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CREDIBILITY OF APPLICATION OF VARIOUS TESTING METHODS FOR CHELICOBACTERIAL INFECTION IN PATIENTS WITH CHRONIC NONATROPHIC GASTRITIS, SUFFICIENT AND NOT SUFFICIENT OF CHRONIC CONSTIPATION

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ДОСТОВІРНІСТЬ ЗАСТОСУВАННЯ РІЗНИХ МЕТОДІВ ТЕСТУВАННЯ НА ХЕЛІКОБАКТЕРНУ ІНФЕКЦІЮ У ХВОРИХ НА ХРОНІЧНИЙ НЕАТРОФІЧНИЙ ГАСТРИТ, ЯКІ СТРАЖДАЮТЬ І НЕ СТРАЖДАЮТЬ НА ХРОНІЧНІ ЗАКРЕПИ

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ДОСТОВЕРНОСТЬ ПРИМЕНЕНИЯ РАЗЛИЧНЫХ МЕТОДОВ ТЕСТИРОВАНИЯ НА ХЕЛИКОБАКТЕРНУЮ ИНФЕКЦИЮ У БОЛЬНЫХ ХРОНИЧЕСКИМ НЕАТРОФИЧЕСКИМ ГАСТРИТОМ, СТРАДАЮЩИХ И НЕ СТРАДАЮЩИХ ХРОНИЧЕСКИМИ ЗАПОРАМИ

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Summary/Резюме

The reliability of various methods for detecting HP infection was analyzed: testing for HP by ELISA, stool test, HELIK test against double testing (urease test and microscopy of stained smears-prints from 4 topographic zones) in 50 patients with chronic neatrophic gastritis suffering from chronic constipation, and in 50 patients with chronic non-atrophic gastritis who did not suffer from constipation. It was found that the most reliable method in both groups is the HELIK test — 85.7 % and 53.6 % (on average —

67.4 %), in second place is the ELISA method — 53.3 % and 63.3 % (on average — 58.3 %), on the third place — stool — test — 32.1 % and 20.8 % (on average — 26.9 %).

Key words: *chronic non-atrophic gastritis, chronic constipation, urease test, microscopy of stained smears -fingerprints, testing for HP by ELISA, stool test, HELIK test.*

Було проаналізовано достовірність різних методів виявлення HP-інфекції: тестування на HP по ІФА, випорожнення — тест, ХЕЛИК-тест щодо подвійного тестування (уреазний тест і мікроскопування забарвлених мазків-відбитків з 4-х топографічних зон) у 50-ти хворих на хронічний неатрофічний гастрит, які страждали на хронічні запори; і у 50-ти хворих на хронічний неатрофічний гастрит, які запорами не страждали. Було виявлено, що найбільш достовірним методом в обох групах є ХЕЛИК-тест — 85,7 % і 53,6 % (у середньому — 67,4 %), на другому місці — метод визначення по ІФА — 53,3 % і 63,3 % (у середньому — 58,3 %), на третьому місці — випорожнення — тест — 32,1 % і 20,8 % (у середньому — 26,9 %).

Ключові слова: *хронічний не атрофічний гастрит, хронічні закрепи, уреазний тест, мікроскопування забарвлених мазків-відбитків, тестування на HP по ІФА, випорожнення — тест, ХЕЛИК-тест.*

Была проанализирована достоверность различных методов выявления HP-инфекции: тестирование на HP по ИФА, стул-тест, ХЕЛИК-тест относительно двойного тестирование (уреазный тест и микроскопирование окрашенных мазков-из 4-х топографических зон) у 50-ти больных хроническим неатрофическим гастритом, страдающих хроническими запорами, и у 50-ти больных хроническим неатрофическим гастритом, которые запорами не страдали. Было выявлено, что наиболее достоверным методом в обеих группах является ХЕЛИК-тест — 85,7 % и 53,6 % (в среднем — 67,4 %), на втором месте — метод определения по ИФА — 53,3 % и 63,3 % (в среднем — 58,3 %), на третьем — стул — тест — 32,1 % и 20,8 % (в среднем — 26,9 %).

Ключевые слова: *хронический неатрофический гастрит, хронические запоры, уреазный тест, микроскопирование окрашенных мазков-отпечатков, тестирование на HP по ИФА, стул-тест, ХЕЛИК-тест.*

Introduction

Chronic constipation today is considered a problem of the century, as their prevalence in recent decades has increased significantly (prevalence in the world ranges from 0.7 % to 40 %) and amounts to 30 % among children aged 6-12 years and from 10 to 50 % of the adult population of developed countries [14]. More often constipation affects people of older age groups, mainly women. [10, 11, 15, 16].

