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Prevalence and risk factors for *Helicobacter pylori* infection: experience of a Moroccan center

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ABSTRACT

Summary:

H. pylori infection remains endemic in developing countries. The prevalence found in our study was approximately 68%; the risk factors for transmission of this infection that have been reported in the literature are promiscuity, the number of people sleeping under the same roof, the size of the siblings, a lack of hygiene and a low socio-economic level.

Our observational case-control bicentric study with prospective data collection. It was conducted over a period of 36 months, from July 2021 to May 2024 at the Moulay Ismail Meknes Military Hospital.

This retrospective study compared exposure to contamination factors with HP infection in HP+ and HP- patients.

Our study found a significant association between promiscuity, poor hygiene and smoking and HP test positivity, with odds ratios of (OR: 2.87, 2.81, 3.47) (95% confidence interval [CI]) respectively.

However, no difference was observed in the socio-economic levels of the H. pylori positive or H. pylori-negative groups (OR: 1.4; 95% CI).

KEYWORDS

retrospective case-control study, case-control study, contamination, risk factors, helicobacter pylori

MAIN ARTICLE

INTRODUCTION:

Helicobacter pylori (*H. pylori*) is a Gram-negative bacterium that inhabits the gastric environment of more than half the world's population [1] and more than 80% in developing countries [2].

This infection causes inflammation of the stomach tissue, leading to a gastric ulcer. If not treated properly, it can lead to chronic infection or predispose individuals to gastric cancer, the third most deadly type of cancer, but most worryingly, 75% of gastric cancer cases are due to *H. pylori* infections [3].

Infection most often occurs before the age of 20 by two routes: orally or via the faeces. This transmission implies proximity, which is why *H. pylori* is most often transmitted within the same family, particularly in the parent-child direction or between children [4].

Factors favouring transmission include communal living, eating and cooking habits, and poor socio-economic conditions and hygiene: no toilet in the home, no running water, poor hand hygiene after using the toilet [5].

Our study will analyse these risk factors for contamination.

MATERIALS AND METHODS

This is a bicentric observational case-control study with prospective data collection. It was conducted over a 36-month period, from July 2021 to May 2024, at the Moulay Ismail Meknes Military Hospital.

This retrospective study compared exposure to contamination factors with HP infection in HP+ and HP- patients.

Study population and selection of cases and controls :

Cases: all patients seen during the study period with digestive symptoms requiring screening and investigation for *H. pylori* infection.

According to international recommendations, either invasive methods (oesogastroduodenal fibroscopy with biopsy) or non-invasive methods: HP serology, stool testing for HP antigen or the urea breath test with a positive result for HP.

Controls: all patients received during the study period who were not recommended for hp testing and who had undergone oesogastroduodenal fibroscopy with a negative result.

Verbal informed consent was obtained from patients prior to inclusion. Only patients who agreed to participate voluntarily in the survey were included in this study.

Data collection :

The data was collected prospectively during the study period. A survey form was used to collect the data. Data was collected by the department's gastroenterologists.

Definitions of variables :

The dependent variable was the result of testing for HP, either by invasive methods (oesogastroduodenal fibroscopy with biopsy) or non-invasive methods: HP serology, stool testing for HP antigen or urea breath test.

The independent variables were :

- Demographic data (age, sex, marital status, number of people living under the same roof) promiscuity was defined as the number of people living under the same roof exceeding 10.
- Socio-economic data: level of education, annual income, housing, etc.
- The low socio-economic level was defined by the social indicators of the Moroccan High Commission for Planning: no higher education, annual income below the average income (2,500 euros per year in urban areas, 1,500 euros per year).
- Hygiene data: poor hygiene is defined by the WHO:
- Unsanitary state of the kitchen or lack of use of chlorine or use of untreated water
- Active and passive smoking

Methods and statistical analysis: the data were entered into Excel and analysed using EPI info software. Categorical variables were expressed as percentages. Continuous variables were expressed as mean and standard deviation. We consider p less than 0.05

RESULTS

Of the 147 people examined during the study period, we identified 100 cases of *Helicobacter pylori* infection. We therefore studied 100 HP-positive patients and 90 controls.

The prevalence of cases was 68.02%. Of the 100 infected patients, 56 (56%) were women and 44 (44%) were men.

men; the mean age was 47.2 years (31-64 years).

HP was diagnosed on pathological examination in 48 patients, 27 by a positive urea breath test, 13 by positive HP serology and 12 by the presence of HP antigen in the stool. 57 patients lived in rural areas and 47 in urban areas.

Of the 100 patients studied, 64 had associated disorders, including 36 with diabetes, 28 with heart disease and 12 with dyslipidaemia.

The reasons for screening positive patients for HP were: epigastralgia in 52 patients, dyspeptic syndrome in 28 patients, chronic vomiting in 18 patients, while the rest of the patients had different reasons, such as anaemia and altered general condition, which prompted oesogastroduodenal endoscopy (Figure 1).

