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The incidence of infection, diagnosis and treatment of *H. pylori* in developing countries on the example of Kenya


Dominik Machaj, Sandra Jastrzębska, Katarzyna Cyboran, Alicja Placzek, Wiktoria Flaumenhaft

Name Dominik Machaj 
Affiliation Faculty of Medicine, Medical University of Lublin, Chodźki Street 19, 20-093 Lublin
Country Poland
Bio Statement —
Principal contact for editorial correspondence.

Name Sandra Jastrzębska 
Affiliation Faculty of Medicine, Medical University of Lublin, Chodźki Street 19, 20-093 Lublin
Country Poland
Bio Statement —

Name Katarzyna Cyboran 
Affiliation Medical Faculty, Institute of Medical Sciences, Collegium Medicum,
Oleska Street 48, 45-052 Opole
Country Poland
Bio Statement —

Name Alicja Płaczek 
Affiliation Medical Faculty, University of Rzeszow, Pigońia
Street 6, 35-310 Rzeszow
Country Poland
Bio Statement —

Name Wiktoria Flaumenhaft 
Affiliation Medical Faculty, University of Rzeszow, Pigońia
Street 6, 35-310 Rzeszow
Country Poland
Bio Statement —

Abstract

Introduction:

One of the most common causes of bacterial infections in the world is *Helicobacter pylori*. It has developed mechanisms that allow it to survive in the acidic pH of the stomach. The bacterium contributes to the incidence of gastric ulcer and duodenal ulcer. Infected is about 50% of the world population, while in Africa the proportion is as high as 80%. Despite this there are still number of African guidelines for infection prevention and eradication of the bacterium. Most infections concerns children, adolescents and the elderly.

Data on the diagnosis and treatment of patients in Kenya are inconsistent. [1] Doctors are based on international recommendations. No general insurance and a low level of affluence prevent diagnosis of patients at the level of developed countries. Access to endoscopy, and cultures have only wealthy people in big cities.

Purpose: Examine the percentage of *Helicobacter pylori* infection among the people of Kenya, the analysis of the causes of its high value, comparing the diagnosis and treatment with European standards.

Material and methods

Analysis of causes of hospitalization in 227 hospital patients in Kenya. The majority of them has made winning the test of *H. pylori* antigen in stool. Analysis of the results of research carried out in 2010 Subdepartment Medical Microbiology, Jomo Kenyatta University of Agriculture and Technology in Nairobi, Kenya, where the diagnostic methods was rapid urease test and histological tests.

Conclusions

The proportion of patients infected with *H. pylori* in Chuka is 51.9%. Cause of inflammation of the stomach in almost 1/3 of hospitalized patients may be awareness of hygiene and drinking water unsuitable for consumption. Standards of treatment of patients infected with *H. pylori* do not differ from European guidelines.

Key words: *Helicobacter pylori*, Treatment, Diagnosis, Kenya, gastritis

Introduction

Helicobacter pylori is a Gram-negative bacterium inhabiting the cylindrical surface of the epithelial monolayer stomach. For the first time have isolated it in 1983, Warren and Marshall. [2] It is the cause of chronic inflammation of the mucous membrane covering the epithelium colonized by *H. pylori*. Survival in the acidic environment of the stomach, it is possible by producing urease. This enzyme is about 6-10% of the proteins synthesized by the organism. [5,6] It decomposes urea present epithelium of the stomach to carbon dioxide and ammonia, which neutralizes acidic pH of the stomach around the bacteria. Infection occurs by ingestion usually within the first year of life and remained untreated not likely to auto-eradication. [3] Among the risk factors are: poor hygiene, living in developing countries, bad social conditions - economic, racial and genetic predisposition. More often ill black race. In the vast majority of infected do not observe clinically significant complications, while *H. pylori* contributes to the development of diseases of the upper gastrointestinal tract such as gastric and duodenal ulcers occurring in 1-10% of infected people, stomach cancer at 0.1-3% and MALT lymphoma - mucosa-associated lymphoid tissue-derived lymphoid tissue of the gastric mucosa in <0.01%. [4]

Upper gastrointestinal complaints are common in Kenya. These include dyspepsia, dyspehagia, flatulence, heartburn, epigastric pain and haematemesis. Problems with the digestive system in 2000-2010 in Africa was one of the three main reasons for hospitalization (11% of admissions). Ahead of them only infectious disease and cardiovascular disease. [7] According to the survey data published in the years 1970-2016 made by Hooi JKY on the prevalence of *H. pylori* infection in the world in Africa reported the highest rate of *H. pylori* infections with an incidence of 70.1%, followed by 69.4% in South America and West Asia 66, 6%. The authors reported that in Nigeria prevalence of *H. pylori* was 87.7% [11].

