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MESSAGE FROM THE GUEST EDITOR

Dear Reader,

We often are asked what the prime purpose of the publication is. We believe a well-functioning democracy requires an equally well-informed citizenry. Therefore, our mission is simple: to provide you with a reliable source of high quality, evidence-based information. This issue is publishing with the devoted specific articles that accepted from Uzbekistan researchers.

“Fail to plan, plan to fail” – Winston Churchill, is prophetic in preparing the journal current issue. Organizing ahead of time makes the work more enjoyable. To have the ingredients lined up ahead of time and ready to go is easier said than done. From the inception of the idea, way back in 2016 December to its implementation, many a body and mind have spent hour's together, draining physical as well as mental faculties. Slogging your life around your dreams, and to watch them come true is really an exhilarating feeling. So here, we are as we wake up to the dawn that signals the inaugural edition of Asian Journal of Research, which is dedicated to Medicine and Pharmaceutical Sciences.

I think we are definitely living in an era of an information overload, where everyone is an expert, just a fingertip away from the big 'G' but I believe that as days unfold we are going to get better and better at ways of organizing that articles with good information source.

Success requires first expending ten units of effort to produce one unit of results. Your momentum will then produce ten units of results with each unit of effort. Individual commitment to a group effort - that is what makes a teamwork, an event work, a research work. Therefore, from the backing of the management to the hard work put by the team there is no doubt that this was the fuel of Asian Journal of Research specific issue.

Thank you for your support and I will keep you posted on further developments during the year.

ISKHAKOV ELDOR DJASUROVICH

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SPECIFIC FEATURES OF ACUTE MYELOID LEUKEMIA TREATMENT IN OLD AGE PATIENTS

Manuscript Info Abstract

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Abstract. The article describes a five-year experience of the Research institute of Hematology and Blood transfusion of the Republic of Uzbekistan on treatment in 26 old age patients with acute myeloid leukemia. In this investigation was shown that from six patients at the age of 60-69 years who received therapy according to protocol "5+2", 4 (66.6%) patients has been achieved complete remission. Median disease-free survival was 25 ± 13 month. In the subgroup of 9 patients with hard comorbid status of the age 60-69 who received small doses of cytarabin ($10\text{mg}/\text{m}^2$ twice per day 28 days), in 4 (44.4%) patients there was achieved complete remission. Median disease-free survival was 60 ± 48 month. In 6 (54.5%) of 11 patients of 70 years and older who treated with small doses of cytarabine (28 days) the remission was achieved. Median disease-free survival was 13 ± 7.5 month. Treatment of the patients of aged and senile

age, on one hand, appeared to be a difficult task due to severe somatic status, multiple accompanying diseases, high frequency of primary resistance to treatment, and on the other hand, in the part of patients there may be achieved long-term overall and relapse-free survival. The old age of the patient should not be reason for refusal from performance of cytostatic therapy.

Key words: acute myeloid leukemia, old age patients, chemotherapy

Introduction

The great advances in the treatment of acute leukemia in children and young adults have been undeniably attributed to the last achievements in hematology. The results of their treatment in the subjects of adult and senile age have been still rather scarce. As the world, experience shows the 5-year relapse-free survival rate in the patients with acute myeloid leukemia (AML) at the age of 60 years accounts no more than 10-13% [1]. The cause, in opinion of many authors, seems to be considerable frequency of

unfavorable, with regard to prognostic factor, cytogenetic and molecular-genetic disorders, and frequent incidence of multi-drug resistance gene (MDR-gene) in these patients [2]. Besides, at the old age the increasing serious comorbidity (diabetes mellitus, cardial pathology and others) interferes performance of more aggressive methods of cytostatic effect on the tumoral clone. At present time, the optimal recommendations and unified protocols for treatment of acute leukemia in the old patients have been absent. The question, how to

treat patients above 80 years of age, is still open and under debate.

In some multi-center randomized studied the interesting results have been obtained in relation to dependence on aggressiveness of AML treatment in the patient of old age. Thus, according to the data of Hematological Research Center of the Russian Academy of Medical Sciences (Troitskaya V.V., et al, 2012)[3] after performance of three courses of therapy "7+3" (Cytarabin 100 mg/m² x 2 times/day, Daunorubicin 45 mg/m² for 1-3 days) with following performance of supporting treatment in the patients at the age of 60-69 years, frequency of remission achieved 50%, induction mortality – 25%, primary resistance – 25%. The patients of 70 years older were performed with small doses of

cytarabin (Cytarabin 10 mg/m² x 2 times/day, percutaneously for 21-28 days). In this case the frequency of achievement of the primary remission accounted for 12.5%, early mortality – 12.5%, primary resistance was registered in 75% of patients. The overall 3-year survival of the patients at the age of 60-69 years and over 70 years of age accounted for 11% and 8%, respectively.

In spite of not optimistic state in the treatment of aged patients with AML, we analyzed results of the treatment of acute myeloid leukemia of the aged patients receiving treatment in the wards of Scientific Research Institute of Hematology and blood transfusion of the Ministry of Health of the Republic of Uzbekistan.

Purpose of this research was to study frequency of the

achievement of primary remission, analysis of over all and relapse-free survival, development of the technique of the treatment of patients over the age of 60 years with various types of acute myeloid leukemia.

Statistics and methods of treatment. Analysis of clinical-laboratory data was performed in 26 patients with acute myeloid leukemia at the age of over 60 years (16 women and 10 men) having treatment in the period from 2010 to 2015 years in the wards of Research Institute of hematology and blood transfusion. Median of the age accounted 68 years (60-78 years), 57,7% of patients (n=15) were at the age 60-69 years and 42,3% (n=11) at the age 70 and more. According to the types of AML, variant M1-2 (by FAB-classification) was revealed in

38,4% (n=10) patients, M3-variant – 11,5% (n=3), M4 and M5-variant in 42,3% (n=11), and M7-variant – in 7,6% (n=2), respectively.

Four of 15 patients at the age of 60-69 years without severe comorbid background was performed 4 courses according to protocol “5+2” (cytarabin 200 mg/m³ by method of administration every day for 1-5 days, daunorubicin in the reduced dose 30 mg/m², 1,2 days). Two patients of them with acute promyelocytar leukemia (M3-variant of AML), parallel with protocol “5+2” were performed peroral therapy with Tretinoin (“Vesanoid”) in dose 45 mg/m² during 30 days.

The rest 20 patients at the age of 60-69 years with severe accomparning diseases (hypertonic disease, coronary insufficiency, diabetes mellitus

and others) as well as the patients at the age of 70 and more were performed courses of monochemotherapy in small doses of cytarabin (SDC) in dose 10 mg/m² x 2 times/day percutaneously, for 21-28 days with break 21 and 28 days, respectively. It should be noted that during monotherapy with small doses of cytarabin in case of leucopenia development without infectious complications, chemotherapy was not interrupted and was completed to the end according to protocol. In dependence on presence of some

or other accompanying chronic diseases, in parallel with antitumoral chemotherapy there was performed cardio-, nephro-, hepatoprotective therapy, antianginal, hypotensive, sugar reducing therapy.

Results

The results of treatment are presented in table N1.

Table N 1

Results of efficacy of differential treatment of patients with various forms of AML of the age over 60 years. (2010-2015) (n=26).

	60-69 years (n=15)		70 years and older (n=11) SDC
	«5+2» (n=6) (Without aggravated comorbidity)	SDC (n=9) (With aggravated comorbidity)	

Achievement of remission	n = 4 (66.6%) (of them 2 with M3-variant)	n = 4 (44.4%)	n = 6 (54.5%)
Induction mortality	n = 1 (16.6%)	n = 1 (11.1%)	n = 2 (18.1%)
Death in remission	n = 1 (16.6%)	-	n = 1 (9.0%)
Primary resistance	n = 1 (16.6%)	n = 4 (44.4%)	n = 3 (27.2%)

Table 1 shows in the subgroup of 6 patients at the age of 60-69 years receiving therapy according to protocol "5+2", in 4 patients it has been managed to achieve remission of disease. Unfortunately, one patient with M3-variant of AML died during period of remission (12 months after its achievement) due to hemorrhagic stroke. In the rest 3 patients remission lasted 18, 26 and 38 months, respectively. One patient dead during period of

remission induction, in one patient (M5-variant of AML) there was registered resistant progressing of disease.

In the subgroup of 9 patients of the age 60-69 who received small doses of cytarabin, in 4 patients there was achieved complete remission of disease. Duration of remission accounted for 12, 36, 60 and 108 months, respectively. In the first patient during period of remission induction the septic shock

developed resulting in death of patient. In 4 patients (with M4 and M5 variants of AML) there was established primary resistance of disease.

Of 11 patients of 70 years and older in 6 (all were without initial leucocytosis, with M1 and M2 variants AML) on the background of therapy performed with small doses of cytarabine (28 days) the remission was achieved. One of them died in the period of full remission due to acute myocardial infarction. In the rest 5 patients duration of remission was 6,9,14, and 21 months, respectively. Two patients died during the period of remission achievement due to sepsis. In 3 patients (all with M4 and M5 variants of AML with initial leucocytosis) treatment appeared to be ineffective.

In the majority of cases induction and maintenance treatment was complicated by development of cytopenic syndrome, required performance of full supportive therapy – blood component therapy, staged antibacterial therapy. Duration of bone marrow aplasia during performance of inducing therapy by protocol “5+2” varied from 11 to 21 days, on the average 14 days, during period of consolidation – on the average 11 days. During maintenance chemotherapy with small doses of cytarabine in the period of induction duration of myelotoxic aplasia of bone marrow varied from 9 to 18 days, on the average, 12 days.

Conclusion.

Treatment of the patients of aged and senile age, on one hand, appeared to be a difficult task due to severe somatic status, multiple

accompanying diseases, high frequency of primary resistance to treatment, and on the other hand, in the part of patients there may be achieved long-term overall

and relapse-free survival. The old age of the patient should not be reason for refusal from performance of cytostatic therapy.

REFERENCES

1. Goldstone AH, Burnett AK, et al. Attempts to improve outcomes in acute myeloid leukemia (AML) in older patients: the results of the United Kingdom Medical Research Council AML 11 trial. *Blood* 2001;98:1302-1311.
2. Buchner T, Hiddeman W, Shoch C et al. Acute myeloid leukemia (AML): treatment of the older patients. *Best Pract Res Clin Hematol* 2001;14:139-151.
3. Troitskaya V, Parovichnikova E, Isaev V et al. Age may be a treatment stratification criteria in the elderly acute myeloid leukemia patients. \ Acute leucemias XIII: Biology and treatment strategies. Munich, Germany, 2011. *Ann Hematol* 2011; 90 (Suppl 1): 18.

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CAUSES OF FETAL LOSS SYNDROME AT DIFFERENT GESTATION TIMES

Manuscript Info Abstract

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Abstract

According to many researchers in the structure of reproductive losses, the group of unclear etiology of the causes of fetal death is from seven to 50%. More than half of the patients have a combination of various reasons. Complex socio-economic conditions, early sexual intercourse, the spread of sexually transmitted infections, as well as an increase in the number of pregnant women of senior reproductive age make the problem of miscarriage extremely serious. The causative agents of intrauterine infection were bacteria, viruses, rickettsia, fungi, parasites, virtually all cases of intrauterine infection were of a polymicrobial nature and the isolation of individual microorganisms is to some extent conditional, genital infection in pregnancy causes 1/3 of stillbirths, and in 92.7 % of cases develop certain manifestations of fetoplacental insufficiency. In recent years, one of the leading pathogens of fetal infections are conditionally pathogenic microorganisms. At the same time, the authors believe that a bacterial infection such as tuberculosis, syphilitic, gonorrhea, etc. does not play a significant role in premature termination of pregnancy.

Health Science

Generalization of Scientific Results

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Key words: reproductive loss, intrauterine fetal death, gestation

According to many researchers, in the structure of reproductive losses, a group of unclear etiology of the causes of fetal death is from 7 to 50%. More than half of the patients have a combination of various reasons. The complex socioeconomic conditions, the early onset of sexual activity, the spread of sexually transmitted infections (Makarov OV, 2007, Romero R., 2007), as well as the increase in the number of pregnant women of senior reproductive age, make the problem of non-pregnancy extremely serious (Kulakov VI, 2007, Lineva OI, et al., 2009). By the terms of gestation, the incidence of miscarriage in the structure of loss of pregnancy in the first trimester is 50%, in the second trimester - 20%,

in the third trimester - 30% (Dobrokhotova Yu.E., 2007)

According to the forecasts of demographers, the negative population growth, due to high birth rate and high mortality, including perinatal, will continue in the first decades of the XXI century. The predominant majority of all cases of perinatal death is the antenatal fetal death (AFD). From the medical point of view, it is important that the antenatal fetal death by virtue of its complications poses a threat to subsequent pregnancies, the usefulness of offspring, and sometimes to the life of the mother (3,7). In this way, the problem of antenatal fetal death is important both social and medical. The severity of complications of antenatal fetal death is directly proportional to the duration of

gestation and the length of stay of the deceased fetal egg in the uterine cavity. There are cases when a dead fetal egg lingers in the uterus for an indefinitely long time. Such a condition is known as missed abortion (MA), frozen pregnancy, missed abortion or missed labor, depending on whether intrauterine death occurred before 28 weeks of pregnancy or later. In recent years, the concept of "fetal loss syndrome" is widely used in foreign literature, which includes: 1) one or more spontaneous miscarriages or undeveloped pregnancies at a period of 10 or more weeks; 2) two or more spontaneous abortions at the preembryonic and early embryonic stage until 8 weeks of pregnancy, when the anatomical, genetic and hormonal causes of miscarriage are excluded.

The difficulties that arise when eliminating the fetal egg that

was lost, and practical recommendations for their overcoming, are mentioned in the classical works of Soran of Ephesus (II century AD). One of the sections of the Treatise on Surgery and Instruments by the largest doctor of the Arab East, Abul-Kasim (X-XI centuries AD) is entirely devoted to the extraction of a dead fetus (Az-Zahravi, 1983). In the domestic sources the first information about the frozen pregnancy dates back to the 16th-17th centuries. In the first manuscript on obstetrics in Russia, "Obstetric Book", published in the Solovetsky monastery at the end of the XVII century, describes the causes of this pathology and gives recommendations on therapeutic measures: «Почему познати плод мертвой и чем его изогнати» and «Как плод мертвой из утробы выняти» (Anikin IL, Tsvelev Yu.V., 1993). In 1847, N. Oldham and A.

MacClintok were first used the special term "missed labor" to describe the situation in which intrauterine fetal death took place without its elimination from the uterus at the term of pregnancy more than 6-7 months,. In 1872, J.M. Duncan divided it into two terms: "missed abortion" and "missed labor", depending on whether the fetus died before 28 weeks of gestation or later. Based on clinical observations and pathoanatomical studies, and also taking into account the complications that occur when the uterus is emptied and proceeding from the interests of practical obstetrics, each case of diagnosed intrauterine death of an embryo or a fetus, regardless of the length of stay it in the uterus, to be considered an abortive abortion, or failed birth. The prolonged intrauterine delay of the fetus or embryo has a negative impact on

the maternal organism, causing a pathological condition - a dead fetus syndrome, the main manifestations of which are oppression of the uterine contractility and hemostasis disorders, which are dangerous not only for health, but for the life of a woman. The frequency and severity of the latter increase as the gestational age and duration of the disease increase (5,8).

Antenatal fetal death is one of the main components of perinatal mortality, adversely affects the health of women (Pestrikova T.Yu., 1994; Khodzhaeva ZS, 2003; Mazor M. et al., 1986). In recent decades, in the etiological classification of antenatal fetal fetus is possible to find a much larger range of causes of this pathology.

The average age of women in the main group was 25.92 ± 0.21 years, in the control group it was

24.73 ± 0.51 (P> 0.05). Most of the women were in the prime of their reproductive age. However, attention is drawn to the significant difference in the proportion of women with the fetal antinatal death in extreme periods of childbearing age in the main and control groups. Thus, the frequency of fetal antinatal death of women under 20 in the main and control groups was 7.9% and 2.9%, respectively, older than 35 years - 14.0% and 7.3%. In this way, according to our data, the age of the mother to 21 years and over 36 years is a risk factor for the occurrence of an MA (Pk <0.05).

The women of the main group had significantly more body weight - 67.50 ± 0.41 kg, than in the control group - 62.81 + 1.01 kg (P <0.01), and growth, on the contrary, is slightly lower - 157 , 19 ± 0.34 cm versus 161.02 + 0.71 cm (P <0.02).

The mass-growth index G. Greve (1978), calculated by the formula mass (kg) / height² (m²) and making up in norm in fertile women 23.0 ± 0.1 kg / m², in the main group was on the average 25, 71 ± 0,11 kg / m², in the control group - 23.90 + 0.22 kg / m² (P <0.001). The obtained results give grounds to believe that among pregnant women with MA reliably more frequent women with metabolic disorders.

Miscarriage of pregnancy by type of abortion, according to our data, was most often observed in the first trimester of pregnancy - in 48.6% of women, in the second trimester - in 31.3% and in the third trimester - in 12.1%. It is noteworthy that in 36.1% of women in the second trimester of gestation fetal death was observed in the period from 14 to 20 weeks. Presumably, this is due to a defect

in the immature placenta, when as a result of a drop in the level of the chorionic gonadotropin (CHG), steroidogenesis in the ovaries and trophoblast fades.

Periodic fluctuations in the frequency of occurrence of fetal death demonstrate the seasonal nature of this pathology. As a result of our study, a clear connection was found between the onset of fetal death and the conception season: winter (26.6%), spring (21.2%), summer (32.9%), autumn (17.3%) ($P < 0.05$). The maximum occurrence of MA falls on the periods corresponding to the conceptions that occurred at the "junctions" of the ovulatory and anovulatory cycles, i.e. in the periods of change of seasons of the year. Thus, excluding conception in seasonal periods of desynchronization of ovulation and the process of maturation of the ovum, according

to our data, this is the end of spring, summer begins the fall, and it is possible to significantly reduce the amount of fetal death in women in the summer months. An interesting fact is the dependence of the number of unfavorable outcomes of pregnancy on the woman's term of birth: in the main group, there were significantly more pregnant women were born in the spring and autumn ($42.8 \pm 2.2\%$ vs $28.7 \pm 4.1\%$ with $P < 0.01$). According to the research of V.M. Sidelnikova et al. (1988) in the group with the miscarriage occurs in 2 times more than women born in autumn. Since the frequency of anovulatory cycles is particularly high during the onset of menstrual function, as well as in the premenopausal period, an indirect confirmation of this is the fact that the incidence of MA in elderly

pregnant women, as well as in adolescents, increased.

Menstruation in women of the main group was irregular in 18.8% of cases, and in most cases (10.4%) since menarche, whereas in the control group only (6.1%) women had irregular menstrual cycles. In the main group, the normoporous menstrual cycle (21-35 days) was noted in (85.3%) patients, antepointing (less than 21 days) - in (2.8%), postponing (more than 36 days) - in 11.8%. The menstrual cycle in pregnant women in the control group was significantly more durable in the control group - the normopointing menstrual cycle was detected in (93.4%) of women in 6.1% of the patients of the main group who had a secondary manifestation due to the inflammatory processes of the uterus after childbirth and abortion. Since the menarche, scanty

menstruation has been noted in (2.4%) patients with congenital anatomical defects in genitalia (genital infantilism), malformations of the uterus, etc. Similar indicators in the control group were significantly lower in half. Painful menstruation was detected in (11.9%) of women in primary and in (5.2%) women in the control group ($P < 0.05$).

In general, violations of menstrual function were significantly more often recorded in the group of patients with placenta death - in 41.4% of cases ($P_k < 0.01$), which was a consequence of dysfunction of the hypothalamic-pituitary-ovarian axis, caused inadequate adaptation of pregnancy and, as a consequence, development of embryo and fetopathy. Thus, later menarche, the prolonged development of the menstrual cycle, various violations

of ovarian-menstrual function are risk factors for placenta death. When assessing the gynecological history, it is established that the frequency of detection of various diseases of female genital organs in patients of the main group is significantly higher in comparison with the control group (54.4%) and (23.2%), respectively ($P < 0.001$). At the same time, more than half of the women in the main group (40.4%) suffered from inflammatory diseases of the genitals. So, according to O.F. Serova et al. (2005), the incidence of inflammatory diseases of the pelvic organs in women with non-pregnancy is 55-70%. N.K. Tetruashvili (2003) noted that in women with habitual overweighting outside of pregnancy, the diagnosis of chronic endometritis histologicis was verified in 73.1% of cases;

According to V.V. Gnipova et al. (2003), chronic endometritis is detected in 33-35% of women with miscarriage. In this case, chronic endometritis is accompanied by a decrease in the sensitivity of the endometrium to steroids due to the weakening of expression of receptors to progesterone and estrogen in stromal cells.