From the position of the formation of a proteolytic cascade of digestion in the gastrointestinal tract, problems of the large intestine cannot be torn off from stomach problems [5]. The discovery in 1983 by the Australian scientists B. Marshall and J.Worenn of the bacterium Helicobacter pylori (HP) revolutionized the understanding of the etiology and pathogenesis of chronic non-atrophic gastritis, peptic ulcer disease and gastric cancer [4], therefore, timely detection of HP in-

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fection, high-quality anti-Helicobacter therapy and restoration of the proteolytic cascade will solve, from our point of view, the problem of chronic constipation.

Today, there are a number of methods for diagnosing HP infection: by the level of immunoglobulins in the blood (enzyme-linked immunosorbent assay (ELISA), urease test, microscopy of stained smears, fingerprints, stool test, by the level of exhaled ammonia (HELIK test) [3, 5, 12, 13, 17], however, in the literature available to us there are no comparative data on the reliability of various methods for detecting HP infection in patients with chronic non-atrophic gastritis, suffering and not suffering from chronic constipation, which was the reason for our work.

Purpose of the study

To study the reliability of detection of Helicobacter pylori infection using various methods of testing for HP infection in patients with chronic non-atrophic gastritis, suffering and not suffering from chronic constipation.

Materials and research methods

On the bases of the clinical department of the problem laboratory for chronic helicobacteriosis of the Black Sea National University named after Petro Mohyla (Nikolaev) and SE Ukrainian Research Institute of Transport Medicine of the Ministry of Health of Ukraine, 100 patients with chronic non-atrophic gastritis were comprehensively examined. The first group consisted of 50 patients suffering from chronic constipation, the second — 50 patients who did not suffer from constipation. The age of patients ranged from 18 to 72 years (average age was 40.27 ± 1.08 years). Men were 40 people (40 %), women — 60 people (60 %).

The study was conducted in accordance with the basic bioethical provisions of the Helsinki Declaration of the World Medical Association on the ethical principles of scientific 549 medical research involving human (2013) and the order of the Ministry of Health of Ukraine No. 690 dated September 23, 2009.

A comprehensive examination included: stepwise intragastric pH — metry according to the method of V. Chernobrovy, esophagogastroduodenoscopy (EGDS) according to the generally accepted method, double testing for HP: test for urease activity and microscopy of Giemsa-stained fingerprints, the material for which was taken during the test endoscopy from 4 topographic zones: from the middle third of the antrum and body of the stomach according to the greater and lesser curvature according to our methodology, which allows us to determine the presence of intracellular “depots” HP infections, as well as histological studies of the gastric mucosa, the material for which was taken from the same areas, according to the generally accepted method, taking into account the latest classifications [3,9].

The sequence of the examination: after collecting the anamnesis, the patients underwent pH-metry, and then — endoscopy with sampling of biopsy material for testing for HP and histological studies of the gastric mucosa. The study was conducted in the morning, on an empty stomach, 12-14 hours after the last meal.

In addition to a comprehensive examination, other methods of testing for HP were carried out in parallel with the patients: ELISA testing, stool test, breath test (HELIK test) in our modification, the data obtained from which were compared with double testing data from a comprehensive examination [3, 12, 13]. In this article, the authors presented data obtained by comparing the reliability of various methods.

Research results and discussion

The data obtained during the com-

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Table 1

The frequency of detection and the degree of contamination of the gastric mucosa with active and inactive forms of HP infection by topographic zones in patients with chronic non-atrophic gastritis, suffering from chronic constipation, who underwent a stool test (*n* = 28)

Topographic zones of the stomach	Detection frequency, %		The degree of contamination of the gastric mucosa by HP -infection by topographic zones stomach, (+) / (M ± м)	
	active form	inactive form	active form	inactive form
1. Antrum, middle third,greater curvature	14 (50 %)	0 (0 %)	1,29 ± 0,29	0,0 ± 0,0
2. Antrum, middle third, small curvature	14 (50 %)	0 (0 %)	1,18 ± 0,29	0,0 ± 0,0
3. Body of the stomach, middle third, greater curvature	15 (53,6 %)	14 (50 %)	1,39 ± 0,29	1,32 ± 0,29
4. Body of the stomach, middle third, small curvature	15 (53,6 %)	14 (50 %)	1,64 ± 0,29	1,46 ± 0,29

Note: n-the number of studies

Table 2

Results of a stool test in patients with chronic atrophic gastritis, suffering from chronic constipation (*n* = 28)

Positive results of stool test		Negative results of stool test	
Detection frequency	%	Detection frequency	%
9	32,1	19	67,9

Note: n-the number of studies

parative characterization of the obtained data on the detection of HP by double testing and on the stool test are shown in tables 1, 2, 3, 4.

