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Overcoming the Imbalance of Intestinal Flora as a Method of Preventing the Development of Diseases of Various Genesis

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ABSTRACT

The purpose of this work is to consider the features of overcoming the imbalance of the intestinal flora as a method of preventing the development of diseases of various genesis. The author points out that the intestinal flora is an important part of the human body and plays an irreplaceable role in homeostasis and pathological processes of the human body.

It is widely recognized that the imbalance of intestinal flora affects the occurrence and progression of diseases.

Natural compounds are now used by specialists in the treatment of diabetes, including strengthening the barrier of the intestinal mucosa by regulating the microbial composition of the intestine, the production of microbial SCFA and the suppression of inflammation associated with LPS. Thus, the constant optimization of the extraction processes of chemically pure active compounds from natural herbal preparations is crucial.

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INTRODUCTION

The collection of microorganisms present in the intestines of the body is called the gut microbiome. It participates in the regulation of the physiological functions of the host's digestion, immune regulation and the development of the nervous system. There are more than 3.3 million genomes of intestinal microbes in the body, which are very dynamic and evolutionary.[1] The researchers pointed out that in the recent period there have been many studies that indicate that the human intestinal flora can directly affect various negative changes in the body. Diseases that occur in the event of an imbalance of the intestinal microflora have a different nature, can be both neurological and, for example, cardiovascular. In addition, individual microorganisms living in the intestine can cause cancer. At the same time, the latter type of pathology often occurs on the basis of local inflammatory processes.[2]

The metabolism of various genes causes the development of a number of intestinal bacteria. These mechanisms directly affect the breakdown of carbohydrates, while living organisms cannot always organize the necessary process of assimilation of polysaccharides.

As a result, it is often possible to develop diabetes. At the same time, the intestinal microflora can organize barrier support of the body, reducing the negative effects of various extraneous factors. It is the intestinal bacteria that determines the level of intestinal permeability, the metabolism that occurs in it, as well as the production of compounds such as short-chain fatty acids (SCFAs), amino acid derivatives and secondary bile acids (SBAs).[3]

A decrease in the level of SCFA can destroy the metabolic homeostasis of the host; a violation of the metabolism of BA can affect the expression of BA receptors in the intestine and then disrupt the corresponding pathways of glucose metabolism.[5] In addition, innate immunity also plays a role in the interaction between the intestinal flora and diabetes mellitus, which once again confirms that the intestinal flora is closely related to the onset of diabetes. The purpose of this work is to consider the features of overcoming the imbalance of intestinal flora as a method of preventing the development of diseases of various genesis.

KEYWORDS:
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MATERIALS AND METHODS

In the process of writing the work, an array of literature was analyzed within the framework of the research topic, and comparative and analytical research methods were also used to generalize and analyze the material.

Experts point out that the composition of the intestinal flora includes certain types of anaerobic bacteria, including Firmicutes (Lactobacillus, Enterococcus and Clostridium), Bacteroidetes, Proteobacteria (Enterobacteria), Actinobacteria (Bifidobacterium), Fusobacteria and Verrucomicrobia.[5]

At the same time, in patients with type 2 diabetes mellitus, the number and volume of the above-mentioned bacteria have different ratios. Certain types of bacteria are highly discriminant for patients with the above ailment.

The composition of SCFAs includes various acids directly involved in lipogenesis and gluconeogenesis. In the human intestine, SCFAs are involved in the fermentation of carbohydrates. These processes directly affect the translation of carbohydrates.

Various studies indicate that the volume of bacteria that are responsible for the formation of SCFAs in diabetic patients is significantly reduced. This process can negatively affect the health of such patients, increasing the development of both the disease itself and, in general, weakening the protective functions of the body.[6]

By means of bile acids, glucose homeostasis is controlled, after which an environment is formed in the intestine that ensures the processing of food lipids. Against the background of this process, the growth of a number of beneficial bacteria increases.[7]

The intestinal barrier consists of the intestinal epithelial barrier, the intestinal mucosal barrier and the intestinal vascular barrier. When the integrity of the intestinal barrier is violated, severe systemic inflammation and metabolic diseases occur.[8]

Microorganisms that are in the intestine play a significant role in the process of protecting the human body from the development of cancer. The number of microorganisms living in the intestine is quite large.

