

ANEMIES IN CHILDREN FROM 0 TO 3 YEARS

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The article shows the prevalence of anemia among children, based on the example of Soligorsk.

Keywords: children's population, anemia incidence, ecological causes.

In the Republic of Belarus, diseases of the respiratory system, trauma, skin and subcutaneous tissue diseases, diseases of the digestive system, as well as infectious and parasitic diseases take the leading place in the structure of the primary incidence of children. At the same time, the fact that, according to the National Statistical Committee of the Republic of Belarus, an increase in cases of diseases of various kinds of anemia is also important.

To improve the health of the younger generation, it is necessary to take active measures on the part of the state, health authorities and institutions: to increase the effectiveness of providing medical care to children, and to develop preventive programs aimed at reducing the incidence [1].

According to statistical data of the Ministry of Health of the Republic of Belarus, registered cases of anemia in children in 2016 were found to be 2566,9 per 10000 population [2]. This indicator in 2015 has increased sufficiently in comparison with previous years. Over the past three years, the incidence rate in children under 14 years of age has been recorded at a high level. In 2016, the total incidence of children under 14 years of age increased by 7,8 % compared with 2015 [2].

The study of the incidence rates of various types of anemia in children aged 0 to 3 years in Soligorsk was carried out by means of an analysis of the reports on the number of cases in the Soligorsk Central District Hospital.

The results of our study allowed us to draw the following conclusions:

1. Morbidity of the child population of the Republic of Belarus in the period from 2012 to 2016. has a significant increase: the total incidence of children increased by 32 %, primary incidence – by 45 %. On the city of Soligorsk these indicators, on the contrary, tend to decrease, but the number of children standing on dispensary records increases.

2. The deteriorating state of children's health is based on a whole range of medical, socio-economic, environmental causes.

3. The total incidence of anemia in the children's population (aged 0–3 years) in Soligorsk as of 2016 was 312 cases per 1000 inhabitants, which is several times less than in 2015 (412 cases) and higher than in 2010 (300 cases).

4. Among the various types of anemia, predominant are iron deficiency anemia, the lowest in number of cases – anemia of a mixed type.

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ENGINEERING OF BACTERIAL STRAIN PRODUCING FUSION PROTEIN

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As a result of the study, a new recombinant strain *Escherichia coli* AA17, producer of chimeric protein consisting of human annexin A5 (AA5) and bacterial adenosine deaminase (ADase) was constructed. 18 mg of purified protein was recovered from 1 liter of cultural liquid. The protein content was about 7 % of the total cellular proteins

determined using electrophoretic analysis in polyacrylamide gel. The chimeric protein is planned to be studied as a promising antitumor agent.

Keywords: fusion protein, human annexin A5, adenosine deaminase, *Escherichia coli*, promising antitumor agent.

It is known that phosphatidylserine (PS) can serve as a marker on the surface of a cancer cell, which makes it possible to distinguish it from normal cells and to carry out, if necessary, targeted delivery of various pharmacological agents to the tumor [1]. To realize the delivery of the pharmaceutical substance into the tumor, a molecular transporter capable to recognize the PS on the surface of the cancer cell is essential. Human AA5 can act as such conveyor, binding with high affinity mainly to PS [2]. AA5 can be cross-linked with anti-tumor proteins or enzymes to deliver them to the tumor.

Sufficient experimental findings collected to date allow to state that one of the key factors responsible for the formation of tumor microenvironment repressing anticancer immune response is accumulation of extracellular adenosine [2]. In our opinion, it is possible to eliminate adenosine (protecting the tumor from host immunity) with the aid of a chimeric protein containing ADase and AA5 domains. The resulting chimeric protein introduced into the body of patients suffering from cancer diseases will bind with tumor cells and decompose adenosine protecting these cells from immune response.

This study was aimed at engineering of *E. coli* strain producing protein made up by human AA5 and ADase.

At the first stage of the research, the genetic construction of the vector was accomplished by inserting the AA5 and ADase genes into the plasmid. The resulting plasmid was transferred into *E. coli* BL21 (DE3) cells and bacterial biomass was obtained.

At the second stage, the chimeric protein was isolated and purified from cell biomass by affinity chromatography on Ni²⁺-NTA resin.

At the third stage, ADase activity was determined *via* the rate of adenosine transformation into inosine.

As a result of the study, a new recombinant strain *E. coli* AA17 was constructed as a source of chimeric protein of the above-mentioned structure with molecular weight of 73,8 kDa, which corresponds to the theoretically calculated value. At the same time, 18 mg of purified protein was produced from 1 liter of cultural liquid. The protein content was about 7 % of the total cellular proteins determined using electrophoretic analysis in polyacrylamide gel.

Summing up, the bacterial strain producing chimeric protein consisting of human annexin A5 and bacterial adenosine deaminase was designed by recombinant DNA technology. Such protein has to "pull out a brake" from the human antitumor immunity and can serve as a highly effective drug for therapy of a wide range of oncologic diseases.

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ANALYSIS OF MORBIDITY OF THE POPULATION OF THE REPUBLIC OF BELARUS FROM ALCOHOLISM IN 1995-2015

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Excessive alcohol consumption in most cases is a major cause of serious diseases and social problems. The problem of alcoholism significantly affects the health and the welfare of the population. Due to high levels of alcohol consumption in the Republic of Belarus is carried out to search for new measures to prevent alcoholism.

Keywords: alcoholism, diseases, analysis, tendencies.

Today the problem of alcoholism remains relevant both in the Republic of Belarus and throughout the world. Excessive consumption of alcohol in most cases is one of the main causes of serious diseases and social problems. Republic of Belarus refers to countries with a high level of alcohol consumption and problems of alcoholism.

The purpose of the work is to analyze the incidence of alcoholism in the population of Belarus in 1995–2015.