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POSSIBILITY OF ACUTE INTESTINAL FOOD-BORNE INFECTIONS HOLIATRY: APPROACH WITH COMBINED PRE- AND PROBIOTIC

Summary. The article deals with the study of the efficiency of using contemporary combined prebiotic and probiotic as the component of the holiatry in patients with acute intestinal infection. Clinical and microbiological efficiency of combined pre- and probiotic is well-proven as a bacterial preparation, that could corrects the abnormal intestine microbiocenosis from the first days of acute intestinal disease, caused by salmonella, shigella, citrobacter, proteus, pathogenic staphylococcus. Combined pre- and probiotic can be recommended in the holiatry for patients of different age and sex in case of acute diarrhea syndrome of probably infectious origin.

Key words: acute intestinal infections, treatment, combined pre- and probiotic.

Introduction

Morbidity of acute intestinal disease continues to be maintained at the leading position «rating» of infectious diseases, yielding only acute respiratory disease [1]. From the epidemiological point of view, the situation is steadily worsening in developing countries, tropical areas and regions with low sanitary culture where there is a lack of drinking water, food quality, etc. [2]. According to the WHO terminology, acute intestinal infections — it diarrheal diseases, bringing together more than 30 nosology of bacterial, viral or protozoan etiology, leading symptom of which is acute diarrhea [3]. These infectious conditions threaten the health and lives of infected people because of the possibility of dehydration, hypovolemia, generalization of infection outside the intestine, infectious-toxic shock. According to the World Gastroenterology Organization, every year the world record at 1.5 billion episodes of acute diarrhea presumably infectious origin which is a problem for every country in the world, while the incidence of a steady upward trend [4]. The incidence of acute intestinal diseases in Ukraine has a high proportion among 12–15 millions of registered infectious diseases [5]. Risk of disease on the territory of the European Union and Ukraine is growing in the summer-autumn season.

In the long course of evolution it has been formed the complex relationship between man and his surrounding microorganisms. Today found about 700 different species of microorganisms that inhabit the human body. Actually microflora is seen as an important metabolic and regulatory component, which together with various organs and tissues involved in retained homeostasis [6].

The problem of acute intestinal infections and the possibility of their drug correction inextricably linked to the intestinal microbiota, microflora which is the primary target of exogenous factors flora and its aggression. Development is well known in most patients with the syndrome of

acute diarrhea in the first days of quality changes and/or quantitative composition of the gut microbiota. It shows the development of metabolic and immune disorders are possible manifestation of clinical symptoms of amplification digestive disorders, violation of water-electrolyte metabolism, occurrence enteral syndrome (diarrhea, bloating, rumbling), often the dysfunction of the colon, impaired synthesis and absorption of essential vitamins, metabolism of development likely prolonged duration of infection in the digestive tract [7].

There are two main reasons that actualize empowerment intestinal microflora correction against the background of acute infectious diseases: the diversity of pathogens associated with diseases of the gastrointestinal tract (enterohemorrhagic *E.coli*, that produce the toxin *Shiga*, *Salmonella*, *Shigella*, *Cyclospora*, *Cryptosporidium*, *Giardia*, *Campylobacter jejuni*, *Clostridium*, *Saliciviruses*, enteroviruses), more than 200 million cases of diarrheal disease annually (USA) [8]. Most of these microorganisms is easily transmitted through food or water or from one person to another. The second reason is the rapid spread of pathogens globalization and industrialization, due to the complexity of detecting pathogens, so the total change strategy correction and elimination of intestinal pathogens near optimal rehydration [9].

Currently, the «gold standard» in the treatment and prevention of disorders microbiota is the use of drugs that regulate the normal intestinal microflora — probiotics.

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Widely used in correction dysbiotic changes to take drugs based on bifidobacteria and lactobacilli (biolact, lactobacterin, Linex, bifidumbacterin etc.), and combined treatment Symbiter, Bifi-forms, bificol, Biosporin, sporobacterin, Enterol-250, etc. [10]. Given the globalization of the world market notable is the appearance of new combined prebiotic and probiotic (AAP manufacturing Pharma, the Republic of India).

The purpose of the research — to study the efficacy of new combined prebiotic and probiotic usage in treatment of patients with acute intestinal disease.