In the last period, oncology specialists who have studied the mechanisms of the occurrence of various carcinogenic diseases have come to the conclusion that their development is caused precisely by the imbalance of certain microorganisms. At a certain time, unique compositions that are created against the background of microflora can cause the development of a particular type of cancer.

The occurrence of a particular type of tumor can cause the reproduction of various types of microorganisms, especially if they are anaerobic in nature.[9]

A separate type of research that has studied the occurrence of intestinal cancer confirms the following fact: if the intestinal microenvironment is in a state of imbalance, then colorectal cancer inevitably develops.

In support of their words, the researchers cited data that the proportion of certain microorganisms in the intestines of patients who were diagnosed with such a diagnosis differs significantly from those who had benign neoplasms in the intestine.

In general, if the intestinal microbiota undergoes changes associated with a violation of the regulation of the formation or vital activity of certain microbes, then we can say that there is a carcinogenic factor that negatively affects the body. If inflammatory conditions of the body occur, then abnormal activation of cellular signaling pathways occurs, resulting in a sharp progression of the disease.[10]

Studies have shown that Clostridium difficile is directly responsible for the development of intestinal tumors; Clostridium Difficile is present in increased proportions in 10-15% of patients, which is closely associated with disease progression, increased risk of recurrence and shorter patient survival.[11]

With the participation of various microorganisms in the intestine, a number of inflammatory processes can develop, as well as changes in various physiologies of a number of cells that form the epithelium and regulate inflammatory signals. These cells are directly involved in the activation or reduction of the immune response.

Colonies of microorganisms can also take part in the production of a number of metabolites that enter the body through translocation. In particular, a violation of the secretion of gastric juice can occur due to the bacterium Helicobacter pylori, which initiates the colonization of a number of bacteria in the stomach environment, resulting in the occurrence of oncology in many cases.

For example, there are studies that indicate an increase in the bacteria responsible for the production of lactic acid in the body of these patients who were diagnosed with stomach cance.[12]

The reason for the increase in the volume of such bacteria is due to the fact that lactic acid is responsible for the formation and growth of the tumor, respectively, the increase in the volume of such acid may directly indicate that tumor cells divide quite intensively.[13] In addition, studies have shown that nitrospires are found in almost all patients with stomach cancer, but not in patients with chronic gastritis.[14]

Accordingly, it can be concluded that there are trillions of different bacteria in the human body today, which enter into various relationships with each other, regulate a number of processes, both pathological and positive.

At the same time, these processes directly affect the human immune system, and a failure in this system can negatively affect the immune response of the body. Due to a decrease in the level of the immune response, the progression of oncological diseases, which have various development factors, is possible.

Accordingly, the regulation of the intestinal microflora today can be considered one of the main tasks of medical specialists, since it is the ratios of different types and kinds of bacteria that, as we believe, is the main aspect of maintaining the balance of a healthy organism.

For this reason, many researchers are conducting various research in the search for a number of treatment methods

or the development of medicines that positively affect the balance of intestinal microflora.

These studies are related both to the general traditional approach and to aspects of national medical research, which is currently conducted by specialists from all over the world. It is necessary to carefully study various options for organizing the microflora balance process in order to create optimal synthesis of these approaches and achieve the most positive results in this direction.

DISCUSSION

Natural medicines are quite often used in the treatment of chronic diseases, since it is these medicines that have the least number of side effects and often do not have a negative effect on the human body. In modern conditions, patients suffering from diabetes can, in addition to traditional medicinal accompaniment, receive various medicines of natural origin.

This group of drugs refers to an auxiliary type of treatment, while the mechanisms targeted by these drugs include oxidative stress, endoplasmic reticulum stress, as well as metabolic and inflammatory reactions in the host.

A number of studies related to the treatment of diabetes through the use of natural medicines were aimed at improving the state of the intestinal microbiota of patients. As we have already indicated above, the state of the intestinal flora directly affects various processes of the host organism, in particular, the digestive process, metabolism, and vitamin absorption are much better if the intestinal microflora and its processes are balanced.

It is also very important to point out that the pathways of diabetes mellitus are also directly related to the state of the intestinal flora, since they are responsible for glucose homeostasis, the process of insulin signaling, as well as the occurrence of various inflammatory processes. Experts note the rather high role of various natural compounds that have a direct impact on the intestinal microbiota and have a positive effect on the human body.