Consolata Hospital in Chuka suspicion of gastritis by hospital staff in the period from June to August 2019 year was the cause, up 32% admissions. Chuka is a town in Kenya's population of 12 thousand inhabitants. The hospital does not have a single doctor employed. Patients care of four medical officers, people who graduated like medicine, but items containing surgical and unforeseeable title or the full right to practice medicine.

Purpose: Examine the percentage of *Helicobacter pylori* infection among the people of Kenya, the analysis of the causes of its high value and a reference to the results of research carried out on Jomo Kenyatta University of Agriculture and Technology in Nairobi, Kenya. Comparison of diagnosis and treatment with European standards.

Material and methods

The study involved 227 patients in a hospital in Kenya aged 16 to 87 years hospitalized in the period from June to August 2019 year. The age structure shows a table 2. These Chuka inhabitants numbering about 12 thousand inhabitants and the surrounding countryside. In 72 of them were diagnosed gastritis, in 27 confirmed infection with *H. pylori*. They are taken for this purpose winning antigen test bacteria in the feces. This method is characterized by high sensitivity and specificity comparable to a breath test. The data obtained were compared with the results of research carried out in 2010 Subdepartment Medical Microbiology, Jomo Kenyatta University of Agriculture and Technology in Nairobi, Kenya, where the diagnostic methods was rapid urease test and histological tests.

Results

In 72% of patients with gastritis it is made test of *H. pylori* antigen in the feces. In 51.9% (Table 1) of them tested positive, which gives a similar result to the tests carried out on Subdepartment Medical Microbiology, Jomo Kenyatta University of Agriculture and Technology, Nairobi, where in 2010 the percentage was 54.8% among adults and among children 73.3%. Then they made to patients with dyspepsia gastroscopy and research clippings used rapid urease test and histological tests. Also assumes cultures in order to assess the susceptibility of *H. pylori* to antibiotics. All the *H. pylori* investigated in this study were sensitive to clarithromycin (100%, at least Inhibiting Concentration (MIC) <2 microg / ml), amoxicillin (100% MIC <2 microg / ml) and metronidazole (95.4% MIC < 8 microg / ml). There was, however, occasional resistance to metronidazole (4.6% MIC > 8 microg / ml). [8] The largest gastritis observed in the age group of 0-20 years of age and people over 40 years of age. The smallest in the age group 21-40 years (Table 2). This may be related to less attention paid to the hygiene of the children and the elderly.

Table 1. Patients with gastritis

June-August 2019							
	Admission with gastritis / total admission	gastritis			H. pylori stool antigen test		
		Acute	Protect	Acute or protect (undiagnosed)	positive	Negative	non tested
Women	60/145	27	6	27	24	twenty	16
Man	12/82	7	0	5	3	5	4
Total	72/227	34	6	32	27	25	20
		72 (100%)			(37.5%) (51.9%) *	(34.7%) (48.1%) *	(27.8%) (%)

*% Of the people surveyed

Table 2. Structure of gastritis

Age structure		
Age in years	Number of patients with gastritis	percent
0-20	twenty	27.8%
21-40	4	5.6%
41-60	19	26.4%
61-80	23	31.9%
80 <	6	8.3%

Discussion

The hospital in the small town has only Chuka assay detecting the antigen in feces. Its advantage is certainly high predictive value, but during PPI treatment and after antibiotic treatment, or after application of the formulations of bismuth possible false negative results [4]. It should also mention the discomfort of patients Outpatient Department, who received the referral mentioned in the survey have to give him the material in a hospital toilet, then take it to the lab. After several minutes of receiving the result and head back to the doctor's office. Residents of Chuka prefer to act in this way because stool samples vestibule of the house the next day would require paying another visit to the clinic. The hospital does not have the capacity to perform endoscopy and other tests to detect *H. pylori*. This is due to the material status Chuka residents who can not afford insurance and must cover 100% of the cost of treatment. Buying endoscope would pay the hospital. In the centers of higher referentiality are also available serological tests, urea breath test, and also mentioned before endoscopy with urease test, histological examination, as well as culture.

