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USING ELISA TO DETECT BLOOD PEPSINOGEN LEVELS

Yusupova Nargiza Abdikodirovna, Ph.D
Ass., Samarkand state medical university

Djangirov Sirojiddin Abdulakum ogli
Clinical resident, Samarkand state medical university

Abstract: Morphological assessment of the gastric mucosa is extremely labor-intensive due to the need for endoscopy, biopsy, and histological examination. In addition, even several biopsies do not provide a clear picture due to the focal, uneven nature of gastritis. In recent decades, determination of the serum concentration of pepsinogens I and II has been used for non-invasive assessment of the state of the gastric mucosa.

Key words: enzyme immunoassay, pepsinogen 1, pepsinogen 2, blood serum, stomach, ELISA.

Gastric cancer (GC) is one of the most common malignant neoplasms. Despite the long-term systematic reduction in GC incidence and mortality, about 50,000 new cases of the disease are registered in Russia annually, which creates a complex medical and social problem [1]. In terms of GC incidence in the world, Russia, like other Eastern European countries, ranks 3rd after Japan and China [2]. In Russia, GC in both men and women is in 2nd or 3rd place among all malignant neoplasms. At the same time, unlike Japan, in Russia almost half of newly diagnosed GC cases (approximately 35–50% depending on the region) represent stage IV (inoperable) of this disease [1]. Chronic atrophic gastritis is considered a precursor to gastric cancer [3]. As detailed studies by P. Correa, the development of intestinal gastric cancer regularly proceeds through a series of successive discrete morphological stages: superficial gastritis, atrophic gastritis, small intestinal metaplasia, colonic metaplasia, progressive dysplasia, and carcinoma in situ, ending with invasive cancer. This process usually covers a period of 20–30 years [4]. It has been established that in individuals with atrophic gastritis of the body of the stomach, the risk of developing gastric cancer is increased by 3–5 times compared to individuals with a normal, healthy stomach (normal mucosa — no inflammation, no atrophy, no Helicobacter pylori). In the case of severe atrophic gastritis limited to the antral section, the incidence of gastric cancer is 18 times higher than in healthy individuals. If atrophic changes are present both in the antrum and in the body of the stomach (pangastritis or multifocal atrophic gastritis), the risk increases by approximately 90 times [3]. An equally important problem is erosive and ulcerative lesions of the gastroduodenal mucosa (most often associated with H. pylori infection and/or taking non-steroidal anti-inflammatory drugs and occurring against the background of increased secretion of hydrochloric acid), often complicated by bleeding. Morphological assessment of the gastric mucosa is extremely labor-intensive due to the need for endoscopy, biopsy and histological examination. In addition, even several biopsies do not provide a clear picture due to the focal, uneven nature of gastritis. In recent decades, determination of the concentration of pepsinogens I and II in the blood serum has been used for non-invasive assessment of the condition of the gastric mucosa. Pepsinogen I (PGI) is produced in the chief cells of the gastric body mucosa; its concentration in the blood may be elevated in peptic ulcer

disease and some gastropathies, but decreases proportionally to the degree of gastric body atrophy. Pepsinogen II is synthesized by the chief and neck cells of the gastric mucosa, the pyloric glands of the antrum of the stomach, and the Brunner's glands of the proximal duodenum. The ratio of PGI and PGII concentrations in the serum or plasma of healthy individuals is approximately 4:1 (range from 3:1 to 20:1). The PGI/PGII proportion decreases linearly with increasing severity of atrophic gastritis in the gastric body. This ratio is less than 2.5–3 in severe atrophic gastritis of the gastric body (severe or moderate). Therefore, determining the level of PGI provides information on the state of the glands of the body and fundus of the stomach, PGI II - all parts of the stomach, and the PGI/PGII index is an additional criterion for atrophy of the body of the stomach. In recent years, several prospective studies have found a higher risk of gastric cancer in individuals with low PGI levels. Almost 10,000 Japanese residents were included in a cohort study [5]. The average follow-up was 4.7 years, and the average number of endoscopies was 5.1. Among the individuals examined, the risk of developing gastric cancer was 6.0–8.2 in the low PGI groups. In another study, more than 5,000 middle-aged Japanese men were followed for 10 years. The risk of developing gastric cancer increased in the presence of H. pylori antibodies (by 3.5 times), with a low PGI level of less than 30 ng/mL (by 3.5 times), or a decrease in the PGI I/II ratio < 3.0 (by 4.3 times) [6]. However, there are methodological problems in defining a “low” PGI level. Thus, in a Japanese study, when comparing diagnostic kits traditionally used in Japan and Europe, it turned out that the PGI level was twice as high when using the European diagnosticum [7]. The authors believe that a thorough analysis of the specificity and sensitivity of ELISA kits in different ethnogeographic populations is necessary. In addition to low PGI values, indicating the presence of atrophic gastritis, and, consequently, an increased risk of gastric cancer, high PGI levels indicate hypersecretion of hydrochloric acid and pepsin into the lumen of the stomach, which is manifested by a high incidence of peptic ulcer disease and gastroesophageal reflux [8]. Thus, the need to determine the level of pepsinogens in clinical practice is very high, including in individuals with low income (teenagers, young people, pensioners).