In a comparative analysis of data in patients with positive results of a chair test with data from double testing for HP infection, it was found that in 2 patients (7.1 %), active forms of HP infection were detected on the mucosa with the degree of seeding (++) — (++++); in the first (3.6 %) — a combination of active forms with the degree of seeding (+++) and intracellular "depot" with the degree of seeding with active forms of HP — (+++); in the 1st (3.6 %) — a combination of active forms with the degree of seeding (+++) and inactive forms of the 1st type of HP with the degree of seeding — (+++); in 2 (7.1 %) — a combination of active forms with the degree of seeding (+++), inactive forms of the 1st type of HP with the degree of seeding — (+++) and intracellular "depot" with the degree of

Table 3

The frequency of detection and the degree of contamination of the gastric mucosa with active and inactive forms of HP infection by topographic zones in patients with chronic non-atrophic gastritis, not suffering from chronic constipation, who underwent a stool test (*n* = 24)

Topographic zones of the stomach	Detection frequency, %		The degree of contamination of the gastric mucosa by HP -infection by topographic zones stomach, (+) / (M ± м)	
	active form	inactive form	active form	inactive form
1. Antrum, middle third,greater curvature	10 (41,7 %)	0 (0 %)	1,17 ± 0,21	0,0 ± 0,0
2. Antrum, middle third, small curvature	10 (41,7 %)	0 (0 %)	1,13 ± 0,21	0,0 ± 0,0
3. Body of the stomach, middle third, greater curvature	10 (41,7 %)	14 (58,3 %)	1,21 ± 0,21	1,46 ± 0,16
4. Body of the stomach, middle third, small curvature	15 (62,5 %)	7 (29,2 %)	1,63 ± 0,21	0,79 ± 0,21

Note: n-the number of studies

Table 4

Results of a stool test in patients with chronic atrophic gastritis, not suffering from chronic constipation (*n* = 24)

Positive results of stool test		Negative results of stool test	
Detection frequency	%	Detection frequency	%
5	20,8	19	79,2

Note: n-the number of studies

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seeding with the active forms of HP — (++) — (+++); in 3 (10.7 %) — only inactive forms of type II with a degree of seeding (+++) — (++++).

In a comparative analysis of data in patients with negative results of a chair test with data from double testing for HP infection, it was found that in 3 (10.7 %) patients on the mucosa, active forms of HP infection were detected with a degree of seeding (+) — (+++); in 5 cases (17.9 %) — the combination of active forms with the degree of seeding (+) — (++++) and the intracellular "depot" with the degree of seeding with the active forms of HP — (+++) — (+++ +); in 2 (7.1 %) — a combination of active forms with the degree of seeding (+), inactive forms of the 1st type of HP with the degree of seeding — (+++) — (++++) and intracellular "depot" with the degree of seeding with active forms of HP — (++) — (++++); in 8 (28.6 %) — only inactive forms of type II with the degree of insemination (+) — (+++); in 1 (3.6 %) patients on the gastric mucosa, not a single form of HP infection was detected.

Table 5

The frequency of detection and the degree of contamination of the gastric mucosa with active and inactive forms of HP — infection by topographic zones in patients with chronic non-atrophic gastritis, suffering from chronic constipation, who were tested for HP by ELISA (*n* = 30)

Topographic zones of the stomach	Detection frequency, %		The degree of contamination of the gastric mucosa by HP -infection by topographic zones stomach, (+) / (M ± м)	
	active form	inactive form	active form	inactive form
1. Antrum, middle third,greater curvature	12 (40 %)	0 (0 %)	0,97 ± 0,18	0,0 ± 0,0
2. Antrum, middle third, small curvature	12 (40 %)	0 (0 %)	0,93 ± 0,13	0,0 ± 0,0
3. Body of the stomach, middle third, greater curvature	14 (46,7 %)	14 (46,7 %)	1,17 ± 0,18	1,20 ± 0,18
4. Body of the stomach, middle third, small curvature	13 (43,3 %)	15 (43,3 %)	1,23 ± 0,18	1,37 ± 0,18