Material and methods

A prospective clinical microbiological research design «case-control» was conducted in 2014 on the basis of department of infectious diseases at Chernivtsi regional clinical hospital (Northern Bukovina, a region in Western Ukraine) with 37 patients with acute intestinal infection. For etiological structure of all involved in the study cases distributed as follows: salmonellosis (*Salmonella enteritidis*) — 7 cases; Food poisoning caused by opportunistic microorganisms (*Citrobacter*, *Proteus*, *Staphylococcus aureus*, *S. pyogenes*) — 16; shigellosis — 2 patients. The age of the patients ranged from 22 to 72 years, the gender distribution was equivalent to almost 1 : 1.

Discussion

By analyzing the clinical features of the disease in all the patients we noticed that dominated gastroenteritic version with moderate illness course: acute onset, short incubation period, short-term increase in body temperature to subfebrile digits, nausea, vomiting, pain mainly epigastric and around the umbilicus, liquid stool without pathological admixtures to 5–6 times a day. For shigellosis caused by *S. sonnei*, in two cases noted gastroenterocolitic variant. The control group involved 12 patients with the syndrome of acute diarrhea, presumably infectious origins, of similar age and gender who received standard therapy.

Studied groups were equal each other on the severity of the disease and the etiological factor.

Treatment of acute intestinal infections require correction changes of intestinal microflora using modern probiotics in combination with prebiotics. One of these drugs is new combined prebiotic and probiotic. Each capsule contains 9 strains of viable probiotic microorganisms that are part of the normal intestinal flora: *Lactobacillus acidophilus* ($7.0 \cdot 10^8$), *Lactobacillus rhamnosus* ($4.0 \cdot 10^8$), *Lactobacillus casei* ($3.0 \cdot 10^8$), *Lactobacillus plantarum* ($3.0 \cdot 10^8$), *Lactobacillus bulgaricus* ($3.0 \cdot 10^8$), *Bifidobacterium longum* ($3.0 \cdot 10^8$), *Bifidobacterium infantis* ($3.0 \cdot 10^8$), *Bifidobacterium breve* ($3.0 \cdot 10^8$), *Streptococcus thermophilus* ($4.0 \cdot 10^8$), oligosaccharide 100.0 mg. Inactive ingredients: gelatin capsule — 99.0 ± 6.0 mg. Lactobacilli and bifidobacteria secrete substances that have antibacterial properties help to reduce the acidity of the intestinal contents, inhibiting reproduction of intestinal pathogens, help digest dairy products, splitting lactose, contribute to a better absorption of calcium.

Prebiotics (oligosaccharide) carry a stimulating effect on the growth titer of own intestinal microflora. Last contains substances that are the source of energy and nutrients for intestinal microorganisms; enhance calcium absorption; reduce transit time passage of food through the gastrointestinal tract; enhance natural immunity microorganism (stimulates the production of IgA, promote cytokine modulation). The combination of probiotics with prebiotics potentially improves survival and survival of probiotics in the gut, and selectively stimulates the growth and metabolic activation of lactobacilli and bifidobacteria [11].

The features of clinical course of nutritional diseases, shigellosis, salmonellosis, depending on the etiological agent, taking into account the results of general clinical, laboratory and bacteriological analysis. According efficacy of treatment with the inclusion lactoken to the clinical course of disease and changes in microbiota of the colon. Identification of pure cultures of selected microorganisms was performed by morphological, cultural, biochemical, serological properties (antigenic structure) and the main features of pathogenicity.

In the study of changes in microbiota colon showed a reduction in the number of lactobacilli, bifidobacteria, the total number of *E.coli*. The content of lactobacilli $< 10^6$ CFU/g of feces was observed in half of the patients, and the rest mainly in patients with food poisoning, approached the norm — 10^7 CFU/g (normal $> 10^6$ CFU/g); Bifidobacterium population level was $< 10^7$ CFU/g in 8 patients, and in 15 patients approaching the normal range ($> 10^7$ CFU/g). Detected as reducing the total number of *E.coli* $< 10^6$ CFU/g in three.

All patients received basic therapy (rehydration therapy in the form of infusion administration solutions «Trysil» reosorbilact, Ringer's solution, orally (rehydron), sorbents (enterosgel), enzymes, antispasmodics, antibiotics (Nifuroxazide, norfloxacin) and thirteen patients were additionally put on new combined prebiotic and probiotic 2 capsules TID for 30 minutes before meal.

