# EVALUATION OF THE EFFECTIVENESS OF SYNBIOTICA MAXILAC®Baby IN PEDIATRIC PRACTICE

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**Abstract**

Intestinal dysbiosis in children and its correction with the help of synbiotic drugs continue to be the subject of constant discussion. This article, along with modern information about intestinal dysbiosis, its clinical manifestations and role in the life of the body, also presents the results of our personal research on the effectiveness of the synbiotic MAXILAC® Baby on the intestinal microbiota and the clinical course of diseases in children over 3 years of age (n=32) with diarrhea, constipation and atopic dermatitis (AD). It has been established that the use of the synbiotic MAXILAC® Baby for chronic diarrhea and constipation in children improves the biochemical parameters of feces, prevents the development of opportunistic microflora, corrects stool disorders and is thus a highly effective synbiotic drug for eliminating atopic and inflammatory reactions.

**Keywords**: children, intestinal microbiocenosis, dysbiosis, diarrhea, constipation, atopic dermatitis (AD), probiotics-synbiotics.

**Introduction**. The gastrointestinal tract (GIT) is one of the most complex ecosystems, inhabited by microorganisms (biotopes) with various biological properties. The microbial flora of the gastrointestinal tract is in constant dynamic equilibrium with various environmental factors, one's own body and natural resistance, which is determined by the finely balanced interaction of the cells of the digestive system, microbial flora and the immune system. Depending on the anatomical and physiological characteristics of the GIT, the age of the child, the nature of nutrition and lifestyle, this interaction in children is variable. Quantitative and qualitative changes in the intestinal microflora in children of different ages have different characteristics and in most cases do not require drug correction. However, its long-term changes, accompanied by the development of facultative flora, can lead to disturbances in homeostasis requiring therapeutic correction, and in some cases, to the manifestation of various clinical symptoms.The human microflora includes numerous microbiocenoses, which include tens and hundreds of different types of microorganisms, many times larger than all the cells of organs and tissues of the body [1, 2, 3, 6]. The total genome of bacteria in the gastrointestinal tract is 50-100 times larger than the human genome (the sum of all genetic materials found in the cells of the human body) [2, 5]. It has been established that the parietal and ventral intestinal microflora includes 395 phylogenetically different groups of microorganisms[4].

The human oral microbiome includes 619 taxa belonging to 13 phylotypes [4]. The types of microflora in children and adults are fundamentally different. An increase in the number of these microorganisms or their metabolites in a particular ecosystem or their deficiency stimulates the activation of adaptive mechanisms. However, these mechanisms are still not fully understood. This explains such a constant interest in the problem of microbiocenosis. The study of structural and functional changes in the intestinal microflora can provide the correct approach to the treatment of the underlying disease and correction of microbiocenosis from a pathogenetic point of view. The human intestine is considered the largest protective system of the body, and its microflora performs many functions: protects the intestines from colonization by nonspecific bacteria, stimulates the immune system, prevents the development of allergies, including atopic dermatitis, and inflammatory processes in the body. intestines, enhances the production of interferon, and also synthesizes vitamins A, B, K and folic acid and generally reduces the symptoms of intoxication in the body. It is known that cesarean section, artificial feeding (use of formula), taking certain medications (antibiotics, nonspecific anti-inflammatory drugs, including drugs containing paracetamol), diarrhea, etc., such situations lead to disruption of the intestinal microflora. Disturbance of the intestinal microflora can manifest itself with symptoms such as diarrhea, constipation, flatulence, nausea, belching, vomiting and abdominal discomfort. The formation and restoration of intestinal microflora is ensured by a number of methods, one of which is the use of pro- and prebiotic drugs. Probiotics are live microorganisms that represent the normal human flora (lactobacteria and bifidobacteria) and correct the intestinal microflora. Prebiotics, consisting of food ingredients consisting primarily of oligosaccharides, enhance the growth and development of normal colon microflora. In this regard, synbiotics, which include pro- and prebiotics in a certain combined form, have a mutually reinforcing effect on metabolism in the human body. Currently, there are many probiotic and synbiotic drugs on the medicinal market, among which the attention of pediatricians is most attracted by Maxilac® baby (DANISCO FRANCE, SAS) produced in France with a synbiotic effect. It is known that the biotransformation of lactose is carried out by the indigenous microflora of the gastrointestinal tract. The fact that Max-

