
CONTENT OF ANTIOXIDANT VITAMINS IN THE BLOOD OF PATIENTS WITH CHRONIC GASTRITIS

Efremova A.V., Mironova G.E., Sosina S.S.,

Konstantinova L.I.

Yakut Scientific Center of complex medical problems Siberian branch of the Russian Academy of
Medical Sciences

North-Eastern Federal University named after M.K. Ammosov

Summary

The study examined the content of antioxidant vitamins A, E and C in the blood of patients and availability of vitamins in daily diet of these patients, depending on the degree of contamination *H. pylori* in the gastric mucosa. The study included only indigenous persons suffering from chronic gastritis, aged 30 to 50 years.

Keywords: chronic gastritis, *H. pylori*, antioxidant vitamins

Conclusion: Increasing the degree of contamination of the gastric mucosa *H. pylori* in patients with chronic gastritis leading to the development polyhypovitaminosis.

Introduction

The antioxidant defenses of the body indigenous population of Yakutia is low in vitamins and low molecular weight antioxidants perhaps because of the effects on the body of Aboriginal extreme climatic conditions of the North [2, 3, 4, 10, 12, 14]. Inadequate supply of human organism with vitamins, which are among the essential nutrients can cause failure of various organs and systems with the subsequent development of pre-disease state, and then the disease.

Materials and methods

The study involved 160 patients with chronic gastritis (CG), aged 30 to 50 years (mean age $44,56 \pm 2,46$ years). Based on the morphological and ELISA were divided into two groups. The first group 115 patients with chronic gastritis associated with *H.pylori*, the second group - 46 patients with chronic gastritis, unassociated with *H.pylori*.

Patients with chronic gastritis associated with *H.pylori*, were divided into three groups. The first group comprised 26 patients with chronic hepatitis, in which the morphological biopsy specimens

were found up to 20 microbial cells in the field of view [1]. The second group included 18 individuals with moderate severity of *H. pylori* (20 to 50 microbial cells in morphology biopsy). The third group consisted of 43 patients with advanced degree (more than 50 microbes). The control group consists of 71 people, apparently healthy respect pathology of the gastrointestinal tract. The criterion for the absence of *H. pylori* was the coincidence of the negative results of serological and morphological studies.

Supply of vitamins was analyzed on the basis of concentrations of α -tocopherol (vitamin E), retinol (vitamin A), which were evaluated using the analyzer bioliquids "Fluorat-02-ABLF-T" (Lumex, St. Petersburg). The content in the blood of ascorbic acid (vitamin C) was determined by titrimetry [7]. The intensity of free radical oxidation of lipids was evaluated spectrophotometrically by accumulation in the blood serum of products which react with thiobarbituric acid (TBA-RP) [11].

The actual nutrition surveyed was analyzed by daily food recall [9] to obtain information on measures taken in the previous day's food by interviewing with album meals and dishes [8]. Based on the data from the tables, "The chemical composition of Russian food" was determined the chemical composition of the daily diet [13]. The balance of the diet was estimated by the consumption of essential nutrients, energy, and comparing them with those in Guidelines «Nutrition. Norms of physiological needs for nutrients and energy for different groups of the population of the Russian Federation" (MI 2.3.1. 2432-08) [15].

When performing statistical analysis tested for normal distribution of the studied quantitative test was performed by the Kolmogorov - Smirnov. The significance of differences between mean values was assessed using Student's t test for independent samples, the probability of the null hypothesis is accepted at $p < 0,05$. Correlation analysis was performed by the method of Pearson. Data in the tables are presented as $M \pm m$, where M - mean, m - error of the mean.

Results and discussion

According to our studies the level of vitamin C in the blood of patients with chronic gastritis associated with *H. pylori*, was 1.3 times the blood uninfected patients - 1.2 times less than in the control group. Reducing the concentration of ascorbic acid in the blood of patients with chronic gastritis associated with *H. pylori*, indicating they have hypovitaminosis C, possibly caused by infection with *H. pylori*.

The data show that the higher the degree of contamination *H. pylori* in the coolant, the more pronounced deficiency of vitamin C in the blood serum of patients with chronic hepatitis. Thus, patients with a low degree of contamination *H. pylori* levels of vitamin C in blood serum was reduced by 22% ($p < 0.05$), with a moderate degree of contamination *H. pylori* - by 17%, with a pronounced degree of contamination *H. pylori* - by 30% compared to controls ($p < 0.05$) (Fig. 1). It

should be noted that even in apparently healthy individuals in the control group, the availability of ascorbic acid does not meet generally accepted standards. Our data are consistent with the references [5, 6, 16].

In this paper Khomeriki S.G. (2001) researchers showed that the level of vitamin C in the body of patients dramatically reduced as the development of gastritis associated with *H. pylori*. The study Green I.I. (2006) revealed the dependence of ascorbic acid in gastric juice of patients with chronic gastritis of the degree of contamination of *H. pylori*. Thus, the concentration of vitamin C in gastric juice was significantly lower in the severe degree of contamination *H. pylori* in the gastric mucosa than mild to moderate.