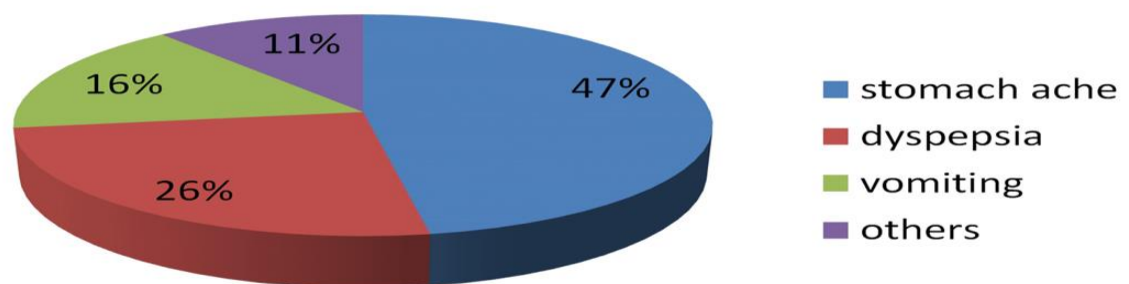


Figure 1 : graph showing the different symptoms of HP research

As mentioned above, the diagnosis of *Helicobacter pylori* infection was confirmed by pathological examination in 48 patients on Sydney protocol gastric biopsies taken during oesogastroduodenal endoscopy, with the following results: pangastritis in 31 patients (64.5%), 18 of which were micronodular, duodenal ulcer in 12 patients (25%) and oesophagitis in 2 patients, while fibroscopy was normal in 3 patients (6%). (figure 2)

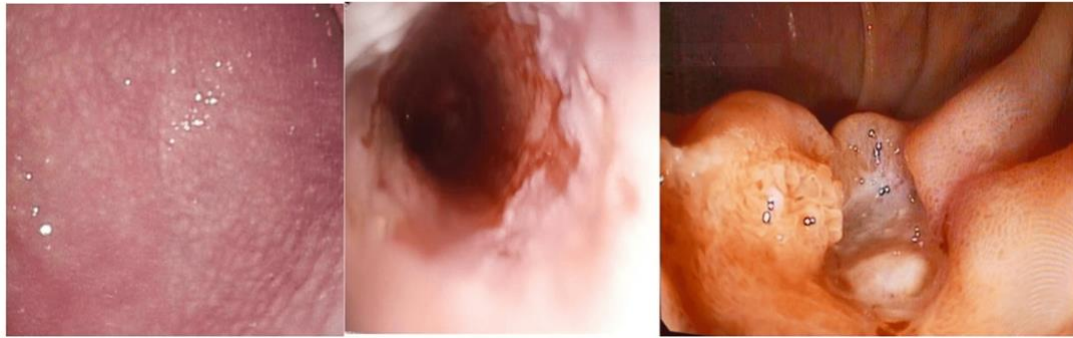


Figure 2 : Image showing the different endoscopic results found during the search for HP 1- Micronodular antritis 2- Esophagitis 3- Bulbar ulcer

The association between the presence of HP and promiscuity, poor hygiene and smoking was significant, with odds ratios of (OR: 2.87, 2.81, 3.47) (95% confidence interval [CI]) respectively. (table 1).

Cases / Witnesses FDR	HP + N= 100		HP - N= 90		OR
	expose	Not on display	expose	Not on display	
Tobacco	67	33	34	56	3,34
Low socio- economic level	53	47	39	51	1.47
Poor food hygiene	61	39	32	58	2,83
Promiscuity	59	41	30	60	2,87

Table 1 : The association between the presence of HP and promiscuity, poor hygiene and smoking was significant, with odds ratios of (OR: 2.87, 2.81, 3.47) (95% confidence interval [CI]) respectively

DISCUSSION

This is the first national study to assess the effect of socio-demographic factors on the development of *H. pylori* infection.

The prevalence of HP in our study was 68.02%, with a slight female predominance (56%); the mean age was 47.2 years (31-64 years).

H. pylori infection affects approximately 50% of the world's population. [6] However, its prevalence varies from one country to another[7,8]. In several countries, rates of *H. pylori* infection have fallen as living standards have improved, while prevalence remains high in most developing countries. [9,10]

In Japan, prevalence was close to 90% in individuals born before 1950, but with a subsequent downward trend to less than 50%.

More than 2% in children born after 2000. [11]

In China, the prevalence of *H. pylori* infection ranged from 41.5% to 72.3%.

varying according to socio-economic status and level of hygiene, [12] confirming the impact of socio-economic and demographic factors on *H. pylori* infection.

Risk factors reported in the literature include overcrowding, number of people sleeping under the same roof, sibling size, poor hygiene, gender and level of education [2,13,14].

A descriptive cross-sectional study was conducted over a 12-month period, from July 2017 to June 2018 in the commune of Sèmè Podji, (on the southern outskirts of Cotonou) in Benin.

This study found no significant association between these different factors and *H. pylori* infection [15]. However, in our study, the association between the presence of HP and promiscuity, poor hygiene and smoking was significant, with odds ratios of (OR: 2.87, 2.81, 3.47) respectively (95% confidence interval [CI]).

However, no difference was observed in the socio-economic levels of *H. pylori* positive and non-positive patients.

H. pylori negative groups (OR: 1.4; 95% CI).

CONCLUSION

H. pylori infection remains endemic in developing countries. The prevalence found in our study was approximately 68%; the risk factors for transmission of this infection reported in the literature are promiscuity, the number of people sleeping under the same roof, the size of the siblings, lack of hygiene and a low socio-economic level.

Our study revealed a significant association between promiscuity, poor hygiene, smoking and HP test positivity.

LIMITATIONS: THE LIMITATIONS OF THIS WORK:

the variability of information gathered by the department's doctors

WHAT IS ALREADY KNOWN ABOUT THIS SUBJECT:

- helicobacter pylori is a frequent infection in developing countries
- the risk factors for contamination are: low socio-economic status and promiscuity.

WHAT THIS STUDY ADDS:

- Statistical and analytical study on HP in MOROCCO
- Evaluation of risk factors for HP contamination in MARIC

TABLES AND FIGURES :

Figure 1 : graph showing the different symptoms of HP research

Figure 2 : Image showing the different endoscopic results found during the search for HP 1- Micronodular antritis 2- Esophagitis 3- Bulbar ulcer

Table 1 : The association between the presence of HP and promiscuity, poor hygiene and smoking was significant, with odds ratios of (OR: 2.87, 2.81, 3.47) (95% confidence interval [CI]) respectively

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