Experts note a fairly high role of green tea in this process. Epigallocatechin-3-gallate (EGCG) is the main catechin of green tea. Thus, according to a number of authors, EGCG not only improved the parameters of mice with diabetes, but also significantly increased the ratio of Firmicutes/Bacteroidetes at the type level and increased the relative abundance of Lactobacillus at the genus level.[15]

Also, among the drugs that positively affect the work of the intestinal microflora in the microflora, the authors call curcumin. This natural component eliminates the imbalance of intestinal microorganisms, has a positive effect on the health of patients. Another group of researchers suggests paying attention to quercetin, which is found in vegetables or fruits, and has an effect on reducing oxidative stress in hosts. It has a positive effect on the microbial flora of the intestine, regulates the state of health of patients with diabetes mellitus.

Also, among other biological compounds are called rhine, bitacyanin, capsaicin. These natural compounds are found in chili peppers, pitaya fruits and other plant products, which are widely available and contribute to the stabilization of the health of patients with diabetes mellitus .[16]

Probiotics also play a great role in restoring the intestinal microbiota. The term “probiotics” refers to specific bacteria or a combination of live bacteria, and studies have shown that adequate intake of probiotics can improve the body’s immune environment and help prevent disease.

The use of probiotics for the treatment of tumors has been studied in several clinical trials, but most of them were aimed at analyzing changes in the microbial population, rather than the effects of microbes on tumors. A clinical study showed that patients with colorectal cancer who took probiotics had significant changes in the intestinal microbiota, mucosa, and stool analyses showed a significant increase in the number of microorganisms producing butyrate.[17]

It should also be said about the need to follow a diet, which greatly affects the development of the intestinal microbiota. A balanced diet is the main factor that stabilizes the work of the whole body. The consumption of various foods can cause both positive and negative reactions of the body, and the task of a specialist is to organize such a diet for patients so that it can be useful in the treatment and prevention of various diseases.

In particular, eating a large amount of fatty food, food that is difficult to digest, can negatively affect the colonies of bacteria contained in the intestine, thereby reducing the immune defense of the body.

Conversely, the use of lactic acid products, products of plant origin, especially rich in various vitamins and minerals, will contribute to the fact that colonies of microorganisms will multiply, thereby strengthening the immune response of the body.

If earlier the diet was put on the back burner and represented accompanying measures in the process of organizing the treatment of patients, today specialists are paying more and more attention to the therapeutic nature of nutrition, since it is he, first of all, and not medicinal drugs, that contribute to the fact that a person is recovering, his body is coming back to normal, and in combination with medications, doctors can achieve much more positive results than if the diet was excluded from their attention.

It is for this reason that today there is a development of various complexes of diets, which include useful products necessary for the human body suffering from a particular disease, in particular, diabetes mellitus.

The emphasis on the proper organization of nutrition today, in our opinion, has a very high value, as it allows you to achieve much better results than just when conducting drug therapy. For this reason, it is necessary, today, to pay attention to the natural and dietary component in the treatment of patients suffering from various internal diseases, in particular, diabetes mellitus. This way, in our opinion, will be the most productive and expedient.

CONCLUSION

The intestinal microflora of the human body plays a very important role in the health of patients. The immune response, first of all, is necessarily a consequence of the balance of certain colonies of microbes that inhabit the intestine.

If there is an imbalance of microorganisms, then diseases such as cardiovascular, oncological, and diabetes mellitus can develop, the insulin response in which largely depends on the balance of individual microbes in the intestine.

Today, experts focus not only on medicines used in the treatment of diabetes mellitus, but also on various natural compounds that have a positive effect on the human body. These products strengthen the intestinal mucosa, reduce the levels of various inflammatory reactions, and also contribute to the development of beneficial intestinal microflora, which organizes the protection of the human body from various diseases.

In addition, the diet, which is designed specifically to balance the work and development of microorganisms, is also very important in the treatment of patients with various diseases in general and diabetes mellitus in particular. It is for this reason that specialists need to pay close attention to the dietary component of the treatment process, which will contribute to the improvement of the nation in the future.

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