong possibility that other factors affecting cognitive functioning have been omitted from the model, allowing their effects to load on the H. pylori variable. It is likely, for example, that other aspects of social position not captured by maternal education alone predispose children to both H. pylori infection and lower cognitive development. It is also not clear why other available variables including the crowding index were not included in the high SES village model.

This paper would also benefit from thorough editing to eliminate grammatical
errors and awkward phrasing.

**Level of interest:** An article of limited interest

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare I have no competing interests