

RESEARCH ARTICLE

H. Pylori Infection: A Silent Epidemic that Affects Disadvantaged Populations in Haiti

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ABSTRACT

Helicobacter pylori (HP) infection is the main cause of chronic gastritis and the principal etiological agent for gastric cancer and peptic ulcer disease. Its prevalence is generally related to socioeconomic status and levels of hygiene. In Cornillon, a commune in Haiti, a large number of patients with gastrointestinal complaints reinforced our commitment to look for the correlation with HP infection in Haiti. This is a qualitative and quantitative observational study that gathered data from 109 patients who went to Sainte Thérèse Hospital in Miragoâne, Georges Gauvin Hospital in Grand-Goâve, and the Health Center of Cornillon Grand Bois for gastrointestinal complaints from April to July 2019. The seroprevalence of the HP infection was 87.2% and the sex ratio of patients M/F was 0.45. We found that 88.5% (n=96) of all patients were from the lower social class and disadvantaged communities in rural areas. The majority of infected patients were street traders, farmers, students and jobless individuals. 42.2% (n=46) of all participants were street traders and 91.3% of the street traders had a positive HP result. The HP infection itself is not fatal, but its resulting complications are for those who live in the Global South (lower income countries) with a lack of adequate primary care. The high burden of gastric cancer in Haiti is likely one of the consequences of the high prevalence of HP infection.

INTRODUCTION

Helicobacter pylori (HP) is a bacterium that infects the epithelial lining of the stomach, its main mechanism of spread is intrafamilial transmission [1]. HP infection is the main cause of chronic gastritis and the principal etiological agent for gastric cancer and peptic ulcer disease [2]. Its prevalence is generally related to socioeconomic status and levels of hygiene; its incidence can be decreased with improved standards of living [1]. In 2019, we noticed a large number of patients with gastrointestinal complaints during consultations in three different health facilities in Haiti. They were mostly from disadvantaged communities in rural Haiti who were

seeking solutions for their sicknesses. This attracted our attention to look for the correlation between gastrointestinal complaints and HP infection within the larger context of social determinants of health. A precarious socioeconomic situation exists in Haiti that encourages the HP infection to spread and remain prevalent. This study highlights the impact of HP infection on vulnerable populations in Haiti and the burden of gastric cancer as a possible consequence.

METHODOLOGY

This is a qualitative and quantitative observational study that gathered data from 109 patients who

went to Sainte Thérèse Hospital in Miragoâne, Georges Gauvin Hospital in Grand-Goâve and the Health Center of Cornillon/Grand-Bois for gastrointestinal complaints from April to July 2019. A literature review was conducted and patient data was collected from questionnaires completed on the day of the medical examination. The results of the biological analysis (serological testing for evidence of HP) were reported on the questionnaires. To ensure ethics compliance, each patient meeting the inclusion criteria was identified with alphanumeric codes and signed the consent form to take part in the study.

Inclusion criteria:

1) Patients 20 to 60 years of age with gastrointestinal symptoms. 2) All patients in the age range with a definite indication for HP eradication (formal or discussed).

Exclusion criteria:

1) Pregnant women. 2) Those who refused or could not consent. 3) Those with gastrointestinal hemorrhages or any life-threatening medical condition. 4) Patients treated with anticoagulants.

RESULTS

A total of 109 patients were enrolled. 51.4% (n=56) were evaluated at Georges Gauvin Hospital in Grand-Goâve, 38.5% (n=42) were evaluated at Cornillon Grand Bois Health Center and 10.1% (n=11) at Sainte Thérèse Hospital in Miragoâne. The seroprevalence of the HP infection was 87.2% and the sex ratio of patients M/F was 0.45. This study was carried out according to the age range of patients between 20 to 60 years, with an average age of 36. We found that 88.5% (n=96) of patients who went to the health facilities for gastrointestinal complaints were from the lower social class and disadvantaged communities.