It has been found increasing leukocyte intoxication index — 2.09 ± 0.26 , shift index of white blood cells — 3.46 ± 0.32 , hematological toxicity index — 4.02 ± 0.37 at the height of illness in all patients. The integrative indices of endogenous intoxication normalized with the improvement of the general condition of patients and disappearance of intoxication. However, in 12 patients who were on standard therapy alone, above estimated indeces were slightly higher even in the period of convalescence. The latter can be explained by detoxifying function of representatives of normal microflora, which are part of new combined prebiotic and probiotic.

It has been noted that the intoxication symptoms: fever, general weakness disappeared sooner in patients who got new combined prebiotic and probiotic. Analysis of the clinical manifestations of the gastrointestinal tract revealed a more pronounced effect obtained using new combined prebiotic and probiotic that is developed faster normalization of stool, regression bloating, abdominal pain disappearance. The intoxication symptoms and faster stool normalization (an average of one day) were observed in patients receiving

new combined prebiotic and probiotic disappeared in compared to the control group.

Thus, correction of intestinal microbiota by new combined prebiotic and probiotic usage (combined prebiotic and probiotic) is possible and effective component in the composition of complex treatment of acute intestinal infections in adults, including salmonella, food poisoning caused Proteus, pathogenic staphylococcus, shigellosis.

Conclusions

1. The inclusion of combined prebiotic and probiotic to the traditional treatment for patients with food-borne infections, salmonellosis and shigellosis accelerates the regression of symptoms of intoxication and diarrheal syndrome, the reduction of the acute period of disease.

2. Administration of new combined prebiotic and probiotic to patients with acute intestinal infection is not accompanied by adverse medication reactions.

3. Control stool culture were negative after treatment of patients salmonellosis and shigellosis that means the bacteriological efficacy of probiotic onto intestinal pathogens.

4. Combined prebiotic and probiotic can be recommended as a drug with clinical and microbiological efficacy in the treatment of patients with acute intestinal infection.

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МОЖЛИВОСТІ КОМПЛЕКСНОГО ПІДХОДУ ПРИ ГОСТРИХ КИШКОВИХ ІНФЕКЦІЯХ: ВИКОРИСТАННЯ КОМБІНОВАНОГО ПРЕ- І ПРОБІОТИКА

Резюме. Стаття присвячена вивченню ефективності застосування сучасного комбінованого пре- та пробіотика в складі комплексного лікування хворих на гостру кишкову інфекцію. Доведено клінічну та мікробіологічну ефективність комбінованого пре- та пробіотика як бактеріопрепарату, що здатен коригувати порушений мікробіоценоз кишечника з перших днів гострого кишкового захворювання, викликаного сальмонеллою, шигеллою, цитробактером, протеєм, патогенним стафілококом. Комбінований пре- і пробіотик може бути рекомендований у комплексному лікуванні пацієнтів різного віку та обох статей при синдромі гострої діареї ймовірно інфекційного походження.

Ключові слова: гострі кишкові інфекції, лікування, комбінований пре- і пробіотик.

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ВОЗМОЖНОСТИ КОМПЛЕКСНОГО ПОДХОДА ПРИ ОСТРЫХ КИШЕЧНЫХ ИНФЕКЦИЯХ: ИСПОЛЬЗОВАНИЕ КОМБИНИРОВАННОГО ПРЕ- И ПРОБИОТИКА

Резюме. Статья посвящена изучению эффективности применения современного комбинированного пре- и пробиотика в составе комплексного лечения больных с острой кишечной инфекцией. Доказана клиническая и микробиологическая эффективность комбинированного пре- и пробиотика как бактериопрепарата, который способен корригировать нарушенный микробиоценоз кишечника, с первых дней острого кишечного заболевания, вызванного сальмонеллой, шигеллой, цитробактером, протеєм, патогенным стафилококком. Комбинированный пре- и пробиотик может быть рекомендован в комплексном лечении пациентов разного возраста и обоих полов при синдроме острой диареи предположительно инфекционного происхождения.

Ключевые слова: острые кишечные инфекции, лечение, комбинированный пре- и пробиотик.