In addition, in the group of patients with undeveloped pregnancy, the frequency of infertility is significantly higher (6.1%), ovarian dysfunction (18.8%), genital infantilism (1.8%), uterine fibroids (2.5%), malformations of female Genital organs (2.1%) than in the control group -2.2%, 6.1%, 1.2%, 0.7% and 0.7% of cases, respectively.

It is known that extragenital diseases and pregnancy are not a simple combination of two states of a woman's organism: how

pregnancy can exacerbate already existing chronic diseases, and often both their first clinical manifestation and extragenital diseases can have a negative effect on the course of pregnancy and the fetal condition of the fetus. Extragenital diseases in the presence of antinatal fetal death were noted in (55.5%), with a favorable course of pregnancy and childbirth - in (28.7%) of the examined women.

Various kidney diseases were noted in (9.8%) women in the main group and in (5.8%) in the control group ($P > 0.05$). Attention is drawn to the fact that chronic pyelonephritis in history was, as a rule, without exacerbation in the gestational period. Chronic pyelonephritis, as well as gestational, was observed with the same frequency as in the population.

In addition, the cause of fetal loss syndrome may be violations of hemostasis - acquired or genetically caused, occurring, according to a number of authors, in 68-77% of cases of miscarriage (Matveeva TE, 2002; Bitsadze VO, 2003; Baymuradova SM, 2005; Girling, J., deSwiet, M., 1998). According to NA. Nigmatulina and V.I. Zhuravleva (2004), occupational hazards in the course of this pregnancy in the form of work with chemicals were found in 13.5% of MA cases; Work with a computer in the early stages of pregnancy was noted in 21.6% of women with MA.

As is known, human activity is carried out under frequently changing environmental conditions, which requires constant activation of compensatory mechanisms. However, the environment is not always neutral, and therefore environmental, as

well as bad habits have a certain effect on the reproductive function of the female body. Many authors note the role of "microelementoses" (a combination of diseases and syndromes caused by excess, deficiency or imbalance of microelements) in the genesis of an undeveloped pregnancy (30,20,14). According to their data, such harmful substances of the environment as copper, zinc, magnesium and nickel are deposited in the biological environment of pregnant women and have an embryocidal effect, and the appearance of lead compounds in the body can cause placental necrosis and provoke miscarriage. (22,40 ,5)

J.S. Amirova (2006), every fifth woman with a genital infection ends with a spontaneous interruption of her pregnancy, which is almost six times more

likely than in the absence of an infectious factor (Kan NE, 2007). In addition, genital infection in pregnancy causes 1/3 of stillbirths, and in 92.7% of cases, certain manifestations of fetoplacental insufficiency develop (Amirova Zh.S., 2006). Under the influence of bacterial invasion, the formation of proinflammatory cytokines by the cells of the amnion, chorion, decidual and fetal tissues increases with the subsequent release of prostaglandins and the development of birth activity. In our study, we used the results of bacteriological, histobacterial analyzes of abortus tissues and placenta, identification in the pathogen material with monoclonal antibodies by the method of enzyme immunoassay (ELISA), the culture virological method of the study, the determination of specific antibodies of class IgG and IgM in

the blood. The causative agents of intrauterine infection were bacteria, viruses, rickettsia, fungi, and parasites, that is, almost all cases inside the uterine infection were of a polymicrobial nature and the isolation of individual microorganisms is, to some extent, conditional, but this is necessary to analyze the data. The average frequency of detection in women of the main group of causative agents of intrauterine infection was: cytomegaloviruses - 38.2%, chlamydia - 30.9%, mycoplasmas - 25.8%, mushrooms - 25.4%, opportunistic flora (Escherichia, Klebsiella, Proteus And others) - 25.2%, herpes simplex virus types I and II types-14.2%, toxoplasma - 5.3%, etc. T.Yu. Kornilov et al. (2005) note a high incidence of microbial and viral associations in women with miscarriage, most often ($66.6 \pm 1.9\%$), associations of

opportunistic microorganisms in combination with fungi of the genus Candida, ureaplasmas, chlamydia and mycoplasmas; the frequency of bacterial-viral associations was $11.6 \pm 1.3\%$ of cases. It is important to emphasize that in women with MA, cytomegalo-viruses prevailed among infectious pathogens (34.8%), while in patients with spontaneous abortion and premature births, opportunistic fungi and bacteria (30.8%) prevailed. Infectious diseases of pregnant women have an unfavorable effect on the fetus either during direct exposure to the pathogen, causing primary fetopathy, or as a result of placenta damage, leading to the development of placental insufficiency and secondary fetopathy. In the opinion of the authors, in recent years, one of the

leading pathogens of fetal infections are conditionally pathogenic microorganisms. (9,5,6,8,) At the same time, the authors believe that a bacterial infection such as tuberculosis, syphilitic, gonorrhea, etc. does not play a significant role in premature termination of pregnancy. However, according to our data, intrauterine fetal death was detected in 39 pregnant women with different bacterial in

combination with viral infection in the period from 14 to 29 weeks of pregnancy. Pregnancy should be planned at normal indicators of the functional state of the organs of the reproductive system of women and men. When a new desired pregnancy occurs, the woman is hospitalized in the hospital immediately after the diagnostic confirmation of the latter, as well as in critical and individually critical gestational terms.

References

1. Abdullaeva MA Prevention of intrauterine infection of the fetus in pregnant women with chlamydia-ureaplasma infection // News of dermatovenerology and reproductive health.-2008.-No.1-P.12-14.
3. Abdurahmanova F.M. Neuro-exchange-endocrine disorders in girls with the pathology of the development of the reproductive system // Pediatrics. - 2003.-No.1-S-69-72.
4. Abu Sarah Khalil Ahmad, Lakatosh V.P. The status of indices of humoral and immune status in women with a disease with urogenital mycoplasma // Journal of Scientific Affairs of the Association of Obstetricians and Gynecologists of Ukraine .- Kiev .- "Intermed" .- 2007.- P. 5-9.
5. Amirova Zh. S. A system of cytokines in pregnant women with a persistent and recurrent threat of abortion // J. Bulletin of New Medical Technologies. - 2006. - T. 13.- № 4. - P. 66-67.
6. Amonov II, Ashurova NG Features of the hormonal characteristics in women with hyperprolactinaemia / / Journal "Doktor axborotnomasi" - 2009.-№3.-S. 258-262
7. Alekseev LP, Boldyreva M.N. Revision of the concept of the role of HLA antigens in the physiology and pathology of the reproductive process // Journal of Physiology and Pathology of the Immune System. - 2004.-T.8, No. 1.-P.44-51.
8. Arzhanova ON, Shlyakhtenko TN, Selkov SA The role of antiphospholipid antibodies in the pathogenesis of miscarriages // Journal of Obstetrics and Women's Diseases. - 2002. - T. 51.- № 2. - P. 18-22.

9. Artykkhodzhaeva G.Sh., Eshimbetova G.Z., Asatova M.M. Hormonal and immune aspects of formation of ovarian insufficiency in women with miscarriage of pregnancy by diffuse-non-toxic goiter // Russian bulletin of obstetrician-gynecologist. - 2001.-No.1-C.12-15

10. Abdullaeva D.D. The use of Fraxiparin in pregnant women with multiple births with antenatal loss of one of the fetuses. Proble reprod 2001; 1: 47-48

11. Akhmedova E.M. Hyperhomocysteinemia in pregnant women with gestosis: Author's abstract. The dissertation of the candidate of medical sciences M 2003; 15.

12. Abbasi Haysam. The importance of prenatal detection of various forms of pathological changes in the hemostasis system for the prevention of thromboembolic complications in obstetric practice: Author's abstract. The dissertation of the candidate of medical sciences M 1995;

13. Antibodies to phospholipids and fetal loss syndrome, Ed. ADMakatsiya / Antiphospholipid syndrome in obstetric practice. - M., 2001. - P.209-252.

14. Aparzin, E.V. Pregnancy and childbirth in young mothers / E.V. Aparzin, B. Naranzetsag, N.V. Protopopova // Thesis report V Russian forum "Mother and Child", 2003. Moscow: - 2003. - P. 17-18.

15. Ashurova SA, Yakubova OA, Nezametdinova MM To the issue of protection of reproductive health of girls // Journal "Doktor axborotnomasi".-2009.-№3.-With. 292-293

16. Bagizheva NV, Soyunov MA, Dimitrova V.I. In addition, others. Tactics of management of women with an undeveloped pregnancy. Mather. Sixth Russian forum "Mother and Child". M 2004; 22-23.
17. Baymurova S.M. Pathogenesis, principles of diagnosis, prevention and therapy of repeated fetal losses caused by acquired and genetic defects of hemostasis: Dissertations of the doctor of medical sciences - M., 2006. - 260 p.
18. Bapaeva GB, Mamedalieva NM, Dzoz L.S. The role of determining growth factors in predicting preterm births. Reproduction problems. 2005. - No. 6. - P. 7-12.
23. Bitsadze V.O. Principles of diagnostics and pathogenetic prophylaxis of the main complications of pregnancy caused by thrombophilia: the Dissertation of the doctor of medical sciences - M., 2003. - 268 p.
25. Budanov PV Actual problems of treatment of pregnant women with recurrent chlamydial infection // Journal of Attending Physician. - 2007. - №10. - P. 78-80.
26. Buinova AN, Moskalev AV, Osipova ON, Potapova LA Levels of cytokines as a factor predicting the course of pregnancy / / Journal of Medical Immunology .- 2005.- T. 7.- № 2-3. P.181 -182.
27. Buinova AN, Moskalev A.V. Immunoglobulins A, M, G, E as factors predicting the course of pregnancy in the first trimester / / Russian Immunological Journal -2008.-T.2 (11) .- № 2-3.-C. 285
28. Dolgushina N.V., Makatsaria A.D. Viral infections in pregnant women. A guide for doctors. M: Triad-X 2004.

29. Gabidulina TV, Timoshina E. L., Yuriev S. Yu., Mahmutkhodjaev A. Sh. Effect of urogenital infections on the course of pregnancy and the condition of the fetus and the newborn. // Journal of the Bulletin of the Siberian Medicine. - 2002. - T. 1.- № 1. - P. 84-88.
30. Gadieva F.G. Interrelation of the immune and endocrine systems // Obstetrics and Gynecology. 2001.-No.1-P.11-13.
31. Gazieva IA, Chistyakova GN Immunological aspects of the pathogenesis of fetoplacental insufficiency // Journal of Gynecology, Obstetrics and Perinatal Questions. - 2009. - No. 1.- P. 57-63.
32. Gazieva IA, Chistyakova GN The state of factors of nonspecific resistance in pregnancy complicated by gestosis of varying severity // Immunology. - 2004. - T. 25.- №6. - P. 367-370.
33. Gankovskaya LV, Bakhareva IV, Kovalchuk LV // The role of Toll-like receptors in pregnancy pathology: Proceedings of the 11th All-Russian Scientific Forum with International Participation of Academician VI Ioffe "Days of Immunology in St. Petersburg" -Peterburg "/ Medical immunology. - 2007. - T. 9 .- № 2/3. - C. 256-257.
34. Gankovskaya LV, OV Makarov, Kovalchuk L.V. The role of mechanisms of innate immunity in the case of miscarriage of infectious genesis // Zhurnal Allergology and Immunology .- 2007.-T. 8.-No. 1.- 122
35. Gankovskaya LV, Kovalchuk LV, Bakhareva IV Cytokines in pregnant women with viral infection // Russian Medical Journal. - 2008. - No. 6. - P. 22-24.

36. Gasparian ND, Kareva EN, Logutova LS Influence of antigestagens on the level of cytokines in blood plasma under terminated pregnancy // Russian bulletin of obstetrician of gynecologist. - 2002. - № 2. - P. 4-6.

37. Gafarova D.H. State of the immune system of adolescent girls with a delay in physical and sexual development // Journal of Theoretical and Clinical Medicine.-2007.-No. 2.-P.49-51

38. Hypothyroidism and hyperprolactinaemia / NN. Tkachenko, V.V. Potin, S.V. Beskrovny, L.G. Nosova et al. / Journal of the Obstetrician and Gynecologist - 1989. - No. 10. - P.40-43.

39. Govallo V.I. Immunology of reproduction. - M.-1987. - 187-193 p.

40. Davydova NI, EA Mikhnenko, Komarov EM. Influence of hormonal deficiency of ovaries on morphofunctional characteristics of endometrium in women with impaired fertility // Russian Journal of Immunology. - 2007. - v.9.- №4. - P. 77.

41. Demina TN, Mailian EA, Gyulmamedov VA Modern views on the immunology of the gestational period / / Journal of Women's Reproductive Health. 2003.-No. 1 (13) .- P. 43-48.

42. Demyanov AV, Kotov A.Yu., Simbirtsev AS Diagnostic value of studies of cytokine levels in clinical practice // Journal of Cytokines and inflammation.-2003.-No. 3.-C.20-35

43. Dolgushina N., Makatsaria A. Conducting pregnancy and childbirth in patients with viral infections // Journal of the attending physician. - 2007. - No. 8. - C. 2-3.

44. Dotsenko A.A. Participation of complement components in the process of fertilization // Russian Immunological Journal.-2008.-T.2 (11) .- № 2-3.-C. 289

45. Dorofeeva NK, Posiseeva LV, Sotnikova N.Yu. Changes in the functional activity of peripheral neutrophils in pregnant women in the process of preparing the organism for childbirth // Russian Immunological Journal.-2008.T.2 (11), No. 2-3.-C. 289.

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STUDY OF ACUTE AND CHRONIC TOXICITY OF THE DOMESTIC DENTAL IMPLANTANT FROM TITAN IN EXPERIMENTAL ANIMALS

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Abstract. In paper authors try to explore study of acute and chronic toxicity of the domestic dental implanting from titan in experimental animals, the ways of improvement

Key words: dental implants, chronic toxicity, acute toxicity, implanting on experimental animals, bioactive coating

The actuality of dental implantation now is undeniable, but the problem of rejection of implants with bone tissue at early

and late terms has not been finally solved. The ideal implant surface in terms of long-term and reliable functioning is one that comes into

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direct contact with the bone tissue without forming a fibrous layer. This way of interaction of the implant with bone tissue is called osseointegration [1, p.64; 3, p.246].

To enhance the process of osseointegration, the use of plasma-dusted nanostructured porous-powder titanium and hydroxyapatite layers on the intraosseous surface of the implant significantly improves their qualitative indices [2, c.8].

To date, domestic dental implants developed by Uzbekistan (under the grant of ATCC 28.9) have no bioactive coverage, which have a good effect on osseointegration.

The aim of the study was - to prove the effectiveness of the bioactive coating of the domestic dental implant based on experimental studies.

Material and methods.

To study the chronic toxicity of the domestic titanium implant, non-linear, healthy, sexually mature 10 rabbits were used.

The powder of tricalcium phosphate ($\text{Ca}_3(\text{PO}_4)_2$) was used as calcium-containing coating. Tricalcium phosphate (TKF) is a tertiary calcium phosphate, also known as bone ash. This phosphate serves as a rich source of calcium and phosphorus, which are in a form accessible to the cells.

Electrolytically precipitated calcium phosphate coating was prepared on the Ti cathode plate at 52 ° C for 10 hours in a TCP (pH 7.0 buffer) supersaturated solution with a supported current of 2.0 mA / cm² in galvanostatic installation.

All animals were fed on a standard diet, in accordance with applicable regulations. The animals were divided into two groups. The

first group - control, (6 rabbits), the second - the main (6 rabbits). The control group of animals was not subjected to surgical intervention. The main group of animals was implanted with titanium into the iliac bone. In the animals of the main group before the operation, as well as on the 7th, 14th and 28th days and 3 months later, the general condition, the expanded blood test for erythrocytes, hemoglobin, leukocyte formula, biochemical blood indices were studied. Similar blood tests were performed in the animals of the control group. The experimental animals of the main and control groups were in the same conditions. The animals were removed from the experiment after 1,2,4 months.

The statistical processing of the material, the construction of graphs and tables were made on a

personal computer with an Intel Pentium IV processor. Calculations were performed in the MS Excel spreadsheet editor in Windows XP.

Results and its discussion. In chronic toxicity study found that domestic dental implant made of titanium into the iliac bone of rabbits did not cause any changes in the general condition and behavior of animals: they remain active, food eaten completely, drink as necessary, normally respond to touch, pain and light Irritation. When observing animals, there were no changes in the size of the pupil, muscle tone and tail position, coordination of movements, appearance of lacrimation and salivation. The appearance of the hair and skin during the experiment remained unchanged. Operating wound in all experimental animals after the implantation of the domestic dental

implant made of titanium was dry, heal by primary intention.

Blood tests in the control group of animals at 7, 14, 28 days and 3 months. After the operation showed that the number of red blood cells remained unchanged. In the control group was $4.4 \pm 0.5 \times 10^{12}$ L in the main group of rabbits

in the postoperative period of $4.2 \pm 1.2 \times 10^{12} / 1$ to $4.45 \pm 0.8 \times 10^{12} / 1$. A significant change in hemoglobin was observed up to 28 days. In the control group, it was 61.5 ± 7.8 g / l, and in the main group on the 7th, 14th, 28th day, after 3 months, ranged from 68.0 ± 1.5 g / L to 79.0 ± 6.1 g / l (Table 1).

Table 1

Blood indices in experimental animals with the installation of a domestic dental implant of titanium

Indicators	- s controlgroup	After operation			
		On the 7th day	On the 14th day	On the 28th day	in 3 months
Erythrocytes $\times 10^{12}/1$	4.4 ± 0.5	4.2 ± 0.2	4.4 ± 0.6	4.2 ± 0.8	4.4 ± 0.5
Hemoglobin $2 / L$	61.5 ± 7.8	$79.0 \pm 6.1^*$	$79.3 \pm 1.3^*$	$73.0 \pm 0.8^*$	68.0 ± 1.5
Leukocytes $\times 10^9 / 1$	7.5 ± 0.8	7.6 ± 0.3	8.4 ± 1.2	8.1 ± 0.9	6.9 ± 1.0
Neutrophils young%	1.2 ± 0.6	$2.1 \pm 0.4^*$	0	0	2.0 ± 0.6

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Neutrophils, st ab%	7.7 ± 3.6	8.4 ± 2.0	4.0 + 1.8	11. 0 + 1.5	4.0 ± 1.4
Segmented neutrophils%	31.0 + 5.0	17,0 ± 2,1 *	9.1 ± 0.9 *	12, 0 ± 1.5 *	22.0 + 1.8
Eosinophils%	6.7 ± 2.9	6.3 ± 1.3	4.0 ± 1.5	1.0 ± 0.8	5.0 ± 0.9
Monocytes%	1.7 ± 0.9	2.1 + 0.8	1.3 ± 0.8	0	1.5 + 0.8
Lymphocytes %	51.0 ± 2.9	60,0 + ZD	81. 3 + 0.8 *	69. 3 ± 0.9 *	61.0 ± 3.4

Note: * - the difference is significant in comparison with the control group at $P < 0.05$.

In the control group of rabbits, the number of lymphocytes was $51.0 \pm 2.9\%$, in the main group of animals a week after installation of nanostructured titanium - $60.0 + 3.1\%$, after 14 days - $81.3 \pm 0.8\%$ and 28 days - $69.3 \pm 0.9\%$. At the time of the study at 3 months, the number of lymphocytes in the operated animals was within the normal range.

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Against the background of an increase in the percentage of lymphocytes in the first month after the operation, a significant decrease in the percentage of segmented neutrophils was observed in experimental animals. In the control group, segmented neutrophils were $31.0 \pm 5.0\%$, and in the main group on the 7th day - $17.0 + 4.1\%$, on the 14th day - $9.1 \pm 0.9\%$, on The 28th day - $12.0 + 1.5\%$. After 3 months after the operation, there was no significant

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difference in comparison with the control group.

From the side of the total number of leukocytes, young and stab neutrophils, eosinophils and monocytes, no changes were observed.

