

РАСПРОСТРАНЕННОСТЬ ИНФЕКЦИИ *HELICOBACTER PYLORI* СРЕДИ ЖИТЕЛЕЙ РЯЗАНСКОГО РЕГИОНА

© Т.В. Жесткова¹, М.А. Бутов¹, Ю.Ю. Лымарь², С.В. Папков¹

ФГБОУ ВО Рязанский государственный медицинский университет
им. акад. И.П. Павлова Минздрава России, Рязань, Россия (1)

Центр Молекулярной Диагностики ФБУН ЦНИИ Эпидемиологии Роспотребнадзора,
Рязань, Россия (2)

Цель. Определение распространенности инфекции *Helicobacter pylori* (*H. pylori*) среди населения Рязанского региона. **Материалы и методы.** Обследованы 833 человека (809 взрослых и 24 детей) с использованием иммуноферментного метода выявления антител класса IgG (2017-2018). Критерии включения в исследование: желание пациента пройти обследование на наличие в крови антител к *H. pylori*. Критерии исключения: проведенное в прошлом лечение хеликобактериоза. Наличие хеликобактериоза определяли иммуноферментным методом количественного выявления антител класса IgG (*anti-H. pylori* IgG) тест системой BCM Diagnostics *Helicobacter pylori* IgG (США) и качественного определения IgG антител к *H. pylori* в сыворотке крови на анализаторе IMMULITE 2000 (Германия; тест IMMULITE[®] 2000 *H. pylori* IgG). Чувствительность использованных тест систем > 95,0%, специфичность >98,0%. **Результаты.** Установлена высокая инфицированность взрослых жителей Рязани *H. pylori* – 65,6% (у мужчин – 70,6%, у женщин – 64,4%). Распространённость хеликобактериоза среди взрослых в 2017 г. составила 64,4%, а в 2018 г. – 70,2%, однако наблюдаемое увеличение числа инфицированных лиц было статистически незначимым ($p>0,05$). Наибольшая распространенность хеликобактериоза отмечена у лиц в возрасте ≥ 40 лет (67,2%). Обнаружены гендерные различия в частоте выявления хеликобактериоза у лиц в возрасте 40 лет и старше: инфицированность *H. pylori* среди мужчин ≥ 40 лет составила 75,2% против 65,5% у женщин того же возраста ($p<0,05$). У детей 4-16 лет доля лиц с положительным серологическим тестом *anti-H. pylori* IgG достигала 20,8%. Все инфицированные *H. pylori* дети были старше 9 лет. Лица с положительным результатом серологического теста консультировались гастроэнтерологом, по показаниям им проводилось дополнительное обследование и назначалось эрадикационное лечение. Пациентам с неопределенным результатом повторяли исследование через неделю и/или определяли наличие антигена *H. pylori* в кале. **Заключение.** Полученные данные указывают на высокий уровень инфицированности *H. pylori* взрослого населения в Рязанском регионе – 65,6%. Частота обнаружения *anti-H. pylori* IgG в популяции максимальна у лиц ≥ 40 лет (67,2%).

Ключевые слова: *Helicobacter pylori*, *H. pylori*, инфекция, распространенность.

PREVALENCE RATE OF *HELICOBACTER PYLORI* INFECTION AMONG POPULATION OF RYAZAN REGION

T.V. Zhestkova¹, M.A. Butov¹, Yu.Yu. Lyymar², S.V. Papkov¹

Ryazan State Medical University, Ryazan, Russia (1)

Center of Molecular Diagnostics of Central Research Institute of Epidemiology, Ryazan, Russia (2)

Aim. Determination of the prevalence of *Helicobacter pylori* (*H. pylori*) infection among the population of the Ryazan region. **Materials and Methods.** 833 individuals (809 adults and 24