Mean concentration of vitamin A in patients with chronic gastritis, unassociated with *H. pylori* ($0,04 \pm 0,001$ mg/100 ml) did not differ from the average persons with HP-associated gastritis in which the level of vitamin A ($0,038 \pm 0,001$ mg/100 ml) was reduced by 1.3 times ($p < 0,05$) relative to the value of the control group (Fig. 2).

Analysis of vitamin A in patients with chronic gastritis, depending on the degree of contamination *H. pylori* showed that the first and the second group of patients (with slight to moderate contamination *H. pylori* respectively) levels of vitamin A was 1.2 times, and the third (from severe degree of contamination *H. pylori*) - 1.6 times ($p < 0,05$) lower than the control group (Table 1).

The concentration of fat-soluble vitamin E in the blood serum of the control group was $0,12 \pm 0,002$ mg/100 ml (Fig. 3). In patients with chronic gastritis, is not associated with *H. pylori*, it was lower by 1.1 times and amounted to $0,11 \pm 0,003$ mg/100 ml. The content of vitamin E in the blood of infected patients was equal to $0,10 \pm 0,002$ mg/100 ml, which is below the value of the control factor of 1.2.

In the blood of patients in the first group and a second concentration of the fat-soluble vitamin E did not differ from the control group. The third group also showed a significant decrease ($p < 0,05$) levels of vitamin E is 1.4 times as compared with control, indicating that the formation of excessive ROS leading to consumption of antioxidants including lipophilic α -tocopherol (Table 1).

A significant reduction of fat-soluble antioxidant vitamin in patients with severe contamination, possibly due to the long-term persistence of *H. pylori* in the gastric mucosa of patients.

The results obtained are consistent with the literature. The study P.S. Phull et al (1996) found that the vitamin E content in the stomach is significantly lower than in the antrum, which indirectly reflects the mobilization of antioxidant protection of the patient in the most inflamed stomach sections [17]. In Y.Q. Sun et al (2005) conducted by the Mongolian gerbil, it was found that the protective effect of vitamins C and E was observed only in the early stages of infection with *H. pylori*, and with long-term persistence *H. pylori* effect decreases [18].



The analysis of our results on the content in the blood of a water-soluble vitamin C and fat-soluble A and E showed that the greatest deficiency of antioxidant vitamins experienced patients with severe degree of contamination of *H.pylori*. Probably, this fact is due to increased utilization of exogenous low molecular weight antioxidants. As with the increase in the degree of contamination *H. pylori* in the gastric mucosa of patients revealed a significant increase in the content of lipid peroxidation products. Thus, the level of TBA-RP in the blood of patients with a low degree of contamination *H. pylori* was 1.6-fold ($p < 0.05$) in patients with moderate contamination - to 2.0-fold ($p < 0.05$) and in the blood of patients with severe degree of contamination - 2.4 times ($p < 0.05$) higher than the average in the control group. Another possible reason for the decrease in blood of patients with chronic gastritis with a pronounced degree of contamination *H. pylori* in the gastric mucosa of exogenous antioxidants vitamin A, E and C is reduced acidity in the stomach mucosa. Continuously flowing *H. pylori*-infection leading to atrophy of the gastric glands and the processes of intestinal metaplasia, accompanied by an increase in intragastric pH. Under these conditions endogenous antioxidants unable to exercise their protective effects, this leads to an increase in gastric mucosa fixed concentration of active oxygen species. Deficiency of antioxidant vitamins increases the risk of inflammation and immune deficiency, the molecular mechanisms at the basis of which is increased synthesis of reactive oxygen and nitrogen.

It is well known that vitamins are important enzymes in the structure providing the metabolic processes of the body. Much of the vitamins are not synthesized in the human body and its supply is determined by their content in food. Therefore, we studied the essential vitamins intake in the daily diet (Table 2).

Analysis of the vitamin content of the daily diet of patients with chronic hepatitis showed that the failure is combined. Revealed an extremely limited intake of carotenoids from food - 61% below the recommended values in both groups. Marked by an acute shortage of vitamin C intake, as in the group of men and women in the group. Thus, dietary intake of vitamin C among men was 60% lower than the recommended rate, and women - by 69%.

It should be noted that low levels of vitamins in the daily diet of the surveyed rural population due to the extremely limited consumption of fresh vegetables, fruits and berries. It is known that patients with diseases of the gastrointestinal tract of low supply of vitamins can be caused by malabsorption of vitamins and sharing, poor appetite, the purpose of the reduced light diet. We have identified a profound deficiency of vitamins C and A in the blood serum of patients with chronic gastritis with a pronounced degree of contamination *H. pylori* is due not only to lack of content in the diet, but also due to increased free radical processes in the body of patients infected with *H. pylori*.

Conclusion

Increasing the degree of contamination of the gastric mucosa *H. pylori* in patients with chronic gastritis leading to the development polyhypovitaminosis: patients with mild and severe contamination *H. pylori* antioxidant content of vitamin C in blood serum decreased by 22 and 30%, respectively, when the concentration of fat-soluble antioxidant vitamins A and E in patients with a low degree of contamination *H. pylori* does not differ from the values of indicators of healthy persons, patients with severe degree of contamination *H. pylori* significantly reduced by 40 and 58%, respectively.

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