The study of biochemical blood indices of experimental animals prior to surgery and at different times after the installation of a domestic dental implant from

titanium showed a significant decrease in the total protein in the first 14 days after the operation from 61.5 ± 0.3 g / l to 63.1 ± 0.5 G / l. During these periods, an insignificant increase in the number of albumins was observed from $56.7 \pm 2.0\%$ to $70.6 \pm 0.8\%$ (control - $49.7 \pm 2.5\%$) (Table 2).

table 2

Biochemical blood indices in experimental animals in dynamics with the installation of a domestic dental implant of titanium

Indicators	Control Group	After the operation on time			
		7 th day	14 t h day	28- th day	in 3 months
Total protein, g / l	72.6 ± 0.7	63.1 ± 0.5	61.5 ± 0.3	77.6 ± 0.1	78.7 ± 2.9
Albumins,%	49.7 ± 2.5	70.6 ± 0.8	56.8 ± 2.0	48.0 ± 1.9	49.3 ± 0.7
Alfaglobuliny%	22.7 ± 1.2	$10.6 \pm 1.2^*$	20.0 ± 1.9	$13,5 \pm 1,8^*$	16.5 ± 2.4

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Bettaglobuli ny%	11.0 ± 1.7	2.6 ± 0.2 *	17.0 8 ± 1.7	16.5 ± 6.4	19.8 ± 8.8
Gammaglob ulin%	16.6 ± 0.4	16. 0 ± 0.8	6.1 ± 0.2 *	24.2 ± 1.1 *	14.3 ± 0.33

Note: * - the difference is significant in comparison with the control group at $P < 0.05$.

This occurred against a background of a significant decrease in the percentage of γ -globulins from $16.6 \pm 0.4\%$ (control) to $6.1 \pm 0.2\%$ (on the 14th day after the operation). In the subsequent terms of the study (after 28 days and after 3 months), the γ -globulin values were within the normal range. From protein fractions of blood, the percentage of α -globulin decreased by a factor of two on the 7th day and by 1.7 times on the 28th day. While a decrease in β -globulin was observed on the 7th day and 3 months after the operation ($P < 0.05$).

Consequently, after the experimental animals of domestic titanium were placed in the iliac bone, some deviations of the studied parameters of the peripheral blood from the initial ones were observed within 28 days after the operation. In terms of the study 3 months after the operation, all parameters converge with the parameters of the control group of animals.

The above changes in the peripheral blood in the post-operation period are a natural reaction of the body to an operating trauma.

Thus, the implantation of the domestic dental implant from titanium brand into the organism of

experimental animals is not accompanied by changes in the indices of red and white blood, biochemical indices. Domestic dental implant from titanium in the body of experimental animals, does not cause acute and chronic toxicity, remains tolerant, does not cause degenerative-destructive processes. An intensive extravascular blood formation is marked around the implant, intensification of the process of calcification of the newly formed bone tissue due to active osteoblasts.

References

1. Matveyeva A.I, Volkova T.I Clinico-morphofunctional evaluation of the condition of gum tissue during prosthetics with the use of implants // Stomatology. -2007. -№2. -FROM. 63-65.
2. Saranchina EB, Loginov AG, Gorchakov VN, Olesova VN Energy metabolism of blood lymphocytes during implantation of titanium nickellide // Dental Journal. - 2001. - №5. - P. 6-10.
3. Experimental substantiation of the use of porous permeable implants for the replacement of postosteomyelitis defects of the mandible // IDTazin, PGSysolyatin, V.E.Günter // New biocompatible superelastic materials and new medical technologies in dentistry: materials of the international conference. - Krasnoyarsk, 2000. - P. 246-247.
4. Habilov N.L, Mun T.O, Usmonov F.K Densitometric study of the degree of osteointegration of the dental implant "Implant.uz" in experimental conditions // European Science review. Austria, Vena, 2016. -Vol. 3-4. P. 244-247

5. Habilov N.L, Mun T.O, Usmonov F.K, Milusheva R.Yu., Holmuminov A.A The problem of creating a bioactive layer of the intraosseous dental omplants in Uzbekistan // European Science review. Austria, Vena, 2016. -Vol. 3-4. P. 247-251

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EVALUATION OF THE EFFECTIVENESS OF TRANSHEPATIC EMBOLIZATION OF INFLOWS OF VARICOSE-DILATED ESOPHAGUS AND STOMACH VEINS IN PATIENTS WITH PORTAL HYPERTENSION

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ABSTRACT

Background. Liver cirrhosis is one of the most common diseases in the world. It is so hazardous disease with its complications such as hepatic insufficiency, ascites, bleeding from varicose veins, hypersplenism and so on. TIPS is an effective method in reducing portal pressure and preventing repeated bleeding, but the main problem with TIPS was that liver failure and encephalopathy could progress to 29% in the postoperative period.

Methods. The study group included 46 patients for the period 1998-2015. The average age of the patients was 39.4 ± 17.7 years, the ratio of men and women was 37 to 9. In the distribution of patients by severity of hepatic dysfunction according to the Child-Pugh gradient, in 15 (32.6%) cases the class A (5-6 Points), 19 (41.3%) to class B (7-9 points) and 12 (26.1%) to class C (10-15 points). Thus, in 67.4% of patients, the initial PH was detected in the sub- and

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decompensation stage. In all cases, portal hypertension had the character of an intrahepatic block, i.e. LC, the cause of which in 93.5% of cases was viral hepatitis and 6.5% of cases - association of alcoholic and viral hepatitis.

Results. Analysis of the results of treatment and clinical and biochemical parameters allowed to establish that in the near postoperative period the peripheral blood parameters significantly increase. Thus, the concentration of hemoglobin significantly increased from 69.7 ± 2.03 to 91.8 ± 1.84 g/L ($p < 0.05$), the hematocrit increased from 20.7 ± 1.24 to 23.1 ± 1.88 % ($P < 0.05$), the number of erythrocytes increased from 2.32 ± 0.17 to $2.39 \pm 0.15 \cdot 10^{12} / l$ ($p < 0.05$), platelets from 122.7 ± 12.24 to $167,5 \pm 11.38 \times 10^9 / L$ ($p < 0.05$).

Conclusion. As the annotated material shows, with transhepatic interventions in the group of patients with grade A. The lethality is 6.6% and class B is 15.7%. This suggests that transhepatic endovascular interventions can be a method of choosing prevention and treatment of bleeding from the VDES in patients with cirrhosis of the liver and LI class A and B. The complex application of ERS allows a slight reduction in portal pressure and thereby compensate for the rise in portal pressure after PEGV, and significantly improve the indicators of hepatic insufficiency and hypersplenism in the postoperative period.

INTRODUCTION

Cirrhosis of the liver is one of the most common diseases in Uzbekistan. Complications are observed in patients with

decompensated liver cirrhosis, including hepatic insufficiency, ascites, bleeding from varicose veins of the esophagus and hypersplenism are the cause of

disability and death [1-3]. Among them, especially fatal is the development of portal hypertension (PG) and bleeding from varicose-dilated esophagus and stomach veins (VDES) [2, 3]. Immediate mortality from continuing bleeding is about 4-8% [2, 4, 5], and 20% of patients with acute bleeding die within 6 weeks from the development of other complications [2, 4, 8]. Even bleeding from varicose VDES is stopped, more than in 60% of patients it recurs [6, 7], and the mortality from rebleeding in patients with decompensated liver cirrhosis reaches 78% [5].

To date, there are various methods of treating PG including surgical treatment, endovascular interventions and endoscopic treatment. Many methods of surgical treatment have been developed. These operations are

very effective in reducing pressure in the portal vein and preventing rebleeding, but have their limitations: mainly their invasiveness and postoperative complications, including portal vein thrombosis, gastric mucosal trauma and gastrostasis, encephalopathy and progression of liver failure [8-10]. This connection of operative interventions for PG is not a method of choosing the first line for patients with bleeding from the VDES, and for patients with PI grade B and C on Child-Pugh is contraindicated.

Minimally invasive and invasive methods that have been recommended for the treatment of VDES bleeding include endoscopic Sclerotherapy (ES) [11-13], ligation (EL) [11, 12], endovascular transjugular intrahepatic portosystemic shunting (TIPS) [14-16],

endovascular percutaneous-cross-embolization of gastro-esophageal varicosities (PEGV) [17, 18] and other combined methods [19-22]. Endoscopic interventions are an effective method in the prevention and treatment of bleeding from VDES, but these methods of treatment are not a method of decompressing portal hypertension and their implementation is difficult in varicose veins of the esophagus with transition to the stomach or isolated lesions, a high rate of recurrence of bleeding in these cases is still dictates the search for other treatment options for patients in this category [12].

TIPS is an effective method in reducing portal pressure and preventing repeated bleeding, but the main problem with TIPS was that liver failure and encephalopathy could progress to 29% in the postoperative period

[14]. Therefore, TIPS is not recommended as a first-choice method to prevent rebleeding, but rather it is used in relapsing bleeding after other minimally invasive methods [12, 15]. Endovascular reduction of splenic blood flow (ERSBF) is an effective method in patients with hypersplenism, and the method allows improving liver function and slightly reducing portal hypertension [23]. PEGV allows successfully stop bleeding in 90% of patients with PH [18, 24, 25]. Nevertheless, after PEGV, there is a slight increase in portal pressure due to embolization of portocaval collaterals by 50-100 mmHg and in 35-65% there is a recurrent bleeding in the long-term period of patients after PEGV [17, 18, 24]. However, the combined use of ERSBF and PEGV is still effective, remains unknown. In this study, we studied

the efficacy of the combined use of ERSBF and PEGV in patients with liver cirrhosis (LC) as methods of prevention and treatment of bleeding. Thus, the purpose of our study was to evaluate the effectiveness of the integrated application of the PEGV and ESRBF.

MATERIAL AND METHODS OF INVESTIGATION

This clinical study was conducted at the clinical base of the Department of Faculty and Hospital Surgery-No.1 at the Tashkent Medical Academy. The main criterion for the selection of patients was the presence of cirrhosis with bleeding from the VDES or anamnestic bleeding. The degree of VDES was evaluated according to the classification of N. Soehendra, K. Binmoeller (1997) (three graded classification of the differentiated

approach to this pathology in the esophagus and stomach). The severity of hepatic dysfunction was assessed by the criteria of Child-Pugh.

Patients with severe hepatorenal syndrome, portal vein thrombosis, expressed encephalopathy and bilirubinemia above 50 $\mu\text{mol/L}$ were not included in the study group. In addition, the presence of volumetric formations in the right lobe of the liver along the prospective puncture, intestinal interposition, was a contraindication for performing transhepatic interventions. In the case of severe ascites, non-responsive diuretic therapy, the patient initially underwent laparocentesis, followed by endovascular intervention. The main criteria for assessing the effectiveness of endovascular

intervention were the effectiveness of stopping bleeding, the ability to prevent recurrence of bleeding in the near and distant period, reducing complications and lethality.

The study group included 46 patients for the period 1998-2015. The average age of the patients was 39.4 ± 17.7 years, the ratio of men and women was 37 to 9. In the distribution of patients by severity of hepatic dysfunction according to the Child-Pugh gradient, in 15 (32.6%) cases the class A (5-6 Points), 19 (41.3%) to class B (7-9 points) and 12 (26.1%) to class C (10-15 points). Thus, in 67.4% of patients, the initial PH was detected

in the sub- and decompensation stage. In all cases, portal hypertension had the character of an intrahepatic block, i.e. LC, the cause of which in 93.5% of cases was viral hepatitis and 6.5% of cases - association of alcoholic and viral hepatitis.

Along with the generally accepted clinical and laboratory studies, esophagogastrobrosopy was used to clarify the source of bleeding. Four (8.7%) patients had VPV of the esophagus II degree, 27 (58.7%) had III degree, and 15 (32.6%) had an esophagic varicose veins with a change to the cardiac and stomach (Table 1).

Table 1.

**The distribution of patients according to the degree of PN (Child-Pugh)
 and the degree of VDES**
(N. Soehendra, K. Binmoeller)

Liver insufficiency	Number	%
<i>Class A</i>	15	32,6
<i>Class B</i>	19	41,3
<i>Class C</i>	12	26,1
VDES degree		
<i>II degree</i>	4	8,7
<i>III degree</i>	27	58,7
<i>GOV-1, 2 type</i>	15	32,6

Active bleeding at the time of endoscopy was detected in 17 (36.9%) patients. After detecting the source of bleeding in all cases, the bleeding from the VDES is stopped by the installation of a probe-obturator Sengsteichen-Blakemore. This allowed to restore the volume of circulating blood, hemodynamic and laboratory indicators in the shortest possible time for the purpose of preoperative preparation.

To prevent PN, patients were prescribed L-Ornicyn aspartate (Hepa-Merz), Ademetionite

(Heptral), glutamic acid and oral antibacterial drugs (tetracycline, metronidazole), and regular purgative enemas.

The technique of endovascular PEGV

Diagnostic and therapeutic endovascular interventions were performed under the conditions of X-ray surgery equipped with angiographic devices "Multistar TOP +" and "Triplex Angiomatic" from Siemens, equipped with appropriate recording devices. The advantage was given to studies in the digital subtraction mode with

computer image processing and the necessary measurements. The pressure was recorded on the Mingograph-62 apparatus of the Elema Company. At the same time, a set of necessary special tools and devices, means for embolizing vessels, filling material were used.

Angiographic diagnosis of impaired hepatic and hepatic circulation in the PG along with studies of the portal vein and its tributaries necessarily included the performance of celiacography, mesenteric portography, lower cava and hepatography according to standard procedures.

Puncture of the portal vein branches was performed under local anesthesia with 0.5% solution of Novocain with respiratory arrest from 7-8-9 intercostal space along the middle axillary line to the right, deviating from it dorsally or ventrally depending on the

obtained data on liver topography and landmarks individually in each specific The case. In most cases puncture of the portal vein was possible after 1-3 attempts, but in individual cases up to 8-10 punctures were performed.

For sequential embolization of VDESVA using Lunderquist and Vang (277), a sequential selective catheterization of PLHIV and KZHV followed by phlebography was carried out. Then, occlusion of each of these veins was performed by introducing metal spirals, Teflon velor, a hemostatic sponge in combination with sclerosing agents such as 96% ethyl alcohol, 3% thrombovar as emboli.



Fig. 1. a- Percutaneous transhepatic portography before embolization of the left gastric vein; B-portography after acute embolization of the left gastric vein.

Special difficulties arose in patients with a pronounced conglomerate of varicose veins of the stomach, which had inflows not only from the left gastric vein, but also from a variety of short gastric veins. This connection in 11 cases after embolization of the influx of VDESV catheter in the portal vein is left both to control the development of new inflows and intra-portal

administration of drugs. In 7 cases in the control portography additional ways of inflow of the VDESV through the embolized collectors were revealed, in 5 cases their reembolization was carried out. The nature of performed endovascular interventions is presented in Table -2.

Quality control of embolization was carried out by repeated portography and measurement of pressure in the portal vein, which, with effective blocking of gastroesophageal shunts, as a rule, increased by 80-

110 mmHg In this connection, for the purpose of reducing the arterial influx into the portal channel, embolization of the splenic artery and / or the left gastric artery was performed by known and improved techniques. At the same time, for ERSBF, the catheter was made and superselectively installed into the spleen artery as close as possible to the spleen gates; and distal to the branch of the pancreatic branches after

performing the celiacography. For the embolization, metal conical spirals were used, which significantly reduces the risk of spleen infarction. In 3 (2.3%) patients due to anatomical features of the vessels of the celiac trunk, i.e. The passage of the celiac trunk at an acute angle from the aorta hampering the introduction of the catheter into the necessary basin, embolization of the splenic artery failed.

Table 2
Types and number of endovascular interventions

Characterization of intervention	<i>number</i>	%
Acute embolization of the left ventricular vein	1	2,2
Acute embolization of the left gastric vein, short gastric veins	3	6,5
Acute embolization of the left gastric vein, short gastric veins and splenic artery	37	80,4
Acute embolization of the left ventricular vein and splenic artery	5	10,9
Total	46	100

RESULTS

Despite hemorrhage and a decrease in central hemodynamics, portal pressure remained rather high, on average 411.7 ± 18.5 mmHg. Obliteration of varicose

veins of the esophagus was accompanied in most cases by an increase in portal pressure by 80-110 mm. (79.2 ± 6.6 mmHg) from the initial value, which indicates effective blockage of

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gastroesophageal shunts. Embolization of the splenic artery and left gastric artery resulted in a gradual decrease in portal pressure on average to $71 \pm 10,8$ mmHg, which significantly reduced the risk of rebleeding.

Analysis of the results of treatment and clinical and biochemical parameters allowed to establish that in the near postoperative period the peripheral blood parameters significantly increase. Thus, the concentration of hemoglobin significantly increased from 69.7 ± 2.03 to 91.8 ± 1.84 g/L ($p < 0.05$), the hematocrit increased from 20.7 ± 1.24 to 23.1 ± 1.88 % ($P < 0.05$), the number of erythrocytes increased from 2.32 ± 0.17 to $2.39 \pm 0.15 \cdot 10^{12} / l$ ($p < 0.05$), platelets from 122.7 ± 12.24 to $167,5 \pm 11.38 \times 10^9 / L$ ($p < 0.05$).

Despite the relatively low traumatism of interventions, the

postembolization period in the group of patients with liver insufficiency grade C was difficult. In the first few days, patients noted pulling, dull pain in the right hypochondrium and epigastric region. The rise in body temperature to $38-38.5^{\circ}\text{C}$ was observed in the early stages after the operation in 19 patients. Drawing dull pain in the right hypochondrium was noted in all patients who were stopped by the introduction of non-steroidal analgesics.

In the group of patients to whom the interventions were performed in full, the most severe complications were bleeding into the abdominal cavity and thrombosis of the portal vein and mesenteric vessels. As follows from Table-3, bleeding occurred in 2 cases (4.3%). Blood flow into the abdominal cavity occurred through

a puncture hole in the liver, the factor of which was increased bleeding caused by deep disorders of the blood coagulation system. Among other reasons, it should be indicated the presence in patients significantly reduced in size of the compacted liver and high portal pressure. Especially dangerous is the combination of these factors. Despite the carefully completed filling of the puncture canal using polymerizable mixtures, it was not possible to avoid bleeding.

Patients with intra-abdominal hemorrhage underwent emergency surgical interventions according to vital indications. In the postoperative period, hepatic-renal failure increased, cardiovascular system and other vital systems of the body progressed, which caused the death of 2 patients (4.3%).

The amount of ascites fluid decreased somewhat in 8 patients,

in 4 patients there was no specific dynamics of this index. In 6 cases, progressive accumulation of ascites was noted despite the ongoing diuretic therapy, which was accompanied by respiratory failure and required laparocentesis. In the postoperative period, the most common complication was hydrothorax, which was detected in 11 (8.9%) patients and was associated with the admission of ascitic fluid into the pleural cavity through peritoneopleural fistula formed because of percutaneous transhepatic puncture of the portal vein. In 9 patients, hydrothorax was accompanied by respiratory failure, which aggravated the condition of patients, which required drainage of the pleural fluid. Complications after transhepatic embolization of inflows of varicose veins of the esophagus and stomach are presented in Table 3.

Table 3

Types of complications of percutaneous transhepatic endovascular interventions

Types of complications	Complication		
	Class A	Class B	Class C
Intraperitoneal bleeding	-	1 (2,1%)	1 (2,1%)
Hydrothorax	-	4 (8,6%)	7 (15,2%)
Inflammation of the spleen	2 (4,3%)	5 (10,8%)	-
Left sided pleuritis	1 (2,1%)	3 (6,5%)	-
Leakage of ascites with prolonged catheterization of the portal vein	-	3 (6,5%)	2(4,3%)
Dislocation of catheter	-	3 (6,5%)	-
Recurrent bleeding	1 (2,1%)	2 (4,3%)	1 (2,1%)
Mortality	1 (6,6%)	3 (15,7%)	5 (41,6%)

Complications caused by prolonged catheter placement in the portal vein were noted in 5 cases (10.8%): leakage of a small amount of blood during the catheter - in 2 patients (4.3%) and dislocation of the catheter into the liver parenchyma with an inflection between the liver and thoracic Wall - in 3 cases (6.5%). These complications have been successfully eliminated by the use of intraduizers and co-axial

insertion of the catheter into the portal vein. To prevent such complications, the catheter was fixed to the chest wall in free movement mode. In 5 patients with severe ascites, subcutaneous accumulation and leakage of ascitic fluid around the catheter was noted. The accumulation of ascitic fluid was local, did not spread to nearby areas and did not threaten the patient's life. When leakage of

ascitic fluid around the catheter, U-shaped seams were applied.

Estimating results of treatment in patients after PEGV it should be mentioned that 11 patients (23.9%) died from 46 patients at the hospital stage. The cause of death in 5 patients was progressive liver failure, in one case - multi-organ failure in extremely decompensated patients, in 3 cases of recurrence of bleeding and in 2 cases of intra-abdominal hemorrhage.

DISCUSSION

One of the main complications of portal hypertension is bleeding from the VDES. It is estimated that 30-40% of patients with cirrhosis in the stadia of compensation and subcompensation and 60% in the stage of decompensation are expected to be diagnosed with VDES [7, 18, 22]. The probability

of bleeding is directly related to the size of varicose veins, as well as their localization. The risk of bleeding from VRVH in patients with unexpressed varicose is about 7% within 2 years, and 30% in patients with grade 3 varicose. Endoscopic, endovascular and surgical methods are used to treat bleeding from the VDES [26, 27]. The effectiveness of endovascular interventions is somewhat higher than endoscopic, but its use is not always appropriate in view of the possible development of complications and technical complexity [19, 21].