ilak®baby-synbiotic has a unique composition consisting of bifidobacteria, as well as lactobacilli and lactic acid bacteria, pathogenetically justifies its use from the first days of life. Thus, lactobacilli in its composition prevent the growth of pathogenic microflora, provide the body's protective function and thereby naturally strengthen the immune system. In addition to participating in the synthesis of amino acids, proteins and vitamins, bifidobacteria enhance the absorption of iron, calcium ions and vitamin D. Fructopolysaccharides, playing the role of prebiotics, stimulate the growth of beneficial bacteria, suppress the development of pathogenic microorganisms, stimulate peristalsis and reduce the contamination of the intestines with toxins, thereby improving the function of the office. Its granules, released as a lyophilisate and protected by Micro MURE® (Multi Resistant Encapsulation) technology, are very suitable for use in children. Thanks to this protection, the probiotic bacteria contained in the granules enter the intestines without dissolving in the stomach, and allow the microflora of the gastrointestinal tract to be restored, in other words, the normal concentration of colonies of microorganisms from the stomach to the colon is restored. On the other hand, the absence of casein and preservatives in its composition allows this synbiotic drug to be safely used by children suffering from allergic reactions to products of this group, as well as lactose intolerance. This is the first and only synbiotic that is used from the first days of life for the purpose of forming and restoring normal microflora in case of any disorders of the intestinal microflora in children, and it contains 9 beneficial bacterial cultures in an important concentration (1 billion (1×109) CFU) for children's intestines (Table 1).

Table-1

**Composition of the synbiotic MAXILAC® Baby**

| Sachet | 1 sachet |
|---|---|
| **Probiotic microorganisms** | ≥$1\times10^9$ CFU** |
| **● bifidobakteriyalar:** | $3.3\times10^8$ CFU |
| Bifidobacterium longum Bl-05 | $1.11\times10^8$ CFU |
| Bifidobacterium lactis Bl-04 | $1.11\times10^8$ CFU |
| Bifidobacterium bifidum Bb-02 | $1.11\times10^8$ CFU |
| **● lactobacilli:** | |
| Lactobacillus acidophilus La-14 | $6.6\times10^8$ CFU |
| Lactobacillus rhamnosus GG | $1.11\times10^8$ CFU |
| Lactobacillus casei Lc-11 | $1.11\times10^8$ CFU |
| Lactobacillus plantarum Lp-115 | $1.11\times10^8$ CFU |
| Lactobacillus paracasei Lpc-37 | $1.11\times10^8$ CFU |
| Lactobacillus salivarius Ls-33 | $1.11\times10^8$ CFU |
| ● lactic acid bacteria: | $1.11\times10^8$ CFU |
| Lactobacillus lactis Ll-23 | $9.00\times10^8$ CFU |
| Streptococcus thermophilus St-21 | $4.50\times10^8$ CFU |
| Prebiotic component - fructooligosaccharides | 1,43 mg. |
| *** CFU** – colony-forming unit (an indicator of the number of viable microorganisms) | |

**Goal of the work**: To assess the effect of the synbiotic MAXILAC® Baby on the intestinal microbiota and clinical symptoms of the disease in children with diarrhea, constipation and atopic dermatitis (AD).

**Material and methods**. The studies were conducted on 32 children aged 3 to 12 years, who were combined into 3 main and 2 control groups. Main group I: 15 children (n=15) with diarrhea caused by taking antibiotics, rotavirus infection and malabsorption syndrome; In main group II: 8 children (n=8) with constipation caused by changes in diet due to travel and visits to child care facilities; III main group: 6 children with mild to moderate atopic dermatitis (AD) (n=6); I control group: 7 children with functional intestinal disorders (diarrhea, constipation); Control group II: it included 7 children with atopic dermatitis (AD) of mild and moderate severity. The distribution of children by age and gender is presented in the table (Table 2).

**Distribution of children by age and gender** table 2

| **by Gender** | **Age range** | | | | **Total** | |
|---|---|---|---|---|---|---|
| | 4-7 | | 8-12 | | | |
| | n=15 | % | n=8 | % | | |
| boys | 43 | 48,3 | 14 | 45,2 | 57 | 47,5 |
| girls | 46 | 51,7 | 17 | 54,8 | 63 | 52,5 |
| total | 89 | 100 | 31 | 100 | 120 | 100 |

When treating children included in the main groups, in addition to basic therapy, the synbiotic MAXILAC® Baby was used for 2 weeks (1 package x 2 times a day with meals) for at least 10 days. Children included in the control groups were prescribed a placebo. Analysis and statistical processing of the results were carried out using Microsoft Excel 2007, AtteStat, Statistica 10.0. In the obtained data, a difference of $p<0.05$ was considered statistically significant.