Note: n-the number of studies

Table 6

The results of testing HP infection by ELISA in patients with chronic neatrophic gastritis, suffering from chronic constipation (*n* = 30)

Positive results			Doubtful results			Negative results		
Detection rate	%	Average value M ± м /ME/МЛ	Detection rate	%	Average value M ± м /ME/МЛ	Detection rate	%	Average value M ± м /ME/МЛ
16	53,3	135,76 ± 15,83	2	6,7	29,35 ± 0,69	12	40	11,98 ± 0,79

Note: n-the number of studies

In a comparative analysis of data in patients with positive results of a chair test with data from double testing for HP infection, it was found that in 3 patients (12.5 %), active forms of HP infection were detected on the mucous membrane with a degree of seeding (+) — (+++); in the first (4.2 %) — a combination of active forms with the degree of seeding (++++) and intracellular "depot" with the degree of seeding with the active forms of HP — (++++); in the 1st (4.2 %) — a combination of active forms with the degree of seeding (+++) and inactive forms of the 1st type of HP with the degree of seeding (+++) — (++++).

In a comparative analysis of data in patients with negative results of a chair test with data from double testing for HP infection, it was found that in 5 (20.8 %) patients on the mucosa, active forms of HP infection were detected with a degree of seeding (+) — (+++); in 2-x (8.3 %) — — a combination of active forms with the degree of seeding (+) — (+++) and inactive forms of the 1st type of HP with the degree of seeding — (++) — (+++); in 2 (8.3 %) — a combination of intracellular

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"depots" with the degree of contamination with the active forms of HP — (+) — (+++) and inactive forms of the 1st type of HP with the degree of contamination (+++); in the first (4.2 %) — a combination of active forms with the degree of seeding (+++) and inactive forms of the second type of HP with the degree of seeding (++); in 2 (8.3 %) — intracellular "depots" with the degree of contamination with the active forms of HP (+++) and inactive forms of the second type of HP with the degree of contamination (++); in 7 (29.2 %) — only inactive forms of type II with the degree of insemination (+) — (+++).

Table 7

The frequency of detection and the degree of contamination of the gastric mucosa with active and inactive forms of HP — infection by topographic zones in patients with chronic non-atrophic gastritis, not suffering from chronic constipation, who were tested for HP by ELISA (n = 30)

Topographic zones of the stomach	Detection frequency, %		The degree of contamination of the gastric mucosa by HP -infection by topographic zones stomach, (+) / (M ± м)	
	active form	inactive form	active form	inactive form
1. Antrum, middle third, greater curvature	13 (43,3 %)	0 (0 %)	1,23 ± 0,18	0,0 ± 0,0
2. Antrum, middle third, small curvature	13 (43,3 %)	0 (0 %)	1,20 ± 0,18	0,0 ± 0,0
3. Body of the stomach, middle third, greater curvature	13 (43,3 %)	17 (56,6 %)	1,30 ± 0,18	1,50 ± 0,18
4. Body of the stomach, middle third, small curvature	19 (63,3 %)	9 (30 %)	1,73 ± 0,18	0,80 ± 0,18

Note: n-the number of studies

Table 8

The results of testing HP infection by ELISA in patients with chronic non-atrophic gastritis who do not suffer from chronic constipation (n = 30)

Positive results			Doubtful results			Negative results		
Detection rate	%	Average value M ± м /ME/МЛ	Detection rate	%	Average value M ± м /ME/МЛ	Detection rate	%	Average value M ± м /ME/МЛ
19	63,3	144,70 ± 18,13	1	3,4	18,10 ± 0,0	10	33,3	4,67 ± 1,43

Note: n-the number of studies

The total number of positive cases of stool test in both groups was 14 cases (26.9 %).

The data obtained during the comparative characterization of the obtained data on the detection of HP by double testing and ELISA are shown in tables 5, 6, 7, 8.