It has been shown that PEGV can improve clinical outcomes in patients with bleeding from varicose veins of the esophagus and stop bleeding, but in the hollow vein, the PEGV cannot effectively reduce portal pressure. In connection with this, PEGV with

bleeding from VDESv combined with endovascular interventions should be supplemented with ERSBF to increase blood flow to the liver and reduce blood flow to the portal vein, reduce portal pressure, and, therefore, reduce the risk of recurrence of bleeding. Our results indicate that this combination was successful [23, 24].

Analysis of the results of endovascular methods of hemostasis in patients of this category shows that the following problems arise in the course of treatment: the complexity of correction of functional disorders before performing interventions, exacerbation of hepatic insufficiency, a severe postoperative period associated with the development of complications and a high frequency of bleeding recurrences in the postembolization period [25]. At

the same time, the postoperative period was favorable in the group of patients with grade A and B PN in comparison with the group of patients of class C. Patients with A class A had no complications such as hydrothorax and accruing ascites, whereas in the group of patients of class B and C 8.6% and 15.2% were observed. In the group of patients with ascitomimeli, there were technical difficulties with puncture and catheterization of the portal vein [29].

Lethality significantly depended on the initial functional state of the liver. Thus, according to the Child-Pugh classification, among the 15 patients classified as Class A (5-6 points), lethal cases were 1 (6.6%), while out of 19 patients of Class B (7-9 points), 5 (26.3%) died, and among the 12 patients, class C (10-15 points), there were 5 deaths (41.6%). The

high lethality in the group of patients with PI of grade C is due to progressive hepatic insufficiency, as well as to the change in the anatomical location of the vascular elements of the liver in cirrhosis, portal hypertension and ascites [8, 28].

CONCLUSION

The main cause of unsatisfactory results and high mortality in the use of percutaneous transhepatic methods of endovascular treatment of VDESv with cirrhosis and portal hypertension is pronounced ascites and the initial severity of hepatic insufficiency of class C. As the annotated material shows, with

transhepatic interventions in the group of patients with grade A. The lethality is 6.6% and class B is 15.7%. This suggests that transhepatic endovascular interventions can be a method of choosing prevention and treatment of bleeding from the VDESv in patients with cirrhosis of the liver and LI class A and B. The complex application of ERS allows a slight reduction in portal pressure and thereby compensate for the rise in portal pressure after PEGV, and significantly improve the indicators of hepatic insufficiency and hypersplenism in the postoperative period.

REFERENCES

1. D'Amico G, de Franchis R. Upper digestive bleeding in cirrhosis. Post-therapeutic outcome and prognostic indicators. Hepatology. 2003;3:599–612. [[PubMed](#)]
2. Karimov ShI, Borovskiĭ SP, Rakhmanov SU, Atakhanov DA., Endovascular embolization of the hepatolienal vessels in the treatment of portal hypertension. Angiol Sosud Khir. 2003;9(2):40-6. English, Russian.
3. D'Amico G, Garcia-Tsao G, Pagliaro L. Natural history and prognostic indicators of survival in cirrhosis: a systematic review of 118 studies. J Hepatol. 2006;1:217–231. [[PubMed](#)]
4. D'Amico G, Luca A. Natural history. Clinical-haemodynamic correlations. Prediction of the risk of bleeding. Baillieres Clin Gastroenterol. 1997;11:243–256. [[PubMed](#)]
5. de Franchis R, Primignani M. Natural history of portal hypertension in patients with cirrhosis. Clin Liver Dis. 2001;5:645–663. [[PubMed](#)]
6. Koconis KG, Singh H, Soares G. Partial Splenic Embolization in the Treatment of Patients with Portal Hypertension: A Review of the English Language Literature. J Vasc Interv Radiol. 2007;18:463–481. [[PubMed](#)]
7. de Franchis R. Evolving consensus in portal hypertension report of the Baveno IV consensus workshop on methodology of diagnosis and therapy in portal hypertension. J Hepatol. 2005;43:167–176. [[PubMed](#)]

8. Bosch J, Berzigotti A, Garcia-Pagan JC, Abraldes JG. The management of portal hypertension: rational basis, available treatments and future options. *J Hepatol.* 2008;48:68–92. [[PubMed](#)]
9. Burroughs AK, Vangeli M. Transjugular intrahepatic portosystemic shunt versus endoscopic therapy: randomized trials for secondary prophylaxis of variceal bleeding: an updated metaanalysis. *Scand J Gastroenterol.* 2002;37:249–252. [[PubMed](#)]
10. Yoshida H, Mamada Y, Taniai N, Tajiri T. New methods for the management of esophageal varices. *World J Gastroenterol.* 2007;13:1641–1645. [[PMC free article](#)] [[PubMed](#)]
11. Nazyrov FG, Deviatov AV, Babadzhanov AKh, Sultanov SA. Specific development and course of portal hypertension complication in patients with hepatic cirrhosis of HBV and HCV etiology. *Vestn Khir Im I I Grek.* 2011; 170 (1) :22-9. Russian.
12. Tomikawa M, Hashizume M, Okita K, Kitano S, Ohta M, Higashi H, Akahoshi T. Endoscopic injection sclerotherapy in the management of 2105 patients with esophageal varices. *Surgery.* 2002;131:S171–5. [[PubMed](#)]
13. Villanueva C, Colomo A, Aracil C, Guarner C. Current endoscopic therapy of variceal bleeding. *Best Pract Res Clin Gastroenterol.* 2008;22:261–278. [[PubMed](#)]
14. Krige JE, Kotze UK, Bornman PC, Shaw JM, Klipin M. Variceal recurrence, rebleeding, and survival after endoscopic injection sclerotherapy in 287 alcoholic cirrhotic patients with bleeding esophageal varices. *Ann Surg.* 2006;244:764–770. [[PMC free article](#)] [[PubMed](#)]

15. Ohmoto K, Yoshioka N, Tomiyama Y, Shibata N, Takesue M, Yoshida K, Kuboki M, Yamamoto S. Improved prognosis of cirrhosis patients with esophageal varices and thrombocytopenia treated by endoscopic variceal ligation plus partial splenic embolization. *Dig Dis Sci.* 2006;51:352–358. [[PubMed](#)]
16. Tesdal IK, Filser T, Weiss C, Holm E, Dueber C, Jaschke W. Transjugular intrahepatic portosystemic shunts: adjunctive embolotherapy of gastroesophageal collateral vessels in the prevention of variceal rebleeding. *Radiology.* 2005;236:360–367. [[PubMed](#)]
17. De Franchis R, editor. Proceedings of the fourth Baveno international consensus workshop on methodology of diagnosis and treatment. Oxford UK: Blackwell; 2006. Portal Hypertension IV; pp. 262–284.
18. Sauer P, Theilmann L, Stremmel W, Benz C, Richter GM, Stiehl A. Transjugular intrahepatic portosystemic stent shunt versus sclerotherapy plus propranolol for variceal rebleeding. *Gastroenterology.* 1997;113:1623–1631. [[PubMed](#)]
19. Rosch J, Keller FS. Transjugular intrahepatic portosystemic shunt: present status, comparison with endoscopic therapy and shunt surgery, and future prospectives. *World J Surg.* 2001;25:337–345. [[PubMed](#)]
20. Zhang CQ, Liu FL, Liang B, Sun ZQ, Xu HW, Xu L, Feng K, Liu ZC. A Modified Percutaneous Transhepatic Variceal Embolization with 2-Octyl Cyanoacrylate Versus Endoscopic Ligation in Esophageal Variceal Bleeding Management: Randomized Controlled Trial. *Dig Dis Sci.* 2008;53:2258–2267. [[PubMed](#)]

21. Lin N, Liu B, Xu RY, Fang HP, Deng MH. Splenectomy with endoscopic variceal ligation is superior to splenectomy with pericardial devascularization in treatment of portal hypertension. *World J Gastroenterol.* 2006;12:7375–7379. [[PMC free article](#)] [[PubMed](#)]
22. Borgonovo G, Costantini M, Grange D, Vons C, Smadja C, Franco D. Comparison of a modified Sugiura procedure with portal systemic shunt for prevention of recurrent variceal bleeding in cirrhosis. *Surgery.* 1996;119:214–221. [[PubMed](#)]
23. Taniai N, Onda M, Tajiri T, Yoshida H, Mamada Y. Combined endoscopic and radiologic intervention to treat esophageal varices. *Hepatogastroenterology.* 2002;49:984–988. [[PubMed](#)]
24. Huang LY, Cui J, Wu CR, Liu YX. Embolization combined with endoscopic variceal ligation for the treatment of esophagogastric variceal bleeding in patients with cirrhosis. *Chin Med J.* 2007;120:36–40. [[PubMed](#)]
25. Smith-Laing G, Scott J, Long RG, Dick R, Sherlock S. Role of percutaneous transhepatic obliteration of varices in the management of hemorrhage from gastroesophageal varices. *Gastroenterology.* 1981;80:1031–1036. [[PubMed](#)]
26. de Franchis R, Dell’Era A, Primignani M. Diagnosis and monitoring of portal hypertension. *Dig Liver Dis.* 2008; 40: 312–317. [[PubMed](#)]
27. Benner KG, Keeffe EB, Keller FS, Rosch J. Clinical outcome after percutaneous transhepatic obliteration of esophageal varices. *Gastroenterology.* 1983;85:146–153. [[PubMed](#)]

28. Yang Z, Qiu F. Pericardial devascularization with splenectomy for the treatment of portal hypertension. Zhonghua Wai Ke Za Zhi. 2000; 38:645–648. [[PubMed](#)]

29. Escorsell A, Bañares R, García-Pagán JC, Gilabert R, Moitinho E, Piqueras B, Bru C, Echenagusia A, Granados A, Bosch J. TIPS versus drug therapy in preventing variceal rebleeding in advanced cirrhosis: a randomized controlled trial. Hepatology. 2002; 35:385–392. [[PubMed](#)]

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**PROBLEMS AND PROSPECTS OF DEVELOPMENT OF SPORTS
MEDICINE**

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ABSTRACT

In this article, authors described and analysed problems and prospects of sports medicine, which is related to development of healthcare in sport. Sports practices began to be gradually divided, creating contradictions between health functions and the disastrous consequences of sport, which turns into a highly profitable business. The development of sport of higher achievements, which serves to strengthen the prestige of the country, on the basis of the theory of the notorious "pyramid" about the positive impact of "big" sports on the mass character of the physical culture movement remains a priority. The theory received its name "pyramid" because of the idea of the sports movement in the form of mass sports practice at the base and mastery of elite athletes at the top. A better understanding of sports phenotypes, associated genes and their interactions with environmental factors will ultimately help sports physicians and trainers identify individuals with the genetic potential of elite athletes and with a propensity for trauma and illness. Therefore, each athlete must have a genetic passport, which should

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indicate the variants of the genes necessary to achieve high sports results in the chosen sport, the expression levels of these genes at rest and under stress, as well as the genes of the risk of occupational pathologies.

INTRODUCTION

In its development, the focus of sports science was the patterns of constructing human movements and the problem of optimizing motor activity, since this was due to the request for scientific and methodological support for the process of physical education. Later, sports medicine began to form such directions as sports medicine, biomechanics, biochemistry, sports anthropology, sports psychology, etc., connected with the need for scientific and methodological support of the process of sports training of national teams for participation in international competitions [1]. In each direction, the research was conducted in accordance with the scientists' own vision within the paradigms of their science. In the

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future, the problem of integrating scientific knowledge on a sectoral basis within the framework of sports science is becoming more and more relevant, but its solution has faced serious methodological problems affecting the integration of natural, social and humanitarian knowledge [2].

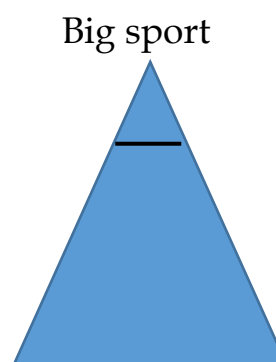
In the sports movement in the last half century, there have been significant changes. Sports practices began to be gradually divided, creating contradictions between health functions and the disastrous consequences of sport, which turns into a highly profitable business [3, 4]. The fact is that in the sport of higher achievements, aspects of humanization, health and competitive functions are moving more and more to the background, letting forward political and commercial interests. Rivalry in sports is becoming more aggressive and even fanatical, when success

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can be achieved at any cost, and the prize in the competition is stimulated at times by a solid monetary reward [5, 6, 7].

Modern competitions are turning into a powerful show industry, into the sphere of the world economy, bringing solid profits, and act as an important factor in the domestic and foreign policy of the state. Naturally, in such conditions, substantial financial support is required for the preparation of every athlete of the World Cup or the Olympic Games, and the conduct of the competitions themselves is very expensive, so the economically most developed countries have the advantage in this respect [8, 9]. In the sport of higher achievements, there were some negative trends in the form of: turning into a product that can be sold at a bargain price, coaches, athletes and even entire teams; Facts of corruption among sports officials, chauvinism and nationalism, hooliganism in stadiums, politicization of sports fan-movement; Scandals with doping and mortality on sports grounds [10, 11, 12].

In many countries, and in particular in Russia, according to O.A. Milstein [13], the development of sport of higher achievements, which serves to strengthen the prestige of the country, on the basis of the theory of the notorious "pyramid" about the positive impact of "big" sports on the mass character of the physical culture movement remains a priority. The theory received its name "pyramid" because of the idea of the sports movement in the form of mass sports practice at the base and mastery of elite athletes at the top (Fig. 1). At the same time, the wider the base of the pyramid is from the mass practice of sport, which serves as a source for replenishing the ranks of those athletes who storm the heights in sports, the higher may be its peak, due to the social atmosphere created for sporting achievements.



Mass Sports Figure 1.
"Pyramid" of "big" sports

At the same time, L.P. Matveev [1, p.44] argued that "Throughout the entire historical period that began in the postwar years with the forced exit of Soviet athletes to the international arena, and until the last years there was in fact an obvious tendency toward sport of higher achievements with a detriment to the development of a mass Sports ... ». In addition, according to R. Acher, "The society is actively inspired by the myth that one thousandth of a second, reduced from the world record, seriously contributes to the progress of civilization" [14, p.13].

This discrepancy of opinions was formed as a result of the split and the appearance of differences in goals and objectives, as well as methodological and organizational approaches to the sports training of

elite athletes and physical education and recreational activities of other people. After all, the former become professionals by their very nature, training twice a day and undergoing super-stresses, using a variety of means to restore their strength, etc., and such "experience inspiring sporting achievements" scarcely can be acceptable for recreational activities , So people only watch sports spectacles, but do not increase their own physical activity [15].

However, sports orientation has always been relevant for mass children's and youth sports, from which perspective prospective athletes are selected on the basis of the initial level of development of physical qualities and their dynamics.

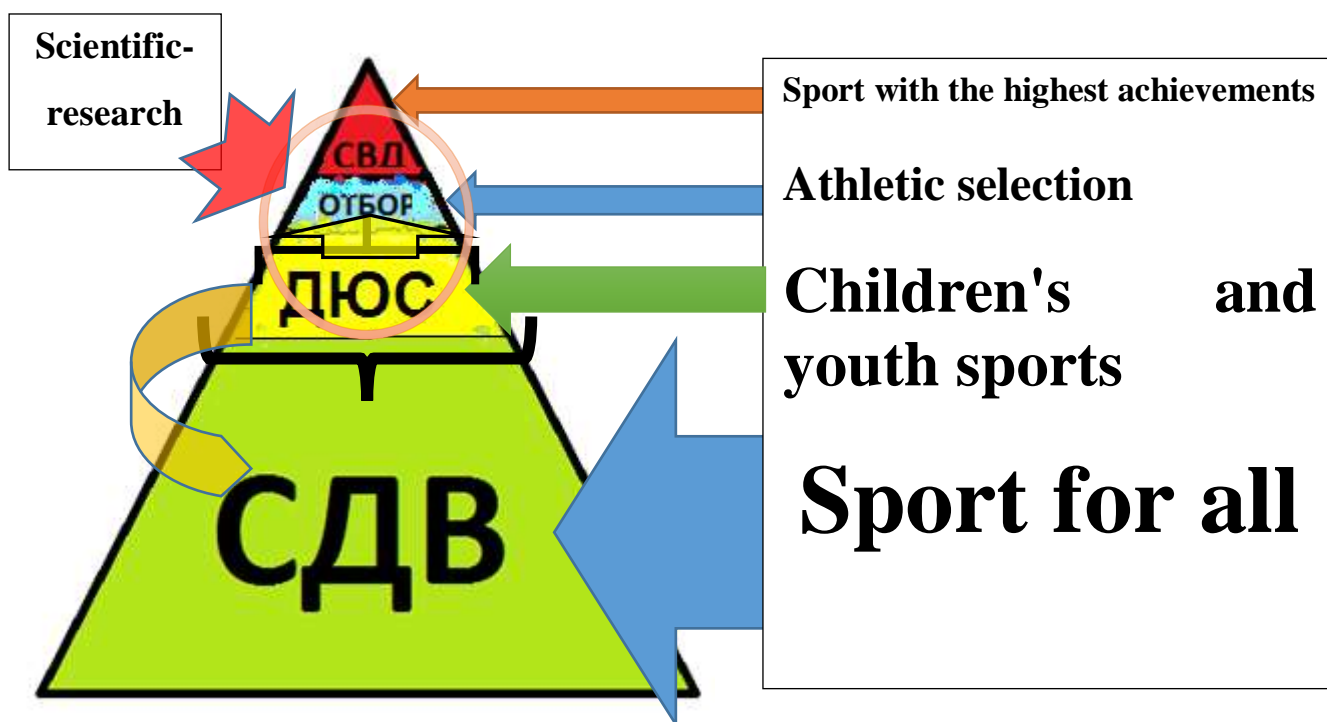


Figure 2. Picture "Pyramid" of sports and objects of scientific research.

At the same time, throughout the world, the introduction to the practice of sport by a wide range of people is gaining momentum in the form of a social phenomenon called sport for all, which includes all kinds of physical exercises aimed at improving health, improving physical condition, self-expression. Based on the personal interests of citizens, and at the same time

serves as an alternative to highly standardized and commercialized sports of higher achievements [16]. In this respect, sport for all acquires an independent social value, but not so much as the foundation of the "pyramid", but rather as an opportunity to improve the "quality of life" of millions of residents of different ages and levels of training.

Recently, new methodological principles of mass physical education have been laid down due to the development of the fitness movement based on the production of sports simulators [4, 9]. His ideology was the solution of each specific problem of the individual (weight reduction, increase of efficiency, strengthening of the muscular framework, increased stress resistance, correction of physical abnormalities, etc.) through specific selection of funds within targeted individual programs. In general, the idea of solving problems of physical improvement has become prevalent in the fitness movement. In its organization, the network principle was implemented, the introduction of a wide arsenal of tools and health technologies: from traditional and advanced European techniques to oriental

psychosomatic practices (yoga, qigong, Zen Buddhism, etc.). Unfortunately, the process of updating the content of physical education through the fitness movement occurs mainly empirically or spontaneously and is not accompanied by any serious scientific research.

In such conditions, the objects of scientific research in sports are primarily the problems of sport of higher achievements and subordinate sports selection, as well as the problems of children's and youth sports, which serves as the basis for the selection of prospective athletes. In this case, the basis of the sport pyramid (in terms of sports science) is actually children's and youth sports, from which only a few percent of talented athletes feed the top of the pyramid – the sport of higher achievements. Moreover, the rest –

fall into the lower part of the pyramid, not studied by science, Sport for all (pic.2).

The reason for this situation naturally lies in the flow of financial flows, in connection with which the modern sports science has come face to face with a number of problems that require a rethinking of their scientific and methodological foundations. This entailed a review of the methodological arsenal of sports training with a change in the content of sports activities and led to the formation of new approaches to the organization and management of sports.

Conceptual diagrams describing the processes of sports training, developed at the previous stage of development of sports science, ceased to correspond to reality [17]. The formation of commodity forms from sports

practice ultimately led to the subordination of health interests to the interests of success and income. The competition following them contributed to a sharp increase in physical exertion, which has reached the limits of human capacity to date [18].

Sports medicine began to face the consequences of the maximum and even prohibitive loads experienced by athletes in the process of preparation and performance in competitions, as well as the reception of new types of doping, which is a reflection of the achievement of their maximum levels in some sports, which traditional methods of training cannot overcome [14]. The increase in physical loads that reach the limits of human capabilities, in turn, naturally leads to a violation of health, which often becomes a payment for victory. In this case,

some athletes, according to official documents, can identify diseases for which they are entitled to release from excessive physical activity in their daily activities. In addition, it is hard to say right now - it's a reality or a trick to justify taking special drugs that are considered doping [11].

