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Helicobacter Pylori Infection in Brazzaville: Comparative Study of Two Identification Tests

Ngala Akoa Itoua-Ngaporo[1,2], Lucie Charlotte Atipo Ibara Ollandzobo Ikobo[2,3], Arnaud Mongo-Onkouo[1,2]*, Jile Florent Mimiesse Monamou[1,2], Clausina Philestine Ahoui Apendi[1,2], Rody Stéphane Ngami[1,2], Marlyse Ngalessami Mouakosso[1], Deby Gassaye[1,2], Blaise Irenée Atipo Ibara[1,2], Jean-Rosaire Ibara[1,2]

[1]Department of Hepatogastroenterology and Internal Medicine of Brazzaville University Hospital Center, Brazzaville, Congo
[2]Faculty of Health Sciences, Marien Ngouabi University, Brazzaville, Congo
[3]Department of Infant Pediatrics of Brazzaville University Hospital Center, Brazzaville, Congo
Email: *schaia1985@gmail.com

Abstract

Objective: To determine the place of two identification tests for Helicobacter pylori infection available in Congo. **Materials and Methods:** This was a comparative study carried out in two digestive endoscopy centers in Brazzaville from 1 January to 31 May 2018. Symptomatic patients referred for upper gastrointestinal endoscopy were included systematically. The frequency of infection was determined from two identification tests, namely the rapid urease test in gastric biopsies and the detection of antigen (Ag) for the germ in the stool. The criterion for judging the presence of the germ in each patient was the positivity of at least one of the two tests. The McNEMAR X^2 test (p < 0.05) was used for the comparison of averages. **Results:** During the study period, 137 consenting patients were included, including 62 men and 75 women. The overall incidence of Helicobacter pylori (Hp) infection was 79.6% (109/28). Of the 137 patients, 18 were urease positive only; 6 were looking for Hp Ag in the stool, and 85 were in the two tests. The frequency of infection was 75.2% (103/137) with the rapid urease test and 66.4% (91/137) with the Hp Ag test in stool. The rapid urease test proved more reliable in the diagnosis of Helicobacter pylori infection than the stool antigen test.

Keywords

Helicobacter Pylori, Identification Tests, Brazzaville

1. Introduction

Helicobacter pylori infection is the most common in the world and especially in

developing countries [1] [2] [3]. This is a real public health problem in Congo because of the existence of certain factors such as promiscuity, low socio-economic level, lack of hygiene which increases the incidence and prevalence of this infection [4] [5]. Its role in the occurrence of gastroduodenal disorders is now well established, as is the case with gastroduodenal ulcerative disease and gastric cancer [6] [7] [8]. The identification methods of Helicobacter pylori are numerous; the choice of the test depends on its performance, its availability but also the cost and other factors that can influence the results [1] [9]. In Congo, the pathological study, the marked urea test, the PCR and the culture are not available; the serology is expensive and is not always predictive of an ongoing infection. The objective of the study was therefore to determine the place of two accessible patient tests used in the diagnosis of this infection in a country with limited resources, such as ours, namely the rapid urease test in gastric biopsies and the detection of the germ antigen in the stools of patients.

In 2013, a similar study conducted in Pakistan seeking to standardize the Hp stool examination method in adults found a better detection sensitivity of Hp infection in stool examination than in gastric biopsies and conversely a better specificity for rapid urease test [10].

2. Materials and Method

This was a comparative study, carried out from January 1st to May 31st, 2018, in two digestive endoscopy centers in Brazzaville. Included were all symptomatic patients with an indication of upper gastrointestinal endoscopy. Patients who took a proton pump inhibitor (PPI) and/or antibiotic one month before endoscopy were not included. Patients who could not perform complete digestive endoscopy or biopsy were excluded from the study. We performed consecutive, non-probability sampling of patients meeting the inclusion criteria during the period. The frequency of Hp infection was determined from two tests. In the endoscopy room, by the rapid urease test "GOLD Hpdry$^{®}$" from two biopsies about 0.5 mm in diameter taken from the mucosa antral and fundic. In the laboratory of the various centers, using the "CerTest Hp$^{®}$" detection kit in the fresh stools of patients, previously collected in a sterile bottle and deposited within one hour of their emission. The criterion for judging the presence of Hp in each patient was the positivity of at least one of the two tests. The performance of the two techniques was judged by the number of positive results obtained, taking into account their respective sensitivity/specificity of 98%/97% and 94%/99% according to the manufacturers. The percentages observed for each sample were compared from a contingency table, using the McNEMAR X^2 test at the 5% threshold [11].