42.2% (n=46) of all participants were street traders and 91.3% of the street traders had a positive HP result. The most frequent chief complaints for patients who participated in the study were: epigastralgia (73.4%), heartburn (65.1%) and acid reflux (57.8%). We found that 34.9% (n = 38) of the

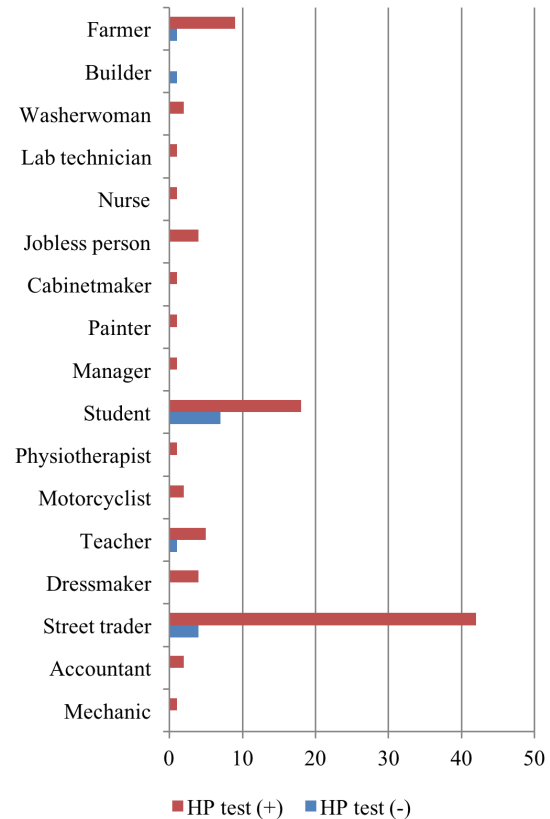


Figure 1. HP test results by patients activities.

treatment to eradicate HP. Of those, 97.4% were still symptomatic with a positive HP test. It was found that 87.2% (n = 95) of the patients took their daily meal at home and 86.3% of the patients who took their daily meal at home were seropositive for HP.

DISCUSSION

With a prevalence of 79.1% in Africa, 63.4% in Latin America and the Caribbean compared to 37.1% in North America and 24.4% in Oceania, HP infection disproportionately affects populations of low economic status in the Global South (lower income countries) [1]. Gathering data on patients' lifestyle, daily activities and locations was one of the most concrete methods to determine their socioeconomic status.

The majority of infected patients were street traders, farmers, students and jobless individuals with low income. They were mostly from the rural areas of

Cornillon, Grand-Goâve, Léogane, and Miragoâne, four regions with low resources and limited access for primary care in Haiti [3]. There are significant wealth and public health gaps between rural and urban populations in Haiti, with almost 70% of rural households considered chronically poor, compared to little over 20% urban households. Only 16% of people in rural areas have access to improved sanitation compared to 48% of people in urban areas [4].

Table 1. Number of patients by commune.

Commune	Area	Number of patients
Miragoâne	Urban	8
	Rural	3
Grand-Goâve	Rural	26
Petit-Goâve	Rural	2
Carrefour	Urban	5
Léogane	Rural	19
Ile de la Gonâve	Rural	1
Port-au-Prince	Urban	2
Gressier	Rural	1
Cornillon	Rural	42

The results of a similar study in Cameroon also demonstrated low socioeconomic status as a potential risk factor of HP infection [5]. Beyond general sanitation and improved socioeconomic status, HP can be eradicated by different drug regimens. This study shows that 97.4% of 38 patients who already received an appropriate eradication treatment were still symptomatic with a positive HP test. This is evidence that prescribing drug regimens without addressing non-medical factors such as income levels and living conditions, is insufficient.

In populations where HP infection rates are high, stomach cancer is a significant public health problem despite other risk factors control (diet, smoking, body weight and alcohol use) [6]. Countries in Western Europe (e.g. Germany, the United Kingdom, and Spain) and in the United States, saw a decreased burden of stomach cancer with an increased control of HP infection. In comparison, countries in the Global South are struggling to control HP infection and decrease the

burden of stomach cancer [2,7].