As a result of the higher achievements described above in modern sports, the state of overtraining, which manifests itself in a decrease in working capacity, rapid fatigue, headaches, irritability, sleep disturbance, asthenia, changes in vascular tone and arterial pressure, is gaining momentum and becoming quite widespread [19].

The most often overtraining is revealed in sportsmen engaged in such sports as swimming, cycling, triathlon, rowing, cross-country skiing, biathlon, etc. [20]. In

general, it is typical for 7-20% of sportsmen of the highest qualification at any time. According to some reports, it is in the sports associated with the manifestation of endurance, the condition of overtraining during their sports career is experienced by at least 70% of high-class athletes [22].

The phenomena of overtraining, manifested by the inability to transfer specific sports loads due to atypical adaptation due to imbalance between vegetative processes and the degree of stress factors influence, are fraught with the development of depression, increased susceptibility to infections and sports injuries [23]. The probability of overtraining increases with the intensification of the training process and the growth of skills, with excessive loads in adolescence, irrationally chosen and disorderly, not corresponding

to the direction of the training process of action, [24] competitive and training activities in the conditions of heat and high mountains with irrational planning [25]. As well as long-distance flights to places of training and competitions, leading to desynchronization of circadian rhythms [26, 27].

At present, the creation of scientifically based training system and optimal organization of competition processes in the sport of higher achievements becomes impossible without understanding the patterns of biological rhythms. Since their structure and dynamics quite clearly reflect the current functional state of the organism and the individual typological features of regulatory processes at various stages of its adaptation to influencing factors. Moreover, this becomes an important problem in

cases of transmedian flights to ensure a high level of efficiency and maintain the functional readiness of athletes at international competitions of the world and Olympic level [26]. The restructuring of biorhythms during long trans-temporal flights, causing a rapid and sharp shift of all phases of geophysical and social synchronizers in relation to the phases of these rhythms of the organism, lead primarily to changes in the cardiovascular and autonomic systems, as systems responsible for adapting the organism to a large number of diverse factors [28].

Chronoadaptation symptom complex can manifest itself in varying degrees: from weakly affecting the functional state of the athlete's body to weak manifestations, to expressed ones, with the inhibition of physical and

mental performance up to the realization of pathogenetic mechanisms of damaging effects [29]. It has been revealed that adaptive reactions can differ markedly among different groups of athletes depending on gender [39, 31], age and level of athletic skill [32], geographic region of residence [33, 34] and time of the year [35, 36]. But without differences in the structure of rhythm in athletes with different levels of adaptive abilities on the basis of the index of functional changes [34, 37].

In conditions of natural and diagnostic loads, the informativeness of changes in biorhythms can increase, on the basis of the study of which it is possible not only to assess the current state of the organism, but also to anticipate its prospects, which in turn will allow for a long-

term forecast of the level of the sports form of athletes [38]. This may also be important in controlling the seasonal changes in the biological rhythms of the main physiological indices of the organism in representatives of different sports [35, 36], since they fully reflect the state of adaptive capabilities of the organism [39-42], Organization of the training process to ensure a sporting result.

The high demands placed on the quality of the training process in modern conditions make it necessary to increase the efficiency of the work of sports schools, where, in effect, the system of sports selection of trainees is being implemented.

A scientifically based forecast of sports achievements of highly qualified athletes is possible when taking into account numerous factors, both external (impact) and

internal (individual and personal characteristics) factors. However, the available indicators that are implemented in the selection and forecasting process do not allow in all cases to take into account the aspects of sport specialization, its multifactorial essence, and selection of criteria for breeding is usually limited to the limits of one scientific discipline, as a result of which random connections and relationships can be analyzed [43].

In addition to anatomical signs, the reactivity of organs and systems, the composition of muscle fibers, the typological features of the basic properties of the nervous system, the temperament, the frequency-amplitude EEG parameters, etc., can play an important role in achieving sport success. Accordingly, a number of studies, the success in sports achievements to a certain extent is

associated with the degree of correspondence of interests, inclinations and individual psychological characteristics of the individual to the chosen type of sport activity. At the same time, it turned out that such personality traits as aggressiveness, dominance, perseverance, motivation, self-confidence and extraversion are often associated with achieving sporting success.

As mentioned above, in the last two decades, sports medicine has been experiencing a stage of its rapid development, especially in such areas as the study of strength, endurance, sports injuries and psychology [44]. Conditions for the training of athletes, including physical education, nutrition and medicine, were subject to constant changes in the twentieth century under the influence of technological progress. In this connection, Fogel

[45] even proposed the terminology of "techno-physiological evolution" to describe anthropometric changes in the body of athletes.

The XXI century is characterized by a rapid accumulation of information, the development of computer technology, the expansion of the use of various kinds of electronic equipment and gadgets. At the same time, the widespread introduction of digital technologies in sports leads to an avalanche-like increase in the amount of information received in the process of training and competitive activity of athletes. However, while it remains heterogeneous and poorly structured, since traditional approaches to processing information under such conditions are ineffective. In this connection, the problem of developing new multiparametric approaches to the

analysis and interpretation of data arose [46]. At the same time, the development of a number of engineering areas has shown how effective it is to use mathematical methods and models to find optimal solutions. In this respect, in the field of sports, it is also possible to advance along the path of turning coaching art into engineering technology.

The modern level of development of computer technologies creates wide opportunities for using mathematical methods and information models based on them, within which it is possible to search for solutions for achieving high results in sports competitions. The method of mathematical modeling, considering the athlete's organism as a system, allows us to deepen our knowledge of the studied processes, to reveal a wide range of

system responses, on the basis of changing model parameters, to formulate specific quantitative hypotheses that can be tested in the experiment, predict and reveal fundamentally new classes of phenomena [47].

The ability to manipulate the parameters of the model in the course of the computational experiment allows us to find various modes of functioning of the human body, which, due to the complexity and high degree of non-linearity of biological systems, can often be predicted using verbal schemes.

Forecasting in sports covers many aspects, including forecasting the results of the competition [48, 49] or revealing sports talent [50, 51]. The first models have already been created, predicting the results in the sport, taking into account the seasonal statistics of each team [52].

It is also shown the possibility of identifying talented young hockey players from among boys aged 15-16 who attended the qualifying camps, using the regression equation based on the chosen parameters of the players [51]. The application of fuzzy modeling methods in the sports forecast allowed a number of authors [53] to find patterns that can express the swimmer's condition during the day after water training.

In general, the mathematical model will help to build a training plan and properly adjust the training process that leads the athlete to the peak of the sports form, minimizing the "physiological price" of the sporting result. Their use will allow minimizing the coaching practice of trial and error and will make it possible to conduct experiments not on the athlete himself, but on his

mathematical model, calculating the most acceptable training and recovery regimes. At the same time, the sports result will naturally grow the risk of overtraining and sports injuries will decrease.

Development of mathematical models for the development of adaptation in the process of sports training, methods for remote control and management of key biological functions that determine sporting achievements, and the creation of an automated system for managing the physical condition of athletes can take an important place in the theory and practice of sports science. With the help of this method, it is possible to model any physiological, biochemical and biomechanical processes, since the possibilities of mathematical modeling are universal in nature, which makes it possible to consider

it as the future of sports physiology and biomedicine [55].

At the same time, the number of recorded data in sports practice can be quite large, measured in different scales, reflecting the values of both quantitative and qualitative indicators, differ in different scales and inaccuracy of measurements. The problem can also lie in the existence of hidden regularities, which are very difficult to detect or are not yet possible due to the large combinatorial complexity (the amount of computation) of the computational algorithms [56].

Therefore, according to the results of some studies, it was revealed that there are significant differences in the athletes' training ability, determined mainly by two genetic factors: the body's reaction rate and the specific time reference system in the body [57]. Training

was specific, that is, some athletes showed high training in strength training and almost no result in training for endurance, and vice versa. And in such cases, inadequate choice of sport or style of competitive activity can dramatically slow the growth of sports achievements.

In general, the results of the development of sports science to date have shown that the most noticeable parameters affecting the athletic quality are biological, including genetics [58-60], physiological processes (especially changing in time, such as growth and aging [61- 63]) and the environment [64, 65], which can be natural (e.g., ambient temperature, gas composition, barometric pressure, etc.) or artificial (human) based on cultural [66] and technological [67] contexts.

The study of the current changes in the implementation of exercises at the cellular and molecular levels led to the development of a new field in sports science, known as genetic medicine [68, 69].

Based on the work in this field concerning molecular genetic predictors, many potentially important markers have been identified - DNA polymorphisms that promote propensity for success in certain types of sports. Over the past twenty years, it became known that the growth rates of the detection of genetic markers associated with sports activity were in geometric progression, amounting to 5 genes in 1997, 24 genes in 2000, 101 genes in 2004 and about 300 in Present time.

It turned out that the two most important qualities of athletes - endurance and power capabilities

vary significantly among individuals, even among well-trained athletes. At least 155 genetic markers (located in almost all chromosomal and mitochondrial DNA) are associated with elite status of athletes, of which the majority (93 genetic markers) has been associated with endurance, and the remaining (62 markers) with strength or power [44].

The results of a number of meta-analyses made it possible to establish that of the total number of genetic markers identified to date, only 31 showed positive associations with athlete status in at least 2 studies and 12 in 3 or more studies [70-73]. On the other hand, the value of 29 markers (24%) was reproduced in only one study, which indicates a possible false positivity of the information or an entirely different version, the

reason of which may be the following.

It is well known that athletes dominating in certain sports come from specific geographical areas (eastern or western regions of Africa, southern Asia), for example marathoners from Ethiopia or Kenya, sprinters from Jamaica or the USA, gymnasts and figure skaters from Japan, Korea or China [58, 59, 66]. Although these cases are more likely to reflect the historical socio-economic and cultural characteristics of each region, it is assumed that the residence-specific isolation of athletic qualities is based on the uneven distribution of genetic characteristics and relates to the physical and metabolic properties of individuals living in each region [74].

On the other hand, it has been revealed that a number of high-

skilled athletes have a high level of physical endurance provided by very rare gene variants [75]. Thus, the rare: AA genotype for the CF gene, associated with rapidity and strength, the Ala/Ala genotype for the PPARG gene, and associated with large aerobic capabilities, the T gene of the HIF1 gene, were observed with high frequency in the teams of hockey players, unlike representatives of other sports. The high frequency of the rare C/C genotype for the VEGF gene, as well as the levels of the rare AA genotype for the CF gene and the rare allele T of the HIF1 gene, were lower in tennis players than in hockey players.

Naturally, understanding the genetic architecture of athletic opportunities is becoming an important step in the development of methods for identifying talents in sports and will be used in sports

selection. However, the selection of capable athletes only on the basis of the analysis of one gene is considered to be incorrect and insufficiently informative, since the absence of favorable allele of one gene can be compensated by positive variants of other genes. Whereas the presence of the desired allele can also not guarantee success due to the absence of other necessary gene variants. In addition, this or that physiological quality giving an advantage in sports can be conditioned not only by one genome, but by their complex, for example, the manifestation of endurance or speed-strength qualities are determined by a minimum of seven genes.

Recently, the opinion has been formed that the effectiveness of sports activities of athletes depends not only on the presence

of certain genes, but also on the level of their expression. This becomes especially relevant in cases of heterozygous carriage of the corresponding genes. Until now, the answer to the question of how genes are expressed in the heterozygous state under certain conditions, whether only one of the alleles will work (then which one, favorable or unfavorable?) or both, causing an average level of synthesis of the corresponding enzyme?

There are also alleles that limit the physical activity of a person by reducing or increasing the expression of genes, altering the activity or structure of their products, the consequence of which is at best a cessation of sports performance growth, at worst - the development of pathological conditions such as, for example,

excessive left ventricular myocardial hypertrophy .

Selective screening of young athletes for the carriage of mutations in genes predisposing to any pathologies or deterioration of the prognosis of rehabilitation will provide an opportunity to substantially reduce disability and mortality among athletes.

For example, in the presence of E4 alleles, the APOE gene is not recommended for boxing, since such persons greatly increase the likelihood of serious consequences of brain trauma. It was also revealed that the recovery process after traumatic brain injuries could be inhibited in Arg/Arg carriers of the TP53 gene and a number of other genes. The association of polymorphism of many genes with features of bone tissue metabolism, which vary with systematic increased physical exertion, in

many respects causes the risk of bone fractures in athletes [58].

Now it became known that there are big differences in the intensity of the work of genes in the training process for different people. With regard to clarifying the differences in the increase in gene expression in each athlete, depending on the intensity of short-term training or the duration of training with a moderate load, studies have just begun. They were based on the following postulate: a short-term physical load causes changes in the expression of hundreds of genes, which is restored to the original level after a certain time (seconds, minutes, hours). Directed on the development of endurance or speed-strength qualities of training represent in their essence various incentives external stimuli, leading to specific intracellular structural

and metabolic shifts in skeletal muscles. In this case, long-term adaptation to training of different directions is considered as a possible response of the body to a set of single physical exertions, accompanied by global changes in the system of regulation of gene expression.

Without clarifying the levels of gene expression in each specific case, it is as yet impossible to carry out both the correct selection of athletes and the choice of the optimal system of the training process and individual medical and biological support.

Therefore, by now available genetic tests based on small sample sizes and the chosen analytical methodology can lead to erroneous associations and reassessment of effect sizes, and of course, the use of such limited data will not allow predicting athletic capabilities with

high accuracy. In addition, up to now, most studies have focused on studying the effect of single genes, but in the future it becomes urgent to understand the interaction of each such gene with other genes and with the environment. If the studies that evaluate the genetic components of physical capabilities are focused on endurance and strength, future research should focus on defining genetic markers associated with other sports phenotypes such as flexibility, alignment, and temperament.

However, if more than two-thirds of the variations in the status of athletes can be attributed to genetic indicators, the rest is a consequence of the action: training, nutrition, equipment, motivation and sleep [68,76], so individual

athletic ability as a whole still determines the interaction Genetics with the influence of environmental factors.

A better understanding of sports phenotypes, associated genes and their interactions with environmental factors will ultimately help sports physicians and trainers identify individuals with the genetic potential of elite athletes and with a propensity for trauma and illness. Therefore, each athlete must have a genetic passport, which should indicate the variants of the genes necessary to achieve high sports results in the chosen sport, the expression levels of these genes at rest and under stress, as well as the genes of the risk of occupational pathologies.

REFERENCES

1. L.P. Matveev. The general theory of sports. - M.: 4th branch of Military Publishing, 1997. - 304s.
2. Perelelsky A.A. Physical Culture and Sport in Modern Conditions: Unity and Diversity // Theory and Practice of Physical Culture. - 2001. - No. 9. - P.103.
3. Baranov V.A. Justice in society and sports: an invitation to a discussion // Questions of cultural studies. - No. 9.- P.37-41.
4. Coakley J. Sports in society: issues and controversies. Boston: McGraw-Hill Higher Education, 2009.
5. Lenk H. Sport as a modern myth // Reason and Existence. Analysis of scientific and non-scientific forms of thinking. - St. Petersburg, 1999. -58p.
6. Morgan U. Philosophy of sports. Historical and conceptual review and assessment of its future // Logos. - 2006. - No. 3 (54). - P.147-159.
7. Scambler G. Sport and Society: History, Power and Culture. New York: Open University Press, 2005.
8. Lubysheva LI, Mochenov V.P. A new conceptual approach to the modern understanding of the social nature of sports // Theory and practice of physical culture. - 2015. - No. 4. - P.94-101.
9. Collins M.F. Sport and social exclusion. London: Routledge, 2010.
10. Sinyutin MV, Karapetyan R.V. The phenomenon of sport in the discourse of economic sociology // Vestnik SPbGU - 2015. - Ser. 2. - Issue. 1. - P.128-134.

11. Baranov V.A. Socio-philosophical comprehension of modern sport. \\
Sports science of Russia: state and prospects of development: materials of the
All-Russian scientific-practical conference dedicated to the 90th anniversary
of the journal "Theory and practice of physical culture" December 3-5, 2015 -
Moscow: FGBOU VPO "RGUFGKSMiT", 2015. - P.118-123.
12. Ibragimov M.M. The philosophy of sport as a new anthropological
project: a monograph. - K.: NUFVSU, publishing house "Olympus. Lit. ",
2014.-296s.
13. Milstein O.A. A theorem on pyramids: sports "big" or "small"? // Sport
for all. - 1997. - № 2. - P.11-14.
14. Acher R. "Sportofreniya" gives rise to record keeping // Sport for all. -
2001. - No. 2. - P.12 - 14.
15. Dyck N. Games, Sports and Cultures. Oxford: Berg, 2000.
16. Litvinenko S.N. Sport for all: socio-educational technologies. - Moscow:
Theory and practice of physical culture, 2005. - 368p.
17. Visitei N.N. Problems of the methodology of constructing the concept of
Olympism as a socio-cultural phenomenon // New thinking and the
Olympic movement. - Moscow: Publishing House "Knowledge", 1990. - P.58 -
69.
18. Harris J., Parker A. Sport and social identities. Basingstoke: Palgrave
Macmillan, 2009.
19. Elizarova T.G. Medico-biological aspects of overtraining of athletes in
speed-power sports // Act. Probl. Fiz. Culture: mat. Region. Scientific-
practical. Conf .: in 6 tons - Rostov-n / D., 1995. - T.6: Problems of higher
sports skills. - Part 2. - P. 125-128.

20. Mackinnon L.T. Effects of overreaching and overtraining on immune function // Overtraining in sport / Ed. By R.B. Kreider, A.C. Fry, M.L. O'Toole. - Champaign, IL: Human Kinetics, 1998. - P.219-241.
22. Petibois C., Cazorla G. Biochemical aspects of overtraining in athletes training for endurance // Vopr. Sport. Of medicine: notch. an experience. - 2010. - Issue. 1. - C.3-10.
23. Steinacker, J.M., Lehmann, M., Clinical findings and mechanisms of stress and recovery in athletes, in: Enhanced recovery: Preventing underperformance in athletes / Ed. By M. Kellmann. - Champaign, IL: Human Kinetics, 2002. - P.103-118.
24. Bruckner P. Nutrition and diet / / Sports injuries. Basic principles of prevention and treatment. - K.: Olympus lit., 2002. - P.252-272.
25. Kolb J. Environmental factors / / Sport. Medicine. - K.: Olimp. Lit., 2003. - P.265-280.
26. Iordanskaya F.A. Features of modern adaptation during flights to the east and west, means of correction and prophylaxis of desynchronosis // Theory and Practice of Phys. Culture. - 2000. - No. 3. - C.9-15.
27. Suslov F.P. Ecological conditions and the system of sports training / / Modern system of training athletes. - M.: SAAM, 1995. - P.305-323.
28. Kapilevich LV, Davletyarova KV, Koshelskaya EV and others. Physiological methods of control in sports - Tomsk: Izd. Tomsk. Polytech. University, 2009. - 160s.
29. Panfilov, OP. Adaptation reorganization of athletes during the flight in the western and eastern directions. // Theory and practice. Culture. - 1991. - № 5. - P.33-34.

30. Povzun AA, Apokin VV, Rodionov VA Comparative analysis of the change in the structure of biorhythms in swimmers of different sex for long flights // Theory and Practice of Phys. Culture. - 2012. - No. 10. - P.89-92.
31. Povzun AA, Apokin VV, Usayeva N.R. Change in the nonspecific adaptability of the organism of swimmers of different sex for long flights from east to west // Theory and Practice of Phys. Culture. - 2012. - No. 11. - P.92-94.
32. Povzun AA, Apokin VV, Povzun V.D. Rhythmological assessment of the urgent adaptation of athletes athletes in latitudinal movement // Theory and practice of physical culture. - 2014. - No. 12. - P.96-99.
33. Apokin VV, Povzun AA, Rodionov VA, Usayeva N.R. Biorhythmological analysis of the state of nonspecific adaptability of the organism of athletes of swimmers of different climatic and geographical // Theory and practice. Culture. - 2014. - No. 1. - P. 87-90.
34. Povzun AA, Apokin VV, Losev V.Yu., Snigirev A.S. Biorhythmological features of the state of adaptation abilities of the organism of swimmers athletes of different climatic and geographical regions // Theory and Practice of Phys. Culture. - 2013. - No. 3. - P.88-93.
35. Povzun AA, Apokin VV, Savinykh LE, Semenova OA Seasonal changes in the state of nonspecific adaptability of an organism of high-qualified athletes // Theory and Practice of Phys. Culture. - 2011. - No. 5. - P.86-88.
36. Povzun AA, Grigoriev VA, Apokin VV, Efimova Yu.S. Comparative analysis of seasonal changes in the adaptive capabilities of the athlete's skier's body in terms of biological rhythm indicators / / Theory and Practice of Phys. Culture. - 2010. - No. 8. - P.95-98.