3. Results

During the study period, 137 consenting patients were included, including 62 men and 75 women, a sex ratio of 0.8.

After the two tests were performed, 109 patients were positive and 28 negative, giving an overall incidence of Hp infection of 79.6%. Table 1 reports the carrying frequency of both tests.

Of the 137 patients, 18 were only urease positive, six were only looking for Hp Ag in the stool and 85 were positive in both tests. The performances of the two techniques differed statistically (P = 0.019).

The rapid urease test was more sensitive than the stool test. Table 2 presents the distribution of the results of the two techniques for identifying Hp infection in the study population.

4. Discussion

The limits of this work are the absence of anatomopathological study of the pieces of gastric biopsies and the size of the sample which is weak for lack of financial means. This would have ensured better diagnostic performance and determination of the prevalence of infection by the application of both tests.

In order to optimize the reliability of the results and to evaluate their respective diagnostic performance, we opted for the use of two Helicobacter pylori research tests available in Congo, namely the rapid urease test based on gastric biopsies and the antigen detection test in the stool.

These means of diagnosis are traditional in some works, in particular they were used in a study on the diagnosis of Hp infection in 2013 in Brazil [10] and in Morocco in 2014 [12].

The high frequency of Hp infection in our work corroborates the data from the literature. Indeed, this result is comparable to those obtained in studies conducted in other developing countries. This is the case of Shmuely *et al.* in Nakuru (Kenya), which obtained a frequency of 71% in 2013 [13]. Werme *et al.*

Table 1. Frequency of carrying both tests.

TESTS	NEGATIVE		POSITIVE	
	n	%	n	%
Urease (n = 137)	34	24.8	103	75.2
Ag fecale (n = 137)	46	33.6	91	66.4
Combination of two tests	28	20.4	109	79.6

Table 2. Distribution of the results of the two tests in the study population.

VARIABLES	Urease positive (n = 91)		Urease negative (n = 46)	
	n	%	n	%
Positive Ag (n = 103)	85	82	6	17
Negative Ag (n = 34)	18	18	28	83
TOTAL	91	100	46	100

X^2 de McNEMAR = 6; (p = 0.019).

reported a frequency of 91.4% in Ouagadougou in 2015 [14], while Oling *et al.* Obtained only 36% in Kampala (Uganda) the same year but related the weakness of this frequency to longer duration of their study [15].

Our study showed the superiority of rapid urease test over that of Hp Ag research in stool. Our results could be explained by several reasons, namely the sensitivity of the urease test which is higher than that of the search for the antigen or the existence of false negatives or false positives in the two tests.

On the other hand, the six negative urease test positive antigen tests could be justified by the lack of biopsies taken from sites where there was no germ. Indeed, the Sydney protocol has not been applied in this study [15].

However, it emerges that to accurately assess the sensitivity and specificity of our tests; it would be preferable to associate them with a third, much more efficient test, namely pathological examination or culture and/or PCR, unfortunately not available in our country. This is the case of Chehter *et al.* in 2013, which found a sensitivity and specificity of 87.2% and 44% respectively for stool examination, compared to 65.6% and 58.8% for the rapid test urease and 100%/80.8% for culture in a study seeking to standardize the Hp test method by stool examination in adults [10]. In a study conducted in 2014, Karire Nadège obtained a sensitivity and specificity of the Hp identification test in stools that were better than that of the urease test but lower than the pathological examination [12].

5. Conclusion

These results make it possible to suggest the use of the rapid urease test when oesogastroduodenal endoscopy is indicated and that pathological examination is not possible, to use the test for the detection of Hp antigen in the stool for post-treatment control if the labeled urea breath test is not accessible.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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