children) were examined for presence of IgG class antibodies using the enzyme immunoassay (2017-2018). The criteria for inclusion into the study were: a desire of a patient to undergo examination for the presence of antibodies to *H. pylori* in blood. Criteria for exclusion: past treatment for helicobacteriosis. The presence of helicobacteriosis was determined by enzyme immunoassay for quantitative detection of IgG class antibodies (*anti-H. pylori* IgG) using BCM Diagnostics Helicobacter pylori IgG (USA) test system and for qualitative determination of IgG antibodies to *H. pylori* in blood serum on IMMULITE 2000 (Germany; test IMMULITE® 2000 H. pylori IgG). Sensitivity of the used test systems was >95.0%, specificity >98.0%. **Results.** High contamination of adult residents of Ryazan with *H. pylori* – 65.6% was found (70.6% of males, 64.4% of females). Prevalence of *H. pylori* infection among adults in 2017 was 64.4% and in 2018 – 70.2%, however, the observed increase in the number of infected individuals was not statistically significant ($p < 0.05$). The highest prevalence of *H. pylori* infection was observed in individuals ≥ 40 years of age (67.2%). Gender-related differences in the prevalence of *Helicobacter pylori* infection were revealed in individuals of 40 years and older. *H. pylori* infection in males of ≥ 40 years was 75.2%, against 65.5% in females of the same age ($p < 0.05$). In children of 4-16 years, the share of individuals with positive serological test with *anti-H. pylori* IgG reached 20.8%. All *H. pylori* infected children were above 9 years of age. Individuals with positive serological tests received consultation of a gastroenterologist, and on indications underwent additional examination with administration of eradication treatment. In patients with indefinite results the examination was repeated after a week and/or the presence of *H. pylori* antigen in feces was determined. **Conclusion.** The data obtained indicate a high level of infection with *H. pylori* in the adult population in the Ryazan region – 65.6%. The incidence of detection of *anti-H. pylori* IgG in the population was maximal in individuals ≥ 40 years (67.2%).

Keywords: *Helicobacter pylori*, *H. pylori*, infection, prevalence.

In the records of the joint conference Maastricht V it is noted that eradication of *Helicobacter pylori* (*H. pylori*) provides clinical and economic benefits not only in terms of the prophylaxis of gastric cancer, but also in terms of prevention of bleedings and recurrences of gastric ulcer and gastropathy associated with intake of non-steroidal anti-inflammatory drugs, and of dyspepsia [1]. Unfortunately, epidemiological data indicate a high prevalence of helicobacteriosis among the Russian population with the share of infected individuals 78.5% [2].

Therefore, we consider it extremely important to find out the prevalence of *H. pylori* infection among the population of a particular region by comparing the epidemiological data with the data of incidence of helicobacteriosis-related conditions. The obtained information should be used for planning of the prophylactic work and for creation of the economically efficient model of the morbidity, and will also stimulate healthcare managers and

practitioners to strictly observe the existing Russian and international recommendations on diagnosis and treatment of *H. pylori*-related diseases.

The aim of the given work was to study infection of population of the Ryazan region with *H. pylori*.

Materials and Methods

The study was conducted in 2017-2018 at the premises of Center of Molecular Diagnostics of Central Research Institute of Epidemiology, Ryazan. Criteria of inclusion into the study: a desire of a patient to undergo examination for the presence of antibodies to *H. pylori* in blood. Criteria of exclusion: past treatment for helicobacteriosis.

In result, 833 residents of the Ryazan region underwent examination for infection with *H. pylori* including 809 adults at the age from 18 to 88 years (649 females and 160 males), and 24 children from 4 to 16 years. The incidence of helicobacteriosis was studied by examination of patient's blood

serum for the presence of IgG antibodies to *H. pylori* using enzyme-immunoassay. Serological method of determination of *H. pylori* infection is used in Russia for primary diagnosis in 29.7% of cases, and in cases of low bacterial contamination of gastric mucosa it possesses the highest sensitivity in comparison with other methods of identification of helicobacteriosis [1,3]. The presence of IgG antibodies in the patient's blood serum evidences the past infection.

The presence of helicobacteriosis was determined by enzyme immunoassay for quantitative determination of IgG class antibodies (*anti-H. pylori* IgG) using test system BCM Diagnostics Helicobacter pylori IgG (USA), and for qualitative determination of IgG antibodies to *H. pylori* in blood serum on analyzer IMMULITE 2000 (Germany; test IMMULITE® 2000 *H. pylori* IgG). The used systems possess sensitivity >95.0%, specificity >98.0%.

Individuals with a positive result of serological test were consulted by a gastroenterologist, and on indications eradication treatment was administered. Patients with the indefinite result had to repeat the examination and/or were determined the presence of *H. pylori* antigen in feces.