The need to develop and verify more affordable domestic diagnostic kits seems extremely important, taking into account: 1. high morbidity and mortality from gastric cancer. 2. high incidence of bleeding associated with aspirin and NSAIDs; 4. high cost of imported diagnostic kits. Vector-Best CJSC in Uzbekistan licensed reagent kits for determining the concentration of PGI and PGI. Among the advantages of these diagnostic kits, one can note a convenient setup scheme, quick results, and an attractive price compared to imported analogues. In addition, the kit includes liquid calibration samples that do not require additional dilution, and there is no need for preliminary dilution of serums, since the reaction occurs in one stage. Thus, the setup time is reduced by about 2 times compared to similar diagnostic kits, and the need for consumables is reduced.

Conclusion. Thus, the conducted studies show that domestic test systems for determining the concentration of pepsinogens I and II are not inferior to the standard accepted in the world. Moreover, taking into account adequate quality and significantly lower price (approximately 3-4 times), it is necessary to introduce the achievements of new technologies into the practice of medical institutions. This approach will allow identifying a significant portion of precancerous conditions among the population for their further thorough examination.

Bibliography

1. Белковец А.В. и соав. Опыт неинвазивной диагностики атрофического гастрита в текущей клинической практике. //Бюллетень со рамн, том 33, № 4, 2013. С.71-76.
2. Белковец А.В. и соав. Неинвазивная диагностика фенотипа гастрита в клинической практике: анализ первой тысячи исследований. //Экспериментальная и клиническая гастроэнтерология // выпуск 115 № 3 2015. С.26-30.

3. Зайцева А.А., Богданова Т.М. «Онкологические аспекты органов желудочно-кишечного тракта» ФГБОУ ВО «Саратовский государственный медицинский университет имени В. И. Разумовского Минздрава России, [Электронный ресурс] –URL: bogtanmih@mail.ru
4. Джураев М.Д., Худайбердиева М.Ш. Роль серологического опухоль-ассоциированного маркера СА-72-4 при ранней диагностике рецидива рака желудка. //Сибирский онкологический журнал. 2009. Приложение № 2. С. 63.
5. Решетников О. В., Курилович С. А., Рагино Ю. И., Молчанова А. Р., Сорокина Н. Н., Кротов С. А., Кротова В. А. Использование иммуноферментного анализа для выявления уровня пепсиногенов в крови. //Гастроэнтерология экспериментальная и клиническая №5/2013, С. 26-30.
6. Решетников О.В. и соав. Физиологическое и клиническое значение пепсиногенов желудка. // Клиническая медицина. № 3, 2014. С. 26-30.
7. Юсупова Н.А.Негмаджонов Б.Б.Бердиярова Ш.Ш. Роль сбалансированной микрофлоры в поддержании гомеостаза влагалища// Достежения науки и образования - № 14. 2020, С. 74-77.
8. Душанова Г.А., Набиева Ф.С., Садинова М.Ж., Нурматова Д.М. Анализ взаимосвязей параметров иммунного гомеостаза с сосотоянием системы ПОЛ-АОС// Вестник науки и образования. № (105) часть 2- 2021, С.63-69
9. Ибрагимова, Н.С. Ибрагимова. Роль гомоцистеина в патогенезе синдрома поликичтозных яичников у женщин Б.Ф. //international scientific review. Вып. 3, -2020, .3
10. Rizaev J.A. Influence of fluoride affected drinking water to occurrence of dental diseases among the population // Eurasian Journal of BioMedicine, Japan, Vol. 4, Issue 5, P.1-5 19.
11. Rizaev J.A., Khazratov A.I. Carcinogenic effect of 1,2 - dimethylhydrazine on organism as a whole // Problems of biology and medicine, 2020. № 1. Vol. 116. C. 269. 20.
12. Rizaev J.A., Khazratov A.I., Lisnichuk N.E., Olimjonov K.J., Reimnazarova G.J. Pathomorphological changes in the oral mucosa in patients with colon cancer// European Journal of Molecular & Clinical Medicine, vol.7, Issue 7, P.666-672. 21.