**Results**. Among patients included in group I, diarrhea is more common in children under 7 years of age ($p < 0.05$). In main groups I (diarrhea) and II (constipation), a decrease in the frequency of almost all

clinical signs was recorded during treatment. The positive dynamics noted in children with abdominal syndrome are once again confirmed by the results of a scatological study. In general, noteworthy is the gradual elimination of diarrhea in the majority of patients in group I. So, on average, diarrhea caused by rotovirus disappears on the 3-5th day of the disease, and in patients with chronic diarrhea caused by food intolerance, that is, allergic and immune dependence, on the 1-2nd day. More significant positive dynamics were obtained in group II. Despite the elimination of constipation in most children, normalization of stool occurs after the first dose of the synbiotic MAXILAC® Baby. Significant positive dynamics were also recorded in the third main group (with AD). So, in more than 50% of these patients, starting from the 2-3rd day, in addition to the disappearance of symptoms such as irritability, wakefulness, abdominal pain, stool became normal, as well as concerns such as dryness. skin, peeling and skin rashes disappear. In the coprogram of children with AD included in the main group, the number of leukocytes and mucus decreased up to 3 times, the amount of neutral fats up to 10 times, and the amount of intracellular starch up to 1-2 times. to normalize the digestive process, as well as eliminate allergic and inflammatory processes in the intestinal wall. Despite the decrease in the number of leukocytes, mucus and neutral fats in the copnogram of children in the control groups, these changes, as well as the normalization of intestinal microflora, do not reach statistically significant figures. After finishing taking the drug, the number of Klebsiella and intestinal bacteria normalizes; in 80% of these children, indicators of indigenous and opportunistic microflora are restored. Such regular indicators are recorded during microscopic examination of stool. In the results of analyzes conducted in children receiving placebo, there was no statistically significant difference in any indicator.

**Conclusion**. Based on the studies conducted, it can be concluded that MAXILAC® Baby can be used in pediatric practice as a highly effective synbiotic drug in the correction of stool disorders, as well as in the elimination of atopic and inflammatory reactions, chronic diarrhea and constipation. children over 3 years old.

**References:**

1. Bondarenko V. M. Human microflora: norm and pathology // Science in Russia. 2007. No. 1. pp. 24–26.// Бондаренко В. М. Микрофлора человека: норма и патология // Наука в России. 2007. № 1. С. 24–26.

2. Kostyukevich O. I. Influence of intestinal microflora on human health. From pathogenesis to modern methods of dysbiosis correction// Rus. honey. magazine 2008. T. 10. No. 1. P. 10–14 .// Костюкевич О. И. Влияние кишечной микрофлоры на здоровье человека. От патогенеза к современным методам коррекции дисбиоза // Рус. мед. журн. 2008. Т. 10. № 1. С. 10–14

3. Yakovenko E. P., Yakovenko A. V., Ivanov A. N., Agafonova N. A. et al. Innovative probiotics in restoring the structure and functions of the gastrointestinal tract microbiome // Consilium Medicum. Gastroenterology. 2015. No. 2. P. 5–9//. Яковенко Э. П., Яковенко А. В., Иванов А. Н., Агафонова Н. А. и др. Инновационные пробиотики в восстановлении структуры и функций микробиома желудочно-кишечного тракта // Consilium Medicum. Гастро- энтерология. 2015. № 2. С. 5–9.

4. Eckburg P. B., Bik E. M., Bernstein C. N., Purdom E. et al. Diversity of the human intestinal microbial flora // Science. 2005. Vol. 308. N 5728. P. 1635–1638.

5. Qin J., Li R., Raes J., Arumugam M. et al. A human gut microbial gene catalogue established by metagenomic sequencing // Nature. 2010. Vol. 464. N 7285. P. 59–65.

6. Turnbaugh P. J., Ley R. E., Hamady M., Fraser-Liggett C. M. et al. The human microbiome project // Nature. 2007. Vol. 449. N 7164. P. 804–810.n