Statistical processing of the material was implemented using software package Microsoft Excel 2010, Statistica 13.0 (Stat Soft Inc., USA). The differences between frequency of variables in groups were analyzed by Pearson criterion χ^2 . The differences were considered statistically significant at $p < 0.05$.

Results and Discussion

Analysis of the examined males showed predomination of individuals of 40-79 years of age in the group (75.0%). The number of females desiring to take part in the examination increased with age reaching maximum at 60-69 years. 74.9% of the examined females were 50-79 years old.

Thus, the highest interest in the examination for helicobacteriosis was seen in the population of 40-79 years old. A high quantity of individuals of the advanced age among

the examined population correlated with the data of Federal State Statistics Service according to which in 2018 individuals of ≥ 40 years of age made 66.7% of adult population, and individuals ≥ 20 years of age made 33.3% [4].

It was found out in the study that 531 (65.6%) of 809 examined adult individuals showed a positive *anti-H. pylori* IgG test. The obtained information evidenced a high contagion of population of the Ryazan region with *H. pylori* and agrees with the existing data for other regions of RF with the prevalence of helicobacteriosis 61-90% [5-7].

The analysis of the results of a 2-year examination of the population of the Ryazan region showed that in 2017 the prevalence of helicobacteriosis among adults was 64.4%, and in 2018 – 70.2%. However, the observed increase in the amount of infected individuals was not statistically reliable ($p > 0.05$).

The prevalence of helicobacteriosis in adults under 40 years was 54.5% that was reliably lower than in the examined population of older age – 67.2% ($p < 0.05$).

Of 24 examined children and teenagers of the Ryazan region, 5 (20.8%) exhibited a positive test for IgG antibodies to *H. pylori*, all infected individuals were above 9 years of age. The prevalence of *H. pylori* infection among teenagers of 14-16 years old was 33.3%. The literature data about contagion of teenagers in other regions vary from 33-45 to 94.0% [5,8,9]. Thus, the rate of infection with *H. pylori* increases with the age of the population, however, this requires active prophylactic measures among children also, beginning from preschool and school age.

As to gender-related parameters of the prevalence of infection with *H. pylori*, it was found in 70.6% of males and 64.4% of females. Here, no reliable difference was revealed between contamination in males and females ($p > 0.05$).

In individuals above 40 the incidence rate of helicobacteriosis was higher in males – 75.2%, and 65.5% in females ($p < 0.05$). In young males and females under 40 years the incidence of infection did not show any

reliable difference and was 54.3 and 54.5%, respectively ($p>0.05$).

In Figure 1 the gender-related and age-related differences in the incidence rate of helicobacteriosis in the examined individuals are given. In some publications there is an

indication of different incidence of helicobacteriosis in males and females in different ethnic groups which requires further correlation with epidemiology of *H. pylori*-associated diseases [10,11].