37. Apokin VV, Povzun AA, Usaeva N.R. Change in the structure of biorhythms of the basic physiological indicators of well-adapted and highly adapted athletes of high qualification for flights from east to west // Theory and Practice of Phys. Culture. - 2011. - No. 12. - P. 83-87.
38. Yezhov SN, Krivoshchekov SG Chronoresistance, biorhythms and functional reserves of the organism in the phases of desynchronosis during temporary adaptation // Bul. Sibir. Ord. AMS of RF. - 2004. - No. 8. - P.25-28.
39. Povzun AA, Apokin VV Change in the structure of biorhythms during long flights in athletes-swimmers of high qualification / / Theory and practice of physical. Culture. - 2012. - № 5. - C.90-92.
40. Povzun AA, Apokin VV, Kiseleva AA, Streltsov V.A. Assessment of the state of nonspecific adaptability of well-adapted and poorly adapted sportsmen of high qualification for long flights from east to west // Theory and Practice of Phys. Culture. - 2011. - No. 11. - P.83-87.
41. Apokin VV, Povzun AA, Grigoriev VA Biorhythmological analysis of the state of nonspecific adaptability of the organism of swimmers of high qualification for long flights from east to west // Theory and practice of physics. Culture. - 2012. - No. 9. - P. 83-86.
42. Apokin VV, Povzun AA, Rodionov VA, Semenova OA Biorhythmological analysis of changes in the adaptive capabilities of the athlete's body during long flights from east to west // Theory and Practice of Phys. Culture. - 2010. - No. 11. - P.95-98.
43. Bakulev SE, Dvejrina OA, Afanasyeva IA, Chistyakov VA Individual training in stressed martial arts // Uchenye zapiski univers. them. P.F. Lesgaft. - 2013. - No. 8 (102). - C.16-24.

44. Ahmetov II, Egorova ES, Gabdrakhmanova LJ, Fedotovskaya ON Genes and Athletic Performance: An Update. Med Sport Sci. 2016, 61: 41-54.
45. Fogel R. Technophysio evolution and the measurement of economic growth. J Evol Econ. 2004; 14: 217-221.
46. How the data analysis won in the sport. - Electronic resource. - Access mode: // <http://www.computerra.ru/86411/sports-bigdata/>.
47. Solovieva OE, Markhasin VS Mathematical modeling in physiology // Physiological journal. - 2011.- P. 57.- No. 5.- P. 77-79.
48. Maszczyk A., Zając A., Ryguła I. A neural network model approach to athlete selection. Sports Engineering. 2011; 13 (2): 83-93.
49. Przednowek K., Wiktorowicz K. Prediction of the result in race walking using regularized regression models. Journal of Theoretical and Applied Computer Science. 2013; 7 (2): 45-58.
50. Papić V., Rogulj N., Pleština V. Identification of sport talents using a web-oriented expert system with a fuzzy module. Expert Systems with Applications. 2009; 36 (5): 8830-8838.
51. Roczniok R., Maszczyk A., Stanula A. et al. Physiological and physical profiles and on-ice performance. Isokinetics and Exercise Science. 2013; 21 (2): 121-127.
- 52.6. Haghighat M., Rastegari H., Nourafza N. et al. A review of data mining techniques for the outcome of prediction in sports. Advances in Computer Science. 2013; 2 (5): 7-12.
53. Mężyk E., Unold O. Machine learning approach to model sport training. Computers in Human Behavior. 2011; 27 (5): 1499-1506.

54. Volkov N.I. Biology of sports on the threshold of the XXI century / / Jubilee collection of works of scientists RGAFK, dedicated to the 80th anniversary of the Academy T.1. - Moscow: RGAFK, 1997. - P.55-60.
55. Pertzov S., Mezentseva L. Mathematical modeling in biomedicine // Bulletin of new medical technologies.-2013. - T.20.- No. 1.-C.4.
56. Duke V.A. Fragments of knowledge. Express Electronics, 2002, No. 6, P. 60-65.
57. Sologub EB, Taymazov V.A. Sports genetics. Tutorial. - M.: Terra - sport, 2000. - 127s.
58. Eynon N, Ruiz JR, Oliveira J. et al. Genes and elite athletes: a roadmap for future research. J Physiol. 2011; 589: 3063-3070.
59. MacArthur DG, North KN. Genes and human elite athletic performance. Hum Genet. 2005; 116: 331-339.
60. Wells DJ. Gene doping: the hype and the reality. Br J Pharmacol. 2008; 154: 623-631.
61. Tanaka H, Seals DR. Endurance exercise performance in Masters Athletes: age-associated changes and consequent physiological mechanisms. J Physiol. 2008; 586: 55-63.
62. Salthouse TA. When does age-related cognitive decline begin? Neurobiol Aging. 2009; 30: 507-514.
63. Berthelot G, Len S, Hellard P. et al. Exponential growth combined with exponential decline. Age. 2012; 34: 1001-1009.
64. Cheuvront SN, Haymes EM Thermoregulation and marathon running. Sports Med. 2001; 31: 743-762.

65. Haïda A, Dor F, Guillaume M. et al. Environment and scheduling effects on sprint and middle distance running performances. PLoS One. 2013; 8: e79548.
66. Guillaume M, El Helou N, Nassif H. et al. Success in developing regions: world records evolution through a geopolitical prism. PLoS One. 2009; 4: e7573.
67. Neptune RR, McGowan CP, Fiandt JM The influence of muscle physiology and advanced technology on sports performance. Annu Rev Biomed Eng. 2009; 11: 81-107.
68. Ghosh A, Mahajan PB. Can genotype determine the sports phenotype? A paradigm shift in sports medicine. J Basic Clin Physiol Pharmacol. 2016 Jun 1; 27 (4): 333-339.
69. Ahmetov II, Fedotovskaya ON Current Progress in Sports Genomics. Adv Clin Chem. 2015; 70: 247-314.
70. Alfred T., Ben-Shlomo Y., Cooper R. et al. ACTN3 Genotype, Athletic Status, and Life Course Physical Capability: Meta-Analysis of the Published Literature and Findings from Nine Studies. Hum Mutat. 2011 Sep; 32 (9): 1008-1018.
71. Ma F, Yang Y, Li X. et al. The association of sport performance with ACE and ACTN3 genetic polymorphisms: a systematic review and meta-analysis. PloS ONE. 2013; 8: e54685.
72. Lopez-Leon S, Tuvblad C, Forero DA Sports genetics: the PPARA gene and athletes' high ability in endurance sports. A systematic review and meta-analysis. Biol Sport. 2016 Mar; 33 (1): 3-6.

73. Yan X, Papadimitriou I, Lidor R, Eynon N. Nature versus Nurture in Determining Athletic Ability. Med Sport Sci. 2016; 61: 15-28.
74. Berthelot G, Sedeaud A, Marck A. et al. Has Athletic Performance Reached its Peak? Sports Med. 2015 Sep; 45 (9): 1263-1271.
75. Mosse IB, Gonchar AL, Zhur K.V. Et al. Comparison of the genotypes of athletes of different specialization in the complex of genes of sports success // Molecular. And butt. genetics. - 2012. - T. 13. - P.19-24.
76. De Moor MH, Spector TD, Cherkas LF et al. Genome-wide linkage scan for athlete status in 700 British female DZ twin pairs. Twin Res Hum Genet. 2007;10(6):812-820.

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THE FEATURES OF ENDOTHELIAL DYSFUNCTION IN PATIENTS WITH PERIODONTITIS COMBINED BRAIN CIRCULATION DYSFUNCTION

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ABSTRACT

Introduction. In the pathogenesis of microcirculation disorders in patients with chronic generalized periodontitis (CGP), an important role belongs to disorders of vascular-platelet, coagulative levels of homeostasis, as well as thrombotic resistance of vascular endothelium. Disorders in the homeostatic system in patients develops by type of disseminated intravascular coagulation (DIC) of blood. **We aimed** to assess the thrombogenic potential of blood during CGP in people with AVD.

Method. 52 patients with moderate CGP were observed and surveyed. 24 of them were without associated diseases; 28 patients – with CGP in

Health Science

Generalization of Scientific Results

combination with AVD. Hyperhomocysteinemia identified in patients with chronic generalized periodontitis associated with AVD is a consequence of metabolic disorders, primarily lipid peroxidation in periodontal tissues. Blood homocysteine may be subjected to oxidation, which released superoxide anion and other free radicals that damage the endothelium.

Results of the damaging effect of homocysteine are the development of endothelial dysfunction, accompanied by altered production of a number of regulatory substances produced by the endothelium, in particular reduced synthesis of nitric oxide, and prostacyclin and increased formation of thromboxanes. It is known that homocysteine reduces the anticoagulant activity of the endothelium of the vascular wall.

Conclusion. In patients with chronic generalized periodontitis associated with AVD the content of markers of endothelial dysfunction increases.

Key words: periodontitis, chronic generalized periodontitis, disseminated intravascular coagulation, atherosclerosis, and disorders of cerebral circulation.

INTRODUCTION

Currently, periodontal diseases are a complex problem that is not only medical but also social significance. This is primarily due to the high prevalence and intensity of destruction of periodontal tissues [1, 2, 3]. Numerous studies have found that

the occurrence of significant functional and morphological changes in the periodontal complex is due to universal pathogenetic mechanisms, emerging in various diseases of organs and systems. The relationship between somatic diseases and condition of the organs of the mouth is due to

disorders of metabolism, hemodynamics, microcirculation, immunological and neuroregulatory changes and shifts of the microbiota [4, 5].

In the pathogenesis of microcirculation disorders in patients with chronic generalized periodontitis (CGP), an important role belongs to disorders of vascular-platelet, coagulative levels of homeostasis, as well as thrombotic resistance of vascular endothelium. Disorders in the homeostatic system in these patients develop by the type of disseminated intravascular coagulation (DIC) of blood [6, 7, 8].

Many recent studies have shown that atherosclerotic vascular disease can lead to coronary heart disease and cerebral vessels disorders (cerebrovascular stroke). Atherosclerosis is preceded by a long, for decades, inflammatory

process that attacks the inner lining of vessels (endothelium), and vessels of any caliber, down to the smallest (capillaries), and not only arteries (capillaries), but the veins that is causing oxygen starvation of a number of internal organs and systems. Such a pathological process affects the vascular system [9, 10].

In recent years, the role of homocysteine was clarified in the development of endothelial dysfunction and atherosclerosis. Increased level of homocysteine damages the inner wall of arteries - intima covered by endothelium. Homocysteine level increases 5 mcmol/l through the risk of atherosclerosis and identifying 60% in men and 80% in women. In 2013 The European Federation of Periodontology and American Periodontology Academy issued a statement which indicates on the

high prevalence of periodontal disease in patients with atherosclerotic vascular disease (AVD), i.e. it was concluded that there is an increased risk of AVD in patients with periodontal diseases [11, 12]. It is not excluded that inflammatory processes affect each other when simultaneously present. Since there are significant gaps in our knowledge about the relationship between periodontal disease and AVD, more fundamental, invasive studies are needed.

The aim of the study is to assess the thrombogenic potential of blood during CGP in people with AVD.

PATIENTS AND METHOD

Patients

To achieve this goal 52 patients with moderate CGP were under our supervision. 24 of them were without associated diseases;

28 patients – with CGP in combination with AVD. Patients were on outpatient treatment in the clinic of the TSSI. Patients with AVD, aged 40-65, were mainly of contingent suffering from disorders of cerebral circulation, caused by atherosclerosis of cerebral vessels and were under outpatient observation. In 78,8% of patients were noted related hypertension.

Exclusion criteria were age older than 70 years, myocardial infarction in anamnesis prescription for at least 6 months, insulin-dependent diabetes mellitus, and malignant tumors. In this group of patients with AVD chronic cerebral ischemia was revealed on the basis of ultrasonic dopplerography of cerebral vessels, estimating the thickness of the CCI.

When stating the CCI diagnosis of average degree, classification of periodontal

diseases, adopted at the XVI Plenum of the all-Union society of dentists (1983), was used. The comparison group (control) consisted of 12 patients aged 35-40 with intact periodontium without somatic pathology.

Ethical principles that reflect the Helsinki Declaration of the World Medical Association (1964) were complied while working with the patients.

For the objective assessment of periodontal tissues, the examination of patients with CGP combined with AVD was carried out according to the following criteria:

- definition of papillary-marginal-alveolar index C. Parma et al (1960);
- determination of bleeding gums when probing Barer, Lamarca (1996);

- sample functional capillary resistance by V. I. Kulazhenko (1960);
- the determination of the index of peripheral blood in periodontal tissues in Dedova L. N. (1981);
- determination of the degree of mobility of the teeth, by A. I. Evdokimov (1953);
- determination of the depth of periodontal pockets according to WHO (1990);
- the definition of periodontal index by Russel A. (1956);
- determination of hygienic index by Green J. C., and Vermilion, J. R. (1960).

To assess the status of vascular endothelium in patients with chronic generalized periodontitis were carried out:

- determination of anticoagulant activity of the vessels endothelium;

- determination of fibrinolytic activity of vascular endothelium;
- determining the content of endothelin in the blood serum;
- determination of homocysteine in serum.

Techniques

In all cases, the blood sampling was performed in the morning on an empty stomach by gravity into a plastic tube. Blood for research was taken from the cubital vein twice: in the amount of 10 ml before cuff samples (3-5 minute clamping of the vessels of the shoulder with cuff from sphygmomanometer) and 5 ml after cuff sample. 5 ml of blood obtained before cuff samples were subjected to centrifugation (3000 rpm) for 10 minutes to obtain serum for research on the content of homocysteine and endothelin -1. Serum samples were quickly frozen and stored at minus 20°C in well-

closed vials. 5 ml of blood obtained before cuff sample and 5 ml of blood obtained after cuff samples were stabilized with 3.8% sodium citrate solution in 9:1 ratio. The studies were conducted in platelet-poor plasma, which was obtained by double centrifugation: first at 1000 rpm (7 minutes), then at 3000 rpm (15 minutes). Centrifugation was performed immediately after blood sampling, the selection of the plasma on the study – immediately after centrifugation. Plasma samples were analysed no later than 3 hours after blood sampling. To determine the anticoagulant activity of the endothelium of the vascular wall the determination of the level of activity of antithrombin III (AT III) levels before and after cuff sample was carried out. The ratio of AT III activity before and after cuff samples characterizes the allocation of its endothelial cells.

Normally, following cuff sample a release of anticoagulants into the blood happens (increased activity of AT III). For determining the AT III activity, a set of firm "Human" was used. For determination of fibrinolytic activity of vascular endothelium, determination of Hageman's factor-dependent fibrinolysis rate of blood plasma was performed before and after cuff samples (3-5 minute clamping of the vessels of the shoulder with cuff). The ratio of the speed of Hageman's factor-dependent fibrinolysis before and after cuff samples characterizes the release of endothelial cell tissue plasminogen activator (t-PA) and plasminogen activator inhibitor (PAI-1). Normally, after the cuff sample, t-PA is released into the blood and the production of PAI-1 decreases, leading to increased speed of

Hageman's factor-dependent fibrinolysis. The Hageman's factor-dependent fibrinolysis was determined using the set of the company "RENAM" (Russia). Determination of the level of endothelin I and homocysteine in the serum was performed by an immunofermental method using a set of firm "Human». Laboratory tests were conducted on the immunofermental analyzer of the firm "ROSH".

The 1999 classification system for periodontal diseases and conditions listed six major categories of periodontal diseases, of which 2-6 are termed *destructive* periodontal disease, because the damage is essentially irreversible. The 1999 International Workshop for a Classification of Periodontal Disease and Conditions are as follows: [21]

I. Chronic periodontitis (CP):

- A. Localised
- B. Generalised

II. Aggressive periodontitis (AP):

- A. Localised
- B. Generalised

III. Periodontitis as a manifestation of systemic diseases (NP):

A. Connected with blood diseases

- 1. Acquired neutropenia
- 2. Leukaemia
- 3. Others

Statistical analysis

Statistical processing of obtained data was carried out using the software package Statistics 6.0. Hypotheses about the form of distributions (Shapiro-Wilks) was tested. Most of our data do not conform to the normal distribution, so for comparisons of values the U-criterion of Mann-Whitney on the basis of which Z –

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IV. Necrotizing periodontal diseases (NP)

- A. Necrotizing ulcerous gingivitis /NUG)
- B. Necrotizing ulcerous periodontitis (NUP)

V. Periodontal abscesses

- A. Gingival abscess
- B. Periodontal abscess
- C. Pericoronal abscess

VI. Periodontitis with endodontal lesions

- A. Combined paro-endo lesion

criterion and an indicator of reliability of p was calculated. The differences were considered statistically significant at $p < 0.05$.

RESULTS

The change of the immune properties of the endothelium in periodontitis is associated with damage and dysfunction. Therefore, as a result of the

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conducted researches that is established in patients with CGP there is a decrease in tromboresistance of vascular wall, which is manifested by inhibition of anticoagulant and fibrinolytic activity of the endothelium. The changes of tromboresistance of vascular endothelium depend on a combination of the underlying disease, i.e, chronic generalized periodontitis with AVD. In combined form of the disease, these changes are more expressed than in chronic generalized periodontitis. The reduction of anticoagulant activity of vascular endothelium in patients with periodontal disease are manifested by the inhibition of release of antithrombin III by vascular endothelium. It is known that the arginine - and lysine - specific cysteine proteases *Porphyromonas gingivalis* cause degradation and

initial item position in endothelial cells of micro-vessels of the gums of patients with periodontitis. At the same time, it is known that thrombomodulin binding thrombin, causes changes in the conformation of its active site, thereby increasing the rate of inactivation of antithrombin III. On the other hand, it is found that several inflammatory cytokines, particularly, interleukin-1, and tumor necrosis factor-alpha (TNF- α), cause a reduction in the anticoagulant activity of the endothelium of vascular wall. In this regard, it is most likely that in patients with CGP associated with AVD the reduction in anticoagulant activity of the endothelium of the vascular wall is due to both the direct influence of periodontopathic microflora and indirect action of immune mechanisms implemented in

existing long-term inflammation. The obtained data presented in **table-1** demonstrate that in patients with CGP associated with AVD, there is an increase in time of Hageman's factor-dependent fibrinolysis and decrease of fibrinolytic activity of vascular endothelium. Inhibition of fibrinolytic activity of vascular endothelium in combined form of the disease may be associated with a decrease in the allocation of tissue plasminogen activator (t-PA). At the same time in the literature, there is evidence that in patients with periodontitis the production of tissue plasminogen activator t-PA is enhanced, but also the production of the inhibitor of tissue plasminogen activator PAI-2 increases. The studies have found that in patients with CGP of moderate severity combined with AVD, in contrast

to Chronic generalized Periodontitis (CGP), there is an increase in the content of serum of not only homocysteine, but also endothelin I. The concentration of homocysteine in the serum is higher than in CGP without comorbidities. Homocysteine is cytotoxic amino acids and its low content in cells is ensured by remethylation to methionine and cysteine to transsulfuration. Remethylation of homocysteine to methionine occurs in all cells of the body by the enzyme methionine-synthetases, and as a coenzyme acts vitamin B₁₂. As the methyl group donor required for the conversion of homocysteine to methionine is used 5-methyltetrahydrofolate (5-MTHF), the active form of folic acid. In the process of transsulfuration the enzyme cystathionine- β -synthase catalyzes the conversion of

homocysteine and serine to cystathionine, which is then subjected to hydrolysis with the formation of cysteine and α -ketobutyrate under the influence of the enzyme cystathionase. As a coenzyme in both reactions vitamin B6 is used. In case of disorders of intracellular metabolism of homocysteine "the excess" homocysteine is excreted from cells into the extracellular space and in blood. This leads to the occurrence of hyperhomocysteinemia and, therefore, to the toxic effect on endothelial cells. It is known that during periodontitis, there are numerous metabolic disorders in periodontal tissues. Thus, the change in the phagocytosis of bacteria by leukocytes polymorphonuclear in combination with the delay of neutrophil apoptosis is

accompanied by hyperproduction active forms of oxygen, exacerbating the pathological process. In periodontal tissues the intensity of free radical oxidation increases, the number of SH-groups reduces, resulting in significant damage to the cell membranes.