In a comparative analysis of data in patients with positive results of testing for HP by ELISA with data from double testing for HP infection, it was found that in 3 patients (10 %), active forms of HP infection were detected on the mucosa with the degree of seeding (++) — (+++), in 4 (13.4 %) — active forms of HP with the degree of seeding (+) — (++++) and intracellular "depots" of active forms of HP with the degree of seeding (+++); in the first (3.3 %) — active forms of HP with the degree of seeding (+++) and inactive forms of the 1st type with the degree of seeding (+++); the first (3.3 %) — active forms of HP with the degree of seeding (+++) — (++++), intracellular "depots" of active forms of HP with the degree of seeding (++) and inactive forms I-II –Th type with the degree of seeding (++) — (+++), in 6 (20 %) — only inactive forms of the 2nd type with the degree of seeding (+) — (+++); in the first (3.3 %) — a mixture of inactive forms of type I — II with the degree of seeding (++++).

In a comparative analysis of data in patients with negative results of testing for HP by ELISA with data from double testing for HP infection, it was found that in 2 patients (6.7 %) only active forms of HP infection were detected on the mucosa

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with the degree of seeding (+) — (+++); in 2 (6.7 %) — active forms with the degree of seeding (+) — (+++) and intracellular "depots" with the degree of seeding (+++) — (++++); at the 1st (3.3 %) — active forms at the degree of seeding (+++), intracellular "depots" at the degree of seeding (++) — (+++) and inactive forms of the 1st type at the degree of seeding (+++); 5 (16.6 %) have inactive forms of type II with a degree of seeding (+) — (+++); in 2 (6.7 %) patients on the gastric mucosa, not a single form of HP infection was detected.

Table 9

The frequency of detection and the degree of colonization of the gastric mucosa by active and inactive forms of HP infection by topographic zones in patients with chronic non-atrophic gastritis, suffering from chronic constipation, who underwent a HELIK test (n = 21)

Topographic zones of the stomach	Detection frequency, %		The degree of contamination of the gastric mucosa by HP -infection by topographic zones stomach, (+) / (M ± м)	
	active form	inactive form	active form	inactive form
1. Antrum, middle third,greater curvature	10 (47,6 %)	0 (0 %)	1,24 ± 0,23	0,0 ± 0,0
2. Antrum, middle third, small curvature	9 (42,9 %)	1 (4,8 %)	1,00 ± 0,17	0,14 ± 0,17
3. Body of the stomach, middle third, greater curvature	12 (57,1 %)	10 (47,6 %)	1,33 ± 0,17	1,29 ± 0,23
4. Body of the stomach, middle third, small curvature	12 (57,1 %)	11 (52,4 %)	1,57 ± 0,23	1,43 ± 0,23

Note: n-the number of studies

Table 10

The results of the HELIK test in patients with chronic non-atrophic gastritis, suffering from chronic constipation, which was performed HELIK test (n = 21)

Positive HELIK test results			Negative HELIK test results		
Detection rate	%	Average growth мм / (M ± м)	Detection rate	%	Average growth мм / (M ± м)
18	85,7	7,61 ± 0,78	3	14,3	1,50 ± 0,51

Note: n-the number of studies

In a comparative analysis of data in patients with dubious results of testing for HP by ELISA with data from double testing for HP infection, it was found that in 2 (6.7 %) patients on the gastric mucosa revealed only inactive forms of type II HP infection with degrees of seeding (+++) — (++++).

In a comparative analysis of data in patients with positive results of testing for HP by ELISA with data from double testing for HP infection, it was found that in 5 patients (16.7 %), active forms of HP infection were detected on the mucosa with the degree of seeding (+) — (+++), in the 1st (3.3 %) — active forms of HP with the degree of seeding (++++) and intracellular "depots" of active forms of HP with the degree of seeding (++++); 4 (13.3 %) have active forms of HP with the degree of seeding (+) — (+++) and inactive forms of the 1st type with the degree of seeding (++) — (++++); 1 (3.3 %) had intracellular "depots" of active forms of HP with a degree of seeding (+++); in 2 (6.7 %) — a combination of intracellular "depots" of active forms of HP with a degree of seeding (+++) and inactive forms of the 1st type with a degree of seeding (+++); in 2 (6, 7 %) — a combination of intracellular "depots" of active forms of HP with the degree of seeding (+) — (+++) and inactive forms of the 2nd type with the degree of seeding (++) — (+++); in the first (3.3 %) — a combination of active forms of HP with the degree of seeding (+++) and inactive forms of type II with the degree of seeding (++); in 3 (10 %) — only inactive forms of type II with a degree of seeding (++) — (+++).