When disadvantaged communities have limited access to primary care and the Haitian healthcare system is unable to provide adequate care, infections like HP have the power to silently spread, evolve and cause fatal complications in vulnerable populations [3,8]. Based on the findings of this study, the high burden of gastric cancer in Haiti may be correlated with the high prevalence of HP infection. With a mortality rate of 62.7%, gastrointestinal cancers have the highest incidence in comparison to all other cancer types in Haiti. Gastric cancer is the second most common type of gastrointestinal cancer; and with growing evidence of a link with HP, colorectal cancer is the most common type of gastrointestinal cancer [9].

CONCLUSION

The seroprevalence of HP infection in this sample of the Haitian population is extremely high. This infection disproportionately affects disadvantaged populations in Haiti and around the world. The HP infection is not fatal in and of itself, but its complications are for those who live in the Global South with limited primary care. The high burden of gastric cancer in Haiti is likely a consequence of the high prevalence of HP infection. In this pandemic era, we need to be aware that social determinants of health matter and solutions to epidemics go beyond biology. HP infection must be eradicated with holistic and medical approaches to prevent long-term complications for the most vulnerable. We strongly recommend further exploration on HP infection and its correlation with gastric cancer in Haiti.

REFERENCES

1. Hooi JK, Lai WY, Ng WK, Suen MY, Underwood FE, Tanyingoh D, et al. Global prevalence of *Helicobacter pylori* infection: systematic review and meta-analysis. *Gastroenterology*. 2017 Aug;153(2):420-29.
2. Malfertheiner P, Megraud F, O'Morain C, Bazzoli F, El-Omar E, Graham D, et al. Current concepts in the management of *Helicobacter pylori* infection: the Maastricht III Consensus Report. *Gut*. 2007;56(6):772-81.
3. Gage AD, Leslie H, Bitton A, Jerome GJ, Thermidor R, Joseph JP,

et al. Assessing the quality of primary care in Haiti. *Bull World Health Organ.* 2017 Mar;95(3): 182-190

4. World Bank. Living conditions in Haiti's capital improve, but rural communities remain very poor [Internet]. 2014 [Cited 2020 Dec 16]. Available from: <https://www.worldbank.org/en/news/feature/2014/07/11/while-living-conditions-in-port-au-prince-are-improving-haiti-countryside-remains-very-poor>

5. Kouitcheu Mabeku, L.B., Noundjeu Ngamga, M.L. & Leundji, H. Potential risk factors and prevalence of *Helicobacter pylori* infection among adult patients with dyspepsia symptoms in Cameroon. *BMC Infect Dis* [Internet]. 2018[Cited 2020 Dec 20];18:278. Available from: <https://bmcinfectdis.biomedcentral.com/articles/10.1186/s12879-018-3146-1> DOI: <https://doi.org/10.1186/s12879-018-3146-1>

6. Etemadi A, Safiri S, Sepanlou SG, Ikuta K, Bisignano C, Shakeri R, et al. The global, regional, and national burden of stomach cancer in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease study 2017. *Lancet Gastroenterol. Hepatol.* 2020 Jan;5(1):42-54.

7. Ferro A, Peleteiro B, Malvezzi M, Bosetti C, Bertuccio P, Levi F, et al. Worldwide trends in gastric cancer mortality (1980–2011), with predictions to 2015, and incidence by subtype. *Eur J Cancer.* 2014 May;50(7):1330-44.

8. Durham J, Michael M, Hill PS, Paviignani E. Haïti and the health marketplace: the role of the private, informal market in filling the gaps left by the state. *BMC Health Serv Res* [Internet]. 2015[Cited 2020 Dec 24]; 15: 424. Available from: <https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-015-1088-5> DOI: 10.1186/s12913-015-1088-5

9. Bernard J, Gilbert D, Germain R, Alexis L, DeGennaro V. A three-year study of epidemiological trends of gastrointestinal cancers in a Haitian cancer program. *Ann. Oncol.* 2019 Jul;30 Suppl 4:074.

10. Wang C, Yuan Y, Hunt RH. The association between *Helicobacter pylori* infection and early gastric cancer: a meta-analysis. *Am J Gastroenterol.* 2007 Aug;102(8):1789–98.