% *H. pylori* infection

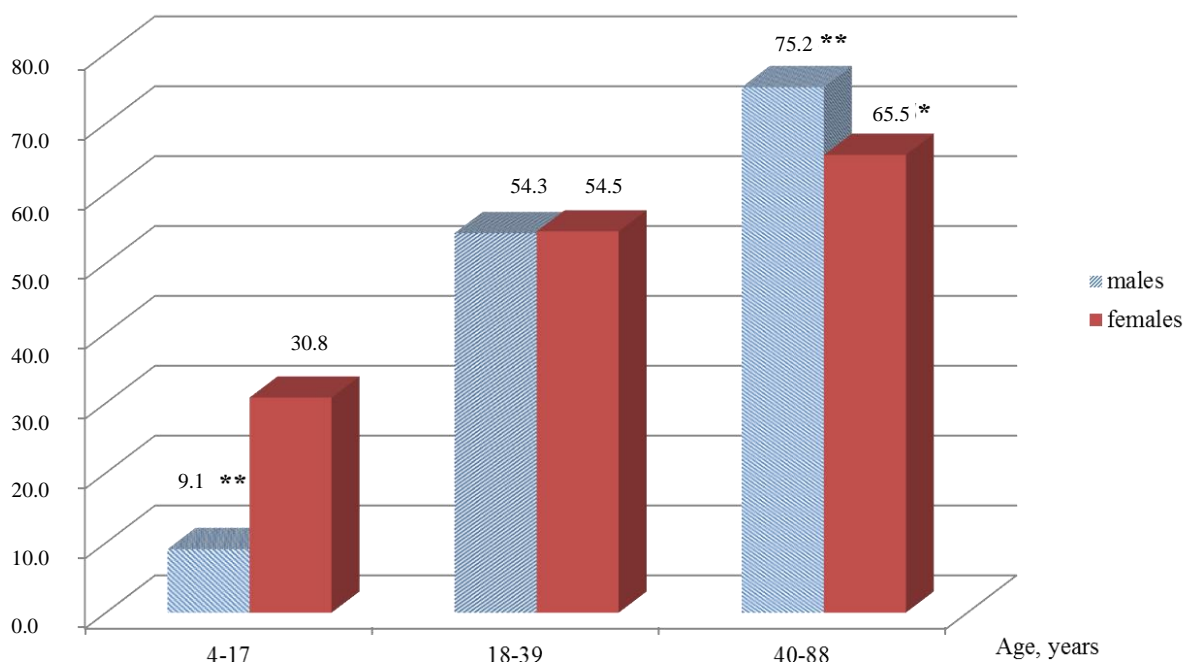


Fig. 1. Prevalence of *H. pylori* infection in males and females of the Ryazan region who passed examination in 2017-2018 (n=833)

Note: * – $p<0.5$ in comparison with males inside the age group
 ** – $p<0.05$ in comparison with males of 18-39 year group

Conclusion

Thus, prevalence of *H. pylori* infection among the adult population in the Ryazan region is high and makes 65.6% (70.6% in males and 64.4% in females). Contamination with *H. pylori* starts in childhood and adolescence reaching 20.8%, and further increases with age.

The maximal incidence rate of helicobacteriosis was found in individuals of 40 years and above – 67.2%. The ascertained differences in the rate of contamination with *H. pylori* in males and females ≥ 40 years require further study for development of measures for prophylaxis of helicobacteriosis and of the related diseases.

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Дополнительная информация [Additional Info]

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Информация об авторах [Authors Info]

*Жесткова Татьяна Васильевна – к.м.н., ассистент кафедры пропедевтики внутренних болезней ФГБОУ ВО Рязанский государственный медицинский университет им. акад. И.П. Павлова Минздрава России, Рязань, Россия. [Tatyana V. Zhestkova – MD, PhD, Assistant of the Department of Propaedeutic Internal Diseases, Ryazan State Medical University, Ryazan, Russia.]
SPIN: 7403-9954, ORCID ID: 0000-0002-6505-1031, Researcher ID: A-4929-2019. E-mail: t-zhestkova@bk.ru

Бутов Михаил Александрович – д.м.н., профессор, заведующий кафедрой пропедевтики внутренних болезней ФГБОУ ВО Рязанский государственный медицинский университет им. акад. И.П. Павлова Минздрава России, Рязань, Россия. [Mikhail A. Butov – MD, PhD, Professor, Head of the Department of Propaedeutic Internal Diseases, Ryazan State Medical University, Ryazan, Russia.]
SPIN: 7999-8925, ORCID ID: 0000-0003-3402-1128, Researcher ID: A-6144-2019.

Лымарь Юлиан Юрьевич – медицинский директор, советник клиническо-лабораторной диагностики Центра Молекулярной Диагностики ФБУН ЦНИИ Эпидемиологии Роспотребнадзора, Рязань, Россия [Yulian Yu. Lyumar – Medical Director, Advisor of Clinical and Laboratory Diagnostics at Center of Molecular Diagnostics of Central Research Institute of Epidemiology, Ryazan, Russia.]
SPIN: 6721-3370, ORCID ID: 0000-0001-9689-830X, Researcher ID: A-9647-2019.

Папков Сергей Витальевич – к.м.н., доцент кафедры пропедевтики внутренних болезней ФГБОУ ВО Рязанский государственный медицинский университет им. акад. И.П. Павлова Минздрава России, Рязань, Россия. [Sergej V. Papkov – MD, PhD, Associate Professor of the Department of Propaedeutic Internal Diseases, Ryazan State Medical University, Ryazan, Russia.]
SPIN: 3521-7226, ORCID ID: 0000-0002-1989-9939, Researcher ID: A-7645-2019.

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