In a comparative analysis of data in patients with negative results of testing for HP by ELISA with data from double testing for HP infection, it was found that in 4

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patients (13.3 %) only active forms of HP infection were detected on the mucosa with the degree of seeding (+) — (++++); the first (3.3 %) had active forms with the degree of seeding (+++) and intracellular "depots" with the degree of seeding (+++); at the 1st (3.3 %) — a combination of intracellular "depot" at the degree of seeding (+++) and inactive forms I of the 1st type at the degree of seeding (++); 4 (13.3 %) have inactive forms of type II with a degree of insemination of (+) — (+++).

Table 11

The frequency of detection and the degree of colonization of the gastric mucosa by active and inactive forms of HP infection in topographically zones in patients with chronic non-atrophic gastritis, not suffering from chronic constipation, which was performed by the HELIK test

(n = 28)

Topographic zones of the stomach	Detection frequency, %		The degree of contamination of the gastric mucosa by HP -infection by topographic zones stomach, (+) / (M ± м)	
	active form	inactive form	active form	inactive form
1. Antrum, middle third,greater curvature	8 (28,6 %)	0 (0 %)	0,71 ± 0,14	0,0 ± 0,0
2. Antrum, middle third, small curvature	8 (28,6 %)	0 (0 %)	0,79 ± 0,14	0,0 ± 0,0
3. Body of the stomach, middle third, greater curvature	7 (25 %)	18 (64,2 %)	0,75 ± 0,19	1,82 ± 0,19
4. Body of the stomach, middle third, small curvature	10 (35,7 %)	12 (42,9 %)	0,86 ± 0,14	1,21 ± 0,19

Note: n-the number of studies

Table 12

The results of the HELIK test in patients with chronic non-atrophic gastritis, not suffering from chronic constipation, who underwent a HELIK test (n = 28)

Positive HELIK test results			Negative HELIK test results		
Detection rate	%	Average growth мм / (M ± м)	Detection rate	%	Average growth мм / (M ± м)
15	53,6	8,00 ± 0,93	13	46,4	1,35 ± 0,17

Note: n-the number of studies

A comparative analysis of data in patients with dubious results of testing for HP by ELISA with data from double testing for HP infection revealed that in the 1st (3.3 %) patients on the gastric mucosa only inactive forms of type II HP infection were detected degrees of seeding (+++).

The total number of positive results revealed when using the ELISA technique in both groups was 35 cases (58.3 %).

The data obtained during the comparative characterization of the obtained data on the detection of HP by double testing and the HELIK test are shown in tables 9, 10, 11, 12.

In a comparative analysis of data in patients with positive results of the HELIK test with data from double testing for HP infection, it was revealed that in the 1st (4.8 %) patient on the mucous membrane, active forms of HP infection were detected with a degree of seeding (+++); in 3 (14.3 %) mucous membranes, active forms of HP infection were detected with the degree of seeding (+) — (+++) and active forms in the form of intracellular "depots" with the degree of seeding (++) — (+ ++); in the first (4.8 %) mucosa, active forms of HP infection were detected with the degree of seeding (+), active forms in the form of intracellular "depots" with the degree of seeding (+++) and inactive forms of the 1st type with degree seeding (+++); in 5 (23.7 %) mucous membranes, active forms of HP infection were detected with a degree of seeding (+) — (+++) and inactive forms I — II — type with a degree of seeding (+) — (+++ +); in the 1st (4.8 %) mucous membrane, active forms were revealed in the form of

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intracellular “depots” at the degree of seeding (++) and inactive forms of the 1st type at the degree of seeding (+++); in the first (4.8 %) mucous membrane, active forms were detected only in the form of intracellular “depots” with the degree of seeding (+++) — (++++); in 5 (23.7 %) only inactive forms of type II with an insemination degree of (+) — (+++) were detected on the mucosa; in the 1st (4.8 %) mucosa, a mixture of inactive forms of the I-II — type type was revealed with a degree of seeding (++++).

A comparative analysis of the data in patients with negative results of the HELIK test with data from double testing for HP infection revealed that in the 1st (4.8 %) patient on the mucous membrane, active forms of HP infection were detected with the degree of seeding (+++) and intracellular “depots” with the degree of seeding (+++), in the 1st (4.8 %) active forms were revealed only in the form of intracellular “depots” with the degree of seeding (+++), in the 1st (4.8 %) — single active forms, inactive forms in the form of a mixture of type I-II with a degree of seeding (+++) and intracellular “depot active forms of contamination at a degree (+++).