Indications for testing for the presence of *Helicobacter pylori* according to the American College of Gastroenterology are: active stomach ulcer or duodenal ulcer, or active peptic ulcer disease, in an interview, if not used in the past *H. pylori* eradication therapy, gastric MALT lymphoma, endoscopic resection of gastric cancer at an early stage in the past and dyspepsia without prior diagnosis. [9] Maastricht III Consensus report complements the indication of the presence of gastric cancer in first-degree relative, atrophic gastritis, iron deficiency anemia of unknown etiology and chronic idiopathic thrombocytopenic purpura. Consolata Hospital in Chuka indications for this test is the presence of symptoms such as abdominal pain, heartburn, acid reflux, nausea, vomiting.

On the African continent there are no recommendations regarding the treatment of *H. pylori* in all its countries. In Kenya also lacks these guidelines. Doctors and medical officers are based on international guidelines. Patients were given a triple therapy (PPI unless so is called), clarithromycin and amoxicillin or metronidazole for 7-14 days. Sometimes they are also suitable salts of bismuth and tetracycline. The most used product in the Consolata Hospital Seaweed is a ternary drug, a combination of clarithromycin, amoxycillin and omeprazole. The duration of treatment is 10 days. Some patients in Kenya having adequate knowledge heals itself. In this country the only valid prescription for narcotic drugs. Other drugs can be purchased in any amount without holding a medical advice and get a prescription.

Conclusions

Although, according to research among all the continents highest percentage of people infected in Africa occurs, the data should be given with caution, however. The most common testing used for their preparation was a blood serology, the detection of the antibody against this bacterium. This test does not determine, however, whether the patient is currently infected, or had contact with *H. pylori* in the past. [12] In addition, these studies were performed most often in people with symptoms of the stomach or duodenum, which also suggests that the actual proportion of infected with this bacterium in Africa is lower than the statistics indicate. [1] The work on the infection and transmission of *Helicobacter pylori* suggests possible transmission routes such as person-person oral and oro-faecal-oral. It can be transmitted by water, This pathogen can survive in it a couple of days. [13,14] can be assumed that the reason for such a large number of *H. pylori* in Seaweed is a low level of consciousness, hygiene and drinking unboiled water. A significant part of the population no access to running water in the village does not have a sewage treatment plant, and the channel drain contaminated water from the city flows into the same river from which the water is taken to the municipal network and is in no way treated drinking. Low level of society wealth of African countries and the lack of universal health insurance prevents the accurate diagnosis of patients, but the treatment of gastric ulcers and *H. pylori* eradication does not deviate from the standards of developed countries. Chuka pylori is the low level of awareness of hygiene and drinking unboiled water. A significant part of the population no access to running water in the village does not have a sewage treatment plant, and the channel drain contaminated water from the city flows into the same river from which the water is taken to the municipal network and is in no way treated drinking. Low level of society wealth of African countries and the lack of universal health insurance prevents the accurate diagnosis of patients, but the treatment of gastric ulcers and *H. pylori* eradication does not deviate from the standards of developed countries. Chuka pylori is the low level of awareness of hygiene and drinking unboiled water. A significant part of the population no access to running water in the village does not have a sewage treatment plant, and the channel drain contaminated water from the city flows into the same river from which the water is taken to the municipal network and is in no way treated drinking. Low level of society wealth of African countries and the lack of universal health insurance prevents the accurate diagnosis of patients, but the treatment of gastric ulcers and *H. pylori* eradication does not deviate from the standards of developed countries. from which the water is taken to the municipal network and is in no way treated drinking. Low level of society wealth of African countries and the lack of universal health insurance prevents the accurate diagnosis of patients, but the treatment of gastric ulcers and *H. pylori* eradication does not deviate from the standards of developed countries. from which the water is taken to the municipal network and is in no way treated drinking. Low level of society wealth of African countries and the lack of universal health insurance prevents the accurate diagnosis of patients, but the treatment of gastric ulcers and *H. pylori* eradication does not deviate from the standards of developed countries.

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