DISCUSSION

Likely identified in patients with chronic generalized periodontitis associated with AVD hyperhomocysteinemia is a consequence of metabolic disorders, primarily lipid peroxidation in periodontal tissues. Blood homocysteine may be subjected to oxidation, which releases superoxide anion and other free radicals that damage the endothelium. The result of the damaging effect of homocysteine is the development of endothelial dysfunction, accompanied by

altered production of a number of regulatory substances produced by the endothelium, in particular reduced synthesis of nitric oxide, and prostacyclin and increased formation of thromboxanes. It is known that homocysteine reduces the anticoagulant activity of the endothelium of the vascular wall, due to the degradation of thrombomodulin, lowering the expression of the complexes of antithrombin III-heparin on the surface of endothelial cells and significantly reduces the activity of C protein. Additionally, homocysteine causes a decrease in the activation of plasminogen, due to the stimulation of thrombin-activated fibrinolysis inhibitor – TAFI. It is important to note that homocysteine increases the gene expression of plasminogen activator inhibitor-1 (PAI-1), which inhibits fibrinolysis.

Thus, the results of the study are coordinated with the data of domestic and foreign authors and confirm the diagnostic and pathogenetic significance of the concentration of homocysteine in the blood during chronic generalized periodontitis especially when combined with AVD.

In healthy people, the level of endothelin I in the blood is low, which, combined with a short half-life limits its hemodynamic effects. However, under certain pathological conditions, endothelin-I, being a powerful vasoconstrictor, causes significant hemodynamic changes: a decrease in heart rate and stroke volume of the heart, increased vascular resistance, promotes remodeling of vasculature [13, 14]. The vasoconstrictor effect is realized by binding of endothelin-I, ETA-

receptors, which with the participation of the Gq-protein activates phospholipase C, producing diacylglycerol and Inositol-3-phosphate, which activates C-kinase and cause the flow of calcium ions into vascular smooth muscle cells [15]. The differences of physiological and pathological roles of endothelin I, determine its diagnostic significance as a marker of damage and dysfunction of endothelial cells. The main stimulator of the production of endothelin I by the vascular endothelium is reactive oxygen species, inflammatory cytokines, such as IL-1, IL-6 and TNF- α . It is experimentally proved that the inflammatory process in the periodontium contributes to the development of oxidative stress in the vascular wall. Therefore, a

potential mechanism for the detected increase in the concentration of endothelin I in periodontitis may be the induction of oxidative stress in endothelial cells [16, 17, 18]. Probably, the increase in the concentration of endothelin in the serum of patients with chronic generalized periodontitis associated with AVD, should be seen as a reaction to systemic manifestations of the inflammatory process. The uneven increase in the concentration of endothelial dysfunction markers in chronic generalized periodontitis and when combined with ASS is probably due to the complex biochemical mechanisms of development of dysregulation of the production of endothelin I on the background of hyperhomocysteinemia [9, 14, 17].

Table 1

Indicators of hemostasis and homocysteine in blood of patients with CGP combined with AVD

No	Indicators	Healthy people with intact periodontium N =12	Patients with chronic generalized periodontitis N= 24	Patients with CGP combined with AVD N=28
1	Antithrombin -III before cuff samples, %	97,61 + 8,11	85,06 + 6,54	78,51 + 5,44*
2	Antithrombin -III after cuff samples, %	124,3 + 9,74	102,4 + 8,76	90,1 + 7,53
3	The index of the anticoagulant activity of the endothelium conv.un.	1,24 + 0,11	1,18 + 0,09	1,15 + 0,07
4	XIIa -dependent fibrinolysis before cuff samples sec.	605,6 + 13,7	564,0 + 12,3	687,0 + 14,5*
5	XIIa -dependent fibrinolysis after cuff samples sec.	380,3 + 11,9	398,0 + 12,3	499,0 + 14,5*
6	The index of the fibrinolytic activity of the endothelium conv.un.	1,56 + 0,08	1,41 + 0,09	1,36 + 0,07*
7	The concentration of homocysteine mcmol/l	8,81 + 0,61	9,54 + 0,08	14,23 + 0,11*
8	The concentration of endothelin -1 plasma mcmol/l	1,61 + 0,13	2,18 + 0,16	5,34 + 0,32*
9	Soluble fibrin - monomer complex mg/ dl	2,91 + 0, 15	4,41 + 0,37	7,91 + 0, 68*

Note: * - the significance of differences when comparing the control group
 $P < 0,05$

CONCLUSION

Thus, the development of chronic generalised periodontitis is

accompanied by the appearance of endothelial dysfunction, which is manifested by increased concentrations of homocysteine

and endothelin I. In light of the severity of chronic generalised periodontitis increases only the concentration of homocysteine, and at an average of homocysteine and endothelin-I. In chronic generalised periodontitis, endothelial dysfunction is more

pronounced in men than in women. The results of our own research and literature data allow to conclude that in patients with chronic generalized periodontitis associated with AVD the content of markers of endothelial dysfunction increases.

REFERENCE

1. Bezrukova I. V., Grudyanov A. I. Aggressive forms of periodontitis. - M.: MIA. - 2002.-P.127.
2. Beloklitskaya G. F. A modern view on classification of periodontal diseases // Modern dentistry.-2007№3.-P.59-64.
3. Brown A. The application of the ultrasonic unit VECTOR in the treatment of periodontitis / A. Braun, F. Krause, A. Schiffer, M. Fritzen / Clinical dentistry.-2001.-№3.-P.62-65.
4. Bulkina N. V. The relationship and interaction of inflammatory periodontal diseases on the cardiovascular system and the gastrointestinal tract // Clinical dentistry. - 2010.№2.P.28-29.
5. Wolf H. F. Periodontology / H. F. Wolf, E. M. Rateitschak, K. Rateitschak; trans. from German.; ed. by G. M. Barrera. - M.: Medpress-inform. - 2008. - 548p.
6. Inflammatory periodontal disease during HelicobacterPylori - associated gastroduodenal pathology. Clinical, morphological and immunohistochemical examination / A. V. Lepilin, N. V. Bulkina, L. Y. Ostrovskaya, etc.// Russian dental journal.2008.№2. - P. 15-18.
7. Dmitrieva L. A. Modern aspects of clinical Periodontology. - M ., 2001.-125p.
8. A comprehensive study of the mechanisms of development of chronic inflammation in periodontitis / Ivanushko T. P., Gankovskaya L. V., Kovalchuk L. V., etc. / / Dentistry.-2000.-№4.-P.13-16.
9. Malezhik M. S., Malezhik L. P., Pinelis Y. I. Procoagulant properties of blood and saliva in patients with chronic generalized periodontitis in

elderly ages// Thrombosis, bleeding, DIC-syndrome. Modern approaches to diagnosis and treatment: Rus. Conf. (M., 6–7 Dec. 2011 г.). – M., 2011. – P. 70–71.

10. Therapeutic dentistry: a textbook for high schools: at 3h. / Ed. prof. G.M. Barer. - M.: GEOTAR Media 2008. - Part 2: Periodontal diseases. - 236.

11. Lemetskaya TI, periodontal disease (parodontopatii), Moscow, 1972;

12. Rybakov AI, Ivanov VS, Clinic of Therapeutic Dentistry, Moscow, 1973.

13. Kuryakina NV, Kutepov TF Periodontal disease. - M.: "Medical Book", 2003, 160 p.

14. Lukinykh LM periodontal disease. Clinic diagnosis, treatment and prevention / LM Lukinykh, E.N. Zhulev, J.H. Chuprunova. - Nizhny Novgorod: Publishing House NSMA, 2005. - 322 p.

13. Peter Fedi. Periodontal ABC / Peter Fedi, Arthur Vernino John Grey.- Ed. House "ABC", 2003.- 287 p.

14. Mashchenko I. S. Some aspects of the dystrophic and inflammatory periodontal diseases / I. S. Mashchenko, A. B. Samoylenko // Journal of dentistry.1997.-№2.P.188-194.

15. Nikolaev E. N. Molecular genetic markers for the risk of generalized periodontitis and their application in diagnostics: author. dis ... Doc med.Sciences. - M., 2008.-40p.

Bulletin of the Council of young scientists and specialists of the Chelyabinsk region №3 (10) 2015.-5116. Pinelis, Y. I., Malezhik L. P., Malezhik M. S. the Adaptive capacity of the protective systems of the body in chronic generalized periodontitis in the elderly people // Academic Journal of Western Siberia. – 2011. – № 2. – P. 36–37.

17. Pinelis, Y. I. Dental status of elderly and senile age, suffering from atherosclerosis // VII Dentists' International Scientific-Practical Conference Materials. Przemisl.: Medicina, 2011. - T. 40. - P. 42-43.
18. Quantitative assessment of inflammatory cytokine gene expression in chronic adult periodontitis / F.A. Roberts, R.D. Jr. Hockett, R.P. Bucy, S.M. Michalek // Oral Microbiology & Immunology. - 1997. - Vol. 12, № 6. - P.
19. Hellwig E., J. Klimek, Attigny T. Therapeutic dentistry. - Lviv: GalDent, 1999.- With .235, 233, 237.
20. Tronstad L. Clinical endodontics / Leif Tronstad; Trans. with English .; Ed. prof. T. F. Vinogradov. - M.: MEDpress-2006 .- P. 97, 49.
21. Darije PlanĖak Ksenija JorgiĖ-Srdjak Zvonimir CuriloviĖ. New Classification of Periodontal Diseases // Acta Stomatol Croat, 2001. Vol. 35, br. 1. P. 89-93.

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All authors contributed to prepare the article equally. Author AR searched literature, wrote the protocol and prepared first draft of the manuscript. Author MA revised and improved the quality of manuscript. Author SS contributed to get required data and using in the article.

ANTIANEMIC EFFECTS OF GATHERING HERB BY EXPERIMENTAL POSTHEMORRHAGIC ANEMIA IN RABBITS

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ABSTRACT

In this work, authors studied the influence of the collection, in the form of 10% infusion, which is composed of various plants: pepper knotweed, knotweed, chamomile, common yarrow and licorice, on the morphology of the blood in experimental posthemorrhagic anemia (PHA). The results of experience have shown that gathering infusion in a dose of 10 ml/kg at posthemorrhagic anemias possesses antianemic property and on that effect, it does not concede to a preparation Ferask. Gathering infusion conducted to restoration of morphological structure of peripheral blood and the content of free iron in blood whey. Color index and hemoglobin contents in one erythrocyte increased in this period, the iron content in the serum was increased from 9.65 ± 0.05 to 19.2 ± 0.8 $\mu\text{mol/l}$ than anemia, also normalizability reticulocytosis and thrombocytosis. Under the influence of the drug Ferask in this period investigated the performance almost close to that of the intact group, but the level of hemoglobin and erythrocytes remained reduced, respectively by 17 and 15 % compared to the intact data.

Key words: Water piper, knotgrass, horse gowan, nosebleed, licorice Glicyrrhiza, Ferask, posthemorrhagic anemia.

INTRODUCTION

Flora of Uzbekistan is rich in medicinal plants, which are widely used in folk medicine [1]. Medicines from plants are usually less toxic, have no side effects. Their use is one of the methods of promoting human health. They enable faster recover after illness, increase vitality and protect from the adverse effects of the environment [2]. Therefore, obtaining and study of medicinal preparations based on vegetable raw materials, with a view to their implementation in medical practice is relevant.

Objective: This work is devoted to study the influence of the collection, in the form of a 10% infusion which is composed of plant: pepper knotweed (*Herba Polygoni hydropiperis*), knotweed (*Herba Polygoni Avicularis*),

chamomile (*Matricaria recutita* L.), common yarrow (*Achillea millefolium* L.) and licorice (*Glycyrrhiza glabra* L.), on the morphology of the blood in experimental posthemorrhagic anemia (PHA).

MATERIALS AND METHODS

The experiments were carried out at 25 gray, mature rabbits of either sex, gray suit; weighing 2-3 kg of PGA was reproduced by acute bleeding from a regional ear vein of the rabbits once [3]. Two days later after playing the PGA rabbits were divided into groups of 5 pieces. 1-group-the control group, received distilled water in the amount of a therapeutic drug; 2 group treated with infusion collection at a dose of 10 ml/kg and 3-for group of animals received the drug *feras* at a dose of 25 mg/kg, daily, orally,

once daily for 30 days. Blood samples were taken before, 2 days after phlebotomy and after 15 and 30 days of treatment. Morphological composition of peripheral blood were studied on indicators, which characterize most pronounced anemia-hemoglobin level in g/l, amount of erythrocytes in $\times 10^{12}$, color index, content of hemoglobin in one erythrocyte in PG, the iron content in blood serum in mmol/l, the number of reticulocytes in promilla and platelets in $\times 10^9$. etc. Elements of the peripheral blood was considered using Razvodnaya liquid in the chamber Goryaeva [4]. The iron content of the blood serum was determined using a set of firm Hostex antigen (Italy), calorimetric method for the endpoint.

The obtained results were processed by variation statistics

with consideration of student's criterion [5].

RESULTS

The results of the experiment showed that in second days after phlebotomy, rabbits were developed, the PGA, the evidence of which was the changes in the morphological composition of the peripheral blood (table.1). Thus, the level of haemoglobin decreased by 43.2 %, the number of red blood cells by 45.6 %, a color index utensils from 0.81 ± 0.09 to 0.73 ± 0.02 , the content of hemoglobin in one erythrocyte decreased from 27 ± 2.5 to 23.75 ± 0.05 , the content of iron in the serum decreased from 18.65 ± 0.05 to 9.65 ± 0.05 MK.mol/l ($P < 0.05$). Anabisetia were also accompanied by reticulocytosis, their numbers increased by 50 % and moderate thrombocytosis (30 %) than on any intact data.

Treatment with infusion of collection against the background of PGA showed that the most clearly hemostimulating effect was observed after 15 days of experiment (tab.1). As can be seen from the table, the hemoglobin level increased from 95 ± 3.0 to 103 ± 3.0 g/l, and the number of red blood cells with 4.0 ± 0.2 to 4.3 ± 0.4 million compared to anemia. Color index and hemoglobin contents in one erythrocyte increased in this period, the iron content in the serum was increased from 9.65 ± 0.05 to 19.2 ± 0.8 $\mu\text{mol/l}$ than

anemia, also normalizability reticulocytosis and thrombocytosis. Under the influence of the drug feras in this period investigated the performance almost close to that of the intact group, but the level of hemoglobin and erythrocytes remained reduced, respectively by 17 and 15 % compared to the intact data.

Table 1

Dynamics of changes of some indices of peripheral blood of rabbits with experimental PHAS treated with fee ($M \pm m$, $n=5$

Group	Hemoglobin, g/l	Erythrocytes, million	Color figure	The hemoglobin content in one erythrocyte, PG	The reticulocytes, % about	Trombone you thousand	Containing tion of serum iron, $\mu\text{mol/l}$
Intact	135 \pm 2,5	5 \pm 0,5	0,81 \pm 0,09	27 \pm 2,5	4,6 \pm 0,4	365 \pm 18,0	18,65 \pm 0,05
After the introduction of drugs in 15 day							
Infusion collection	103 \pm 3,0	4,3 \pm 0,4	0,77 \pm 0,03	25,2 \pm 0,05*	5,2 \pm 0,05	400 \pm 21,0	19,2 \pm 0,8*x
Ferask	117 \pm 2,0*x	4,5 \pm 0,2*	0,87 \pm 0,03*	29,2 \pm 0,8*	5,0 \pm 0,5	395 \pm 15,0	20,4 \pm 0,6*x
Control	95 \pm 3,0	4 \pm 0,2	0,71 \pm 0,05	23,75 \pm 0,05	6 \pm 0,5	425 \pm 25,0	9,65 \pm 0,05
After the introduction of drugs in 30 day							
Infusion collection	135 \pm 1,5*x	5,0 \pm 0,5*x	0,81 \pm 0,09*x	27,0 \pm 1,5*x	5,1 \pm 0,5	335 \pm 15,0*x	19,8 \pm 0,2*x
Ferask	134,6 \pm 1,6*x	5,0 \pm 0,1*x	0,82 \pm 0,02*x	26,9 \pm 0,1*x	4,5 \pm 0,5*	320 \pm 21,0*x	20,9 \pm 0,1*x
Control	105 \pm 3,5	4,2 \pm 0,05	0,7 \pm 0,02	24,2 \pm 0,08	4,9 \pm 0,1	415 \pm 13,0	14,5 \pm 0,5*

Note P* $<$ 0,05 in relation to anemia; P*x $<$ 0,05 relative to the control

References

1. Pulatova D. K. pharmacognosy quality study yarrow folgosinho. Abstract. Cand.Diss.- Tashkent,2002.,- 23..
2. Information search site "Medicinal herbs" /email: homeart.ru.,2008.- Highlander pepper (pepper water).
3. Manual on experimental (preclinical) study of new pharmacological substances. -Moscow, 2005.- 52 p
4. A compendium of clinical methods of research (under revision by Professor E.A.Kost-Moscow,1975.-S.12-24.
5. Belenky, M. Elements of a quantitative evaluation of pharmacological effect. - Riga,1963.- 81 C.

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DISTRIBUTION PATTERN OF EXTRACELLULAR DNA OF THE MOTHER AND FETUS PHYSIOLOGICAL PREGNANCY

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ABSTRACT

Background. Concentration of extracellular DNA of the mother and fetus with the development of pregnancy remains unclear. Increasing extracellular fetal DNA concentration in maternal circulation is due to the possible reduction of DNA elimination from mother's body, cause can be various physiological changes of the functions in the excretory women's organs during pregnancy.

The Aim is to analyze literature to identify new markers in non-invasive prenatal diagnosis during pregnancy period.

Material and Method. Depending on the gestational age pregnant women were divided into 3 groups and 1st group included 27 pregnant with physiological course of gestation, and without fetal abnormalities in the first trimester, 2nd group consisted of 29 pregnant women in the II trimester and 3 group consisted of 21 pregnant in the third trimester of gestation.

Pregnancy in women ranged from 5 to 12 weeks in 1st trimester (n=27),

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from 15 to 19 weeks in 2nd trimester (n=29) and from 27 to 38 weeks in the third trimester (n=21) of pregnancy. The average age of women amounted to $27,0 \pm 0,5$ years.

Results. The total concentration of extracellular DNA fraction in the plasma of pregnant women in the first trimester was $22.6 \pm 3,2$ ng/ml, in the second trimester- $10.8 \pm 9,1$ ng/ml and in the III trimester of pregnancy was $74.3 \pm 4,0$ ng/ml. The concentration of extracellular DNA, eluted from the cell surface is equal to $467,2 \pm 16,3$ ng/ml, $192,1 \pm 3.5$ ng/ml and $387,5 \pm 11,6$ ng/ml in the I, II and III trimesters of pregnancy, respectively. Fetal DNA is present on the cell surface of the mother's blood, but the main part of the fraction of DNA associated with the surface of the cells, presented DNA of maternal origin. The mechanisms, which observes the distribution of extracellular DNA in the blood of pregnant women, until today it is unknown. In this research, it is established that the basic number as the maternal (over 90%) and fetal DNA (over 60%) is due to the surface of blood cells.

Conclusion. During physiological pregnancy, concentration of extracellular DNA is changing and there is a tendency to decreased levels of maternal and fetal extracellular DNA during 2nd trimester of pregnancy.

Key words: maternal DNA, fetal DNA, pregnancy, extracellular DNA, gestation.

INTRODUCTION

One of the promising and new directions is a non-invasive prenatal diagnosis may be the analysis of extracellular fetal DNA

in the blood of pregnant women.

In 1997, the first time this was demonstrated the presence of fetal extracellular DNA in plasma and serum of pregnant women [1, 2, 3].

This discovery has led to intensive study of fetal DNA as a potential marker for noninvasive prenatal diagnosis [4, 5, 6]. Biological basis, which occurs due to the increase in the concentration of extracellular DNA of the mother and fetus with the development of pregnancy, remains unclear [7, 8, 9]. There is a perception that increasing the concentration of extracellular fetal DNA in maternal circulation is due to the possible reduction of elimination of DNA from the mother's body, the cause can be various physiological changes of the functions in the excretory women's organs during pregnancy [10, 11]. It is proved

[12, 13] that in the blood plasma of pregnant women circulate longer molecules of DNA than in plasma of non-pregnant women. The fetal DNA molecules are generally shorter than maternal DNA, and more fragmented.

It is assumed that the fetal DNA enters the mother's blood by transport across the placenta of fetal cells that rapidly destroys the immune system of the mother and as a result the lysis of placenta cells, and direct release of DNA from the fetus in the mother's blood [14, 15]. Fetal DNA is already detected in the first weeks of fetal development (80% of pregnant women it was found on the 28th day after conception) [14]. These data shows that fetal DNA appears in maternal blood before the time of formation of the circulatory system of the fetus. Currently, many works confirm

that the source of extracellular fetal DNA in the maternal bloodstream are trophoblast cells [15]. Modern technologies allow using new knowledge in the practice of medicine [16, 17, 18, 19]. Thus, the analysis of the literature of recent years shows that further study of the nucleic acids' fetus in the mother's blood is necessary to identify new markers in non-invasive prenatal diagnosis during pregnancy period.

Materials and methods:

During the process of this work examined pregnancies in the dynamics of gestation, which had been under surveillance during 2014-2016 in maternity complex №9 Tashkent. Depending on the gestational age pregnant women were divided into the following groups: 1 group consisted of 27 pregnant women with

physiological course of gestation, and without fetal abnormalities in the first trimester, 2 group of 29 pregnant women in the II trimester and 3 group consisted of 21 pregnant in the third trimester of gestation. Pregnancy in women ranged from 5 to 12 weeks in the first trimester (n=27), from 15 to 19 weeks in the second trimester (n=29) and from 27 to 38 weeks in the third trimester (n=21) of pregnancy. The average age of women amounted to $27,0 \pm 0,5$ years.

Information on pregnancy outcomes in women participating in the research were analyzed after birth. In the analysis of the study were included pregnant women without complications during gestation and fetal abnormalities. A method of measuring the concentration of fetal DNA in the mother's blood

was to conduct a quantitative real-time PCR. To assess characteristics of circulating extracellular DNA in the blood of pregnant women at different stages of pregnancy were analyzed and the ratio of the fractions of freely circulating in plasma and associated with cell surface DNA. The capture material was carried out with the informed consent of the pregnant women who participated in the study.

RESULTS

The concentration of the total fraction extracellular DNA

(DNA of the mother and fetus) in the plasma of pregnant women in the first trimester was 22.6 ± 3.2 ng/ml, in the second trimester- 10.8 ± 9.1 ng/ml and in the III trimester of pregnancy was 74.3 ± 4.0 ng/ml. The Concentration of extracellular DNA, eluted from the cell surface is equal to 467.2 ± 16.3 ng/ml, 192.1 ± 3.5 ng/ml and 387.5 ± 11.6 ng/ml in the I, II and III trimesters of pregnancy, respectively (table 1).

Table 1

The concentration of extracellular DNA in the blood of women during pregnancy.

Pregnancy period (weeks)	The concentration of DNA in plasma, (ng/ml)	DNA concentration, associated with the surface of blood cells, (ng/ml)
9 \pm 1 (n=27)	22,6 \pm 3,2	467,2 \pm 16,3
17 \pm 0,2 (n=29)	10,8 \pm 9,1*	192,1 \pm 3,5*

30±0,4 (n=21)	74,3±4,0* ▼	387,5±11,6* ▼
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Note: * - compared with patients in the 1st trimester of gestation (P<0,05);

▼ - compared with patients in the second trimester (P<0,05).

When comparing pregnant woman's body as concentrations as circulating and associated with the cell membrane extracellular DNA at different stages during normal pregnancy, we revealed changes in the level of factions during pregnancy period (p>0.05). On the other hand, the differences in the concentrations of extracellular DNA in plasma between the trimesters of pregnancy, has been demonstrated previously [5, 11]. In our research it was shown that, there is some tendency to the decrease of DNA level in plasma and the concentration of DNA, associated with the surface of blood cells during the second trimester of pregnancy (table 1). Apparently, this is due to such physiological changes in the

pregnant woman's body as hemodilucia.

As a result of the analysis that the main part of the fraction of extracellular DNA (over 90%) is linked to the surface cells in maternal blood (table 1). It is possible that the changing nature of the distribution of extracellular DNA between plasma and formed elements in the blood of women is observed in such complications of pregnancy like missed miscarriage, preeclampsia, and in cases of pregnancy of fetuses with malformations [7, 13, 14]. In this regard, it seems reasonable to study the peculiarities of the circulation of extracellular DNA of the mother and fetus during various states of gestation to evaluate the potential use of this

marker for non-invasive prenatal diagnosis and monitoring of the pregnancy.

At this stage, works with the help of method PCR in real time were analyzed the level of fetal and maternal extracellular DNA circulating freely in the plasma and associated with the cell

surface in normal pregnancy, and evaluated the relationship of DNA concentration with a pregnancy period. The meanings of average concentrations of fetal and maternal DNA in normal maternal pregnant blood is presented in table 2 and 3.

Table 2

The concentration of extracellular fetal DNA (copies/ml) in the blood of pregnant women with physiological course of gestation, without fetal abnormalities

The term of gestation (weeks)	The concentration of fetal DNA in the plasma	Fetal DNA, associated with the surface of blood cells of the mother		Total associated extracellular fetal DNA
		IB	BKP	
I trimester (n=27)	32,6±1,7▼	26,5±2,8▼	57,2±3,3▼	83,7±3,1▼■
II trimester (n=29)	43,3±1,4*	31,4±5,2*	36,5±2,6*	67,9±3,7*■
III trimester (n=21)	64,7±6,3*▼	36,1±1,4*▼	88,3±2,5*▼	124,4±1,9*▼■

Note: * - differences with regards to these patients in the 1st trimester of gestation ($P < 0.05$); ▼ differences in these patients in the second trimester ($P < 0.05$); ■- differences total associated fetal DNA relatively to its concentration in the plasma ($P < 0.001$); (ionic interactions; cell surface proteins).

In the present research revealed that, fetal DNA is present on the cell surface of the mother's blood, but the main part of the fraction of DNA associated with the surface of the cells, presented DNA of maternal origin.

From the obtained data it is seen that the concentration of fetal DNA in the fraction (table 2), associated with the surface of cells by ionic bonds, comparable to

those in maternal plasma and slightly higher level of extracellular DNA was observed in the fraction, bounded to proteins of the cell surface. Moreover, this type of distribution of the total fraction of extracellular DNA in the blood of pregnant women, the basic amount of fetal DNA (over 60%) is also associated with the surface of blood cells of the mother

Table 3.

The term of gestation (weeks)	The concentration of DNA in mother's plasma	Extracellular DNA, associated with the surface of blood cells of the mother		Total associated extracellular DNA of the mother
		IB	BKP	

I trimester (n=27)	232,5±4,6	134,2±2,9	3521,0±5,7	3655,2±5,9■
II trimester (n=29)	272,4±4,9	95,7±1,8*	2193,5±4,9*	2289,2±4,8■
III trimester (n=21)	978,1±2,7*▼	344,9±7,1*▼	3735,2±6,4▼	4080,1±6,7■

Note: * - differences with regards to these patients in the 1st trimester of gestation ($P<0,05$); ▼ - differences in these patients in the II trimester ($P<0,05$); ■ - the differences of the total bound DNA relative to its concentration in the plasma ($P<0,001$); (ionic interactions; cell surface proteins).

The mechanisms, which observes the distribution of extracellular DNA in the blood of pregnant women, until today it is unknown [4, 9]. In our research, it is established that the basic number as the maternal (over 90%) and fetal DNA (over 60%) is due to the surface of blood cells.

Thus, it can be assumed that the described circulation of extracellular DNA in the blood of

pregnant women are observed due to the action of similar mechanisms, whose role remains to be seen. Probably a higher concentration of extracellular DNA on the surface of red blood cells, compared to plasma, due to the presence of a certain degree of affinity membrane structures and circulating DNA, as it was demonstrated previously [5, 12]. In addition, it is possible that

DNA molecules of different lengths, including those in the nucleotide proteinemia [9] and lipoprotein complexes [8, 18], have different binding capacity to the surface of red blood cells. However, it should be noted that molecules circulating DNA of mother and fetus differ significantly in their size, namely fragments of maternal DNA have a greater length than the DNA of the fetus [20]. This fact, on the other hand, confirms the possible influence of this mechanism on the characteristics of the circulating DNA of maternal origin.

Circulation of extracellular DNA during pregnancy should be taken into account when conducting molecular genetic diagnosis. It was noted that during normal pregnancy the concentration of extracellular DNA changes [21]. In our study it was shown that, there was also some tendency to reduce the level of maternal and fetal extracellular DNA in the II trimester of pregnancy (table 4). Apparently, this is due to gemodilucia - physiological changes in the pregnant body.

Table 4.

The change in the level of extracellular DNA during pregnancy

Trimester	The concentration of extracellular DNA from the surface of blood cells		The efficiency Exposure of fetal DNA (%)
	Level measurement of DNA,	Measurement of DNA level using real-time PCR, copies/ml	

	ng/ml	The mother's DNA	Fetal DNA	
I	467,2±16,3▼	3655,2±5,9▼	83,7±3,1■	94
II	192,1±3,5*	2289,2±4,8*	67,9±3,7*■	67

Note: * - differences concerning to these patients in the 1st trimester of gestation ($P < 0,05$); ▼ - differences regarding the data of the patients in the second trimester ($P < 0,05$); ■ - differences of fetal DNA relative to the DNA of the mother ($P < 0,001$).

DISCUSSION

Previously it was shown that the sharp increase in the level of extracellular fetal DNA is observed only in the last weeks of pregnancy and during childbirth [3, 5, 6], whereas in our study the pregnancy in women trimester II amounted to an average of 30 weeks. In the work, where such communication could be traced, gestational period ranged from 35 to 42 weeks [7, 8]. It is interesting

to note that the relationship between the level of fetal DNA and the period pregnancy in our research was detected in the fraction of fetal DNA, associated with the surface of cells of maternal blood. It is most likely that a significant increase in the level of fetal DNA in the mother's blood into the last weeks of pregnancy is the result of a gradual increase in the permeability of the placental

barrier [9]. To test this assumption was the analysis of the dynamics of the concentration of fetal DNA in the late stages of pregnancy [10]. It has been shown that in the late third trimester was observed a significant correlation between duration of pregnancy and the level of fetal DNA, and the increase in the concentration of fetal DNA averaged 29,3% for each subsequent week of pregnancy.

The biological basis through which describes observed changes in the level of extracellular DNA of the mother and fetus during pregnancy, until today, unknown. However, the increase in the level of DNA, both mother and fetus during pregnancy favors the fact that the mechanisms of release of fetal and maternal DNA in the bloodstream and their elimination from the body may have similar

nature. So, for example, it is believed that the source of fetal and maternal DNA are the cells of the fetal and maternal parts of the placenta, namely, the DNA of the fetus is the product of vital functions of trophoblast cells, whereas the DNA of the mother - cells of the decidua [11, 16, 18]. It has been shown that late in the third trimester was observed a significant correlation between duration of pregnancy and the level of fetal DNA, and the increase in the concentration of fetal DNA averaged 29,3% for each subsequent week of pregnancy.

The biological basis through which describes observed changes in the level of extracellular DNA of the mother and fetus during pregnancy, to date, unknown. However, the increase in the level of DNA, both mother and fetus

during pregnancy favors the fact that the mechanisms of release of fetal and maternal DNA in the bloodstream and their elimination from the body may have similar nature. So, for example, it is believed that the source of fetal and maternal DNA are the cells of the fetal and maternal parts of the placenta, namely, the DNA of the fetus is the product of vital functions of trophoblast cells, whereas the DNA of the mother - cells of the decidua [19, 20, 21].

Thus, the analysis of the level of extracellular DNA in the blood of pregnant women, including in combination with the assessment of the nature of the distribution of DNA between the plasma and the surface of blood cells, can be successfully used as an additional noninvasive marker of pathology fetal development and violations of the course of gestation.

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CONCLUSIONS

1. During physiological pregnancy concentration of extracellular DNA is changing and there is a tendency to decreased levels of maternal, and fetal extracellular DNA during the second trimester of pregnancy.

2. To enhance the information content of non-invasive diagnosis of pathological conditions at different periods of pregnancy, it seems appropriate to use a fraction of fetal extracellular DNA associated with the surface of blood cells of the mother.

AUTHOR'S CONTRIBUTION

The sole author designed, analyzed, interpreted, and prepared the manuscript.

CONSENT

It is not applicable.

COMPETING INTERESTS

Author has declared that no competing interests exist.

Generalization of Scientific Results

REFERENCES

1. Fedchenko V. I., Guriev CO., Semenova N. In. PCR non-invasive prenatal diagnosis of sex. Biomed. chemistry 2005; 51: 527-535.
2. Y. M. D. Lo, N. Corbetta, P. F. Chamberlain et al. Presence of fetal DNA in maternal plasma and serum. Lancet 1997; 350: 485-487.
3. Lo Y. M. D., Zhang J., Leung T. M. et al. Rapid clearance of fetal DNA from maternal plasma. Am. J. Hum. Genet. 1999; 64: 218-224.
4. Tamkovich, S. N., Vlasov V. V., Laktionov p. P. Circulating DNA from blood and their using in medical diagnostics. Molecular biology 2008; 42: 1: 12-23.
5. Chan K.C.A., Zhang J. et all. Size distributions of maternal and fetal DNA in maternal plasma. Clin. Chem. 2004; 50: 88-92.
6. Tokarev A. G., Lebedev I. N. etc. of Extracellular nucleic acids of the fetus in the mother's blood: characterization, origin, and significance for prenatal diagnosis. Medical genetics 2006; 5: 8 (50).
7. Jahr S., Hentze H., Englisch S., et al. DNA fragments in the blood plasma of patients: quantitations and evidence for their origin from apoptotic and necrotic cells. Cance Res. 2001; 61: 1659 – 1665.
8. Nagata S. Apoptotic DNA fragmentation. Exp. Cell. Res. 2000; 256: 12-28.
9. Laktionov P.P. Tamkovich S.N., Rykova E.Yu... et al. Extracellular circulating nucleic acids in human plasma in health and disease. Nucleosides. Nucleotides. Nucleic Acids. 2004; 23: 879-883.

10. Tuaeva N. About. Extracellular DNA and its involvement in the immune response in newborn infants: the abstract Diss. kand. Biol. Sciences. Kazan, 2007.
11. Farina A., Caramelli E., Concu M. et al. Testing normality of fetal DNA concentration in maternal plasma at 10-12 completed weeks gestation: a preliminary approach to a new marker for genetic screening. Prenat. Diagn. 2002; 22: 148-152.
12. Bryzgunova O.E., Skvortsova T.E., Kolesnikova E.V. et al. Isolation and comparative study of cell-free nucleic acids from human urine. Ann. N. Y. Acad. Sci. 2006; 1075: 334-340.
13. Lo Y.M.D., Leung T.N., Tein M.S.C. et al. Quantitative abnormalities of fetal DNA in maternal serum in preeclampsia. Clin. Cem. 1999; 45: 184-188.
14. Li Y., Zimmerman B., Zhong X.Y., et al. Determination of RhD zygosity using real-time quantitative PCR. Swiss Med. Wkly. 2003; 133: 442-445.
15. Farina A., Leshane E. S., Romero R. et al. High levels of fetal cell-free DNA in maternal serum: a risk factor for spontaneous preterm delivery. Am. J. Obstet.Gynecol. 2005; 193: 421-425.
16. Sekizawa A., Jimbo M., Saito H. et al. Increased cell-free fetal DNA in plasma of two women with invasive placenta. Clin. Chem. 2002; 48: 353-354.
17. Шевчук Н.А. Время-разрешенный иммуно-флюоресцентный анализ на ДНК и исследование содержания ДНК в сыворотке человека. Вопр. мед. Химии 2001; 47: 439-448.

18. Gahan P., Swaminathan R. et al. Circulating Nucleic Acids in Plasma and Serum V. -2008. Annals of the New York Academy of sciences. 345
19. Lam N.Y., Rainer T.H., Chan L.Y., Joynt G.M., Lo Y.M. Time course of early and late changes in plasma DNA in trauma patients. Clin. Chem. 2003; 49: 1286 – 1291.
20. Vasilyeva I.N. Low-molecular-weight DNA in blood plasma as an index of the influence of ionizing radiation. Ann. N. Y. Acad Sci. 2001; 945: 221-228.
21. Lam N.Y., Rainer T.H., Chan L. Y., Joynt G.M., Lo Y.M. Time course of early and late changes in plasma DNA in trauma patients. Clin. Chem. 2003; 49: 1286 – 1291.

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SOME INDICATORS OF THE HEALTH STATE OF CHILDREN AND ADOLESCENTS INVOLVED IN SPORTS

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ABSTRACT

Introduction. Sports and physical culture are effective tools for optimization physical activity and health promotion in children and adolescents, which led to a sharp increase in the number engaged sports sections and special schools in all regions of the country. However, only providing that, comprehensive and scientifically sound approach to the management of physical stress and planning of training process of sports can have a positive tendency in the process of harmonious development of the child. **Purpose.** The aim is to study the morbidities of children and adolescents involved in sports. **Methods.** The study involved the enrollment of the College of Olympic reserve of Bukhara, as well as the Republican College of Olympic reserve aged 14 to 19 years. Among the surveyed males 85% (832 people) and females constitute 15% (146 people).

Sport experience of surveyed was on average 7.5 ± 1.35 years. The obtained data were entered into a new model the medical records of athletes. In the evaluation, we proceeded from the methodological recommendations A.V. Stavitskaya and D. I. Aron (1959). In accordance with the age periodization, recommended by the Institute of developmental physiology RAO (1965), the surveyed contingent was divided into three age periods of development: second childhood (10-12 years), teenager (13-15 years) and adolescence (16-19 years). **Results.** From 2011 to 2015, the number of children and adolescents involved in sports increased from 13 to 58.2 %. ENT-organs made up 51% of the total number of morbidity, 8% – with endocrine pathology, 26% with pathology of CNS and VNS, diseases of the eye – 15%. As a result of comprehensive surveys revealed that the number of adolescents is considered healthy 13.4 per cent, 86.4 % of the identified risk factors, they are assigned to individualized treatment plans and recovery. During the check-up of the dentist, 22% of adolescents are in need of rehabilitation. **Conclusion.** Currently, there is a need to revise approaches to the organisation of the process of medical control at the initial stage of training, which should resolve the problem of removal of failings in physical development and preparedness, an increase of interest to physical exercises.

Keywords: Athlete, pathology, sports medicine, pathology of adolescents in sport.

INTRODUCTION

Thanks to the special attention of the government of our country, youth sports have taken a serious pace and momentum in its development over the years of independence. An example of this is the annual growth in the number of children and adolescents, involved in to the sport and the number of sports facilities and specialized sports schools in all regions of the country [1, 2]. The health of the younger generation is a national treasure of the Republic, the preservation and strengthening have become the purpose in the implementation of special government programs in the country in recent year's intensive development. It should be noted that "health is one of the most important components of human happiness, one of the inalienable rights of the human being, one of

the conditions for successful social and economic development of society" [3]. Sports and physical culture are effective tools for optimization of physical activity and health promotion of children and adolescents, which led to a sharp increase in the number engaged sports sections and special schools in all regions of the country, however, only providing that, comprehensive and scientifically sound approach to the management of physical stress and planning of training process of sports can have a positive tendency in the process of harmonious development of the child [4, 5]. High physical and psycho-emotional load on the background processes of growth and formation of organs and systems, make high demands on the organism of young athletes and, under certain circumstances,

can lead to a number of disorders in physical development and health. Early sports specialisation and its attendant intense training and active competitive activities are extremely violating objective laws of long-term perfection, prematurely wearing young athlete and deprives his ability to achieve good results optimally for a particular sports developing sphere [6, 8].

As a result, of studying of contemporary states of youth sport, particularly relevant questions of professional sports selection, condition and prediction of the health of the people, as well as the development of special preventive and rehabilitation measures to maintain and improve the health of future generations. Given the above, increasing the role of proper organization of medical control

and training process of students-athletes [7, 12, 13]. In the framework of the applied project of ADSS 15.27.9 "development of a comprehensive diagnostic program prepathological and pathological states and methods of their prevention in children and adolescents involved in sports" conducted research work towards the integrated and comprehensive surveys of individuals engaged in sport in youth sports schools. One of the objectives is studying the morbidity of this individual and developing programs of prevention [6].

The aim is to study the morbidities of children and adolescents involved in sports.

MATERIALS AND METHODS

Study Design: cross-sectional study of young athletes through interviews, collection of sports history, conducting

anthropometry, somatoscope, functional trials and tests aiming for assessing physical development and functional state of the cardiovascular, respiratory and autonomic nervous systems and inspection specialists (therapist, otolaryngologist, neurologist, endocrinologist, surgeon, dentist and gynecologist). The study involved the enrollment of the College of Olympic reserve of Bukhara, as well as the Republican College of Olympic reserve aged 14 to 19 years. Among the surveyed males 85% (832 people) and females constitute 15% (146 people). Sport experience of surveyed was on average 7.5 ± 1.35 years.

The **obtained** data were entered into a new model the medical records of athletes. In the evaluation, we proceeded from the

methodological recommendations A.V. Stavitskaya and D. I. Aron (1959). In accordance with the age periodization, recommended by the Institute of developmental physiology RAO (1965), the surveyed contingent was divided into three age periods of development: second childhood (10-12 years), teenager (13-15 years) and adolescence (16-19 years).

The results were evaluated using the variation statistics.

RESULTS

The analysis of information on employment by physical culture and sport among children in Tashkent showed the growing popularity of physical culture and sport among young people. In table 1 and in Fig. 1 lists some statistics showing the current situation.