In a comparative analysis of data in patients with positive results of the HELIK test with data from double testing for HP infection, it was found that in 2 (7.1 %) patients on the mucosa, active forms of HP infection were detected with a degree of seeding (+++); in the first (3.6 %) on the mucosa, active forms of HP infection were detected with the degree of seeding (+++) and active forms in the form of intracellular “depots” with the degree of seeding (+++); in the first (3.6 %) mucosa, active forms of HP infection were detected at the degree of seeding (+++), active forms in the form of intracellular “depots” at the degree of seeding (+++) and inactive forms of type I with the degree of seeding (+++); in the first (3.6 %), active forms in the form of intracellular “depots” were revealed on the mucous membrane with the degree of seeding (+++); in the 1st (3.6 %) mucous membrane, active forms were revealed in the form of intracellular “depots” at the degree of seeding (+++) and inactive forms of the 1st type at the degree of seeding (+++); in 3 (10.7 %) mucous membranes revealed active forms of HP infection with the degree of seeding (+++) and inactive forms of the 1st type with the degree of seeding (+++) — (++++); in the first (3.6 %) mucous membrane, active forms of HP infection were detected with the degree of seeding (+) and inactive forms of I-II type with the degree of seeding (+++); in the 1st (3.6 %) mucous membrane, active forms of HP infection were detected with the degree of seeding (+) and inactive forms of type II with the degree of seeding (+); in 2 (71.1 %), only inactive forms of type II were detected on the mucosa with the degree of seeding (+++) — (++++); in the 1st (3.6 %) mucosa, a mixture of inactive forms of the I-II — type type was detected with a degree of seeding (++++); in one (3.6 %) on the mucosa, no form of HP infection was detected.

In a comparative analysis of data in patients with negative results of the HELIK test with data from double testing for HP infection, it was revealed that in the 1st (3.6 %) patient, active forms of HP infection were detected on the mucosa with the degree of seeding (+), intracellular “depots” at the degree of seeding (++++) and inactive forms of the 1st type at the degree of seeding (+++); in the first (3.6 %), only active forms were found in the form of intracellular “depots” with the degree of seeding (++) and inactive forms of the second type with the degree of seeding (++) — (+++); 9 (32.1 %) have inactive forms of the I-II type with an insemination degree of (+) — (+++); in 2 (7.1 %) on the mucosa, no form of HP infection was detected.

The total number of positive results

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when using the HELIK test in both groups was 33 cases (67.4 %).

These results are explainable from the point of view of the principles of each methodology that were used during testing, as well as the properties of the HP infection itself. Helicobacter pylori infection has two properties that significantly affect the reliability of testing methods — the presence of two forms (active and inactive) and the ability to form an intracellular "depot" in parietal cells with prolonged psycho-emotional stress and the use of proton pump inhibitors [4, 8]. Both properties significantly affect the urease test, HELIK test and stool test, since the first two methods directly depend on the urease activity of HP infection, and the latter on the concentration of active forms of HP on the surface of the gastric mucosa. The presence of inactive forms that have low antigenicity and secrete urease either in a small amount (cocci type I) or not at all (cocci type II), leads to the appearance of a large number of false-negative results, and the presence of intracellular "depots" of HP infection, when the reagents of the urease test and the HELIK test do not have contact with the active form of HP, their number increases [1, 2, 6, 12]. Long-term psycho-emotional stress causes immunosuppression, which causes a decrease in the reliability of this technique due to an inadequate response of the immune system [7].

Conclusions and prospects for further research

1. In patients with chronic non-atrophic gastritis, suffering and not suffering from chronic constipation, the reliability of the HELIK test in both groups was 85.7 % and 53.6 % (on average — 67.4 %), the ELISA method was 53.3 % and 63.3 % (average — 58.3 %), test chair — 32.1 % and 20.8 % (average — 26.9 %).
2. Double testing for HP (urease test and microscopy of stained smears — prints) in 4 topographic zones is the most reliable method for diagnosing HP infection and should be widely implemented in practice.

The prospect of further research is the creation of new methods for testing intracellular "depots" of HP infection in patients with chronic non-atrophic gastritis, suffering and not suffering from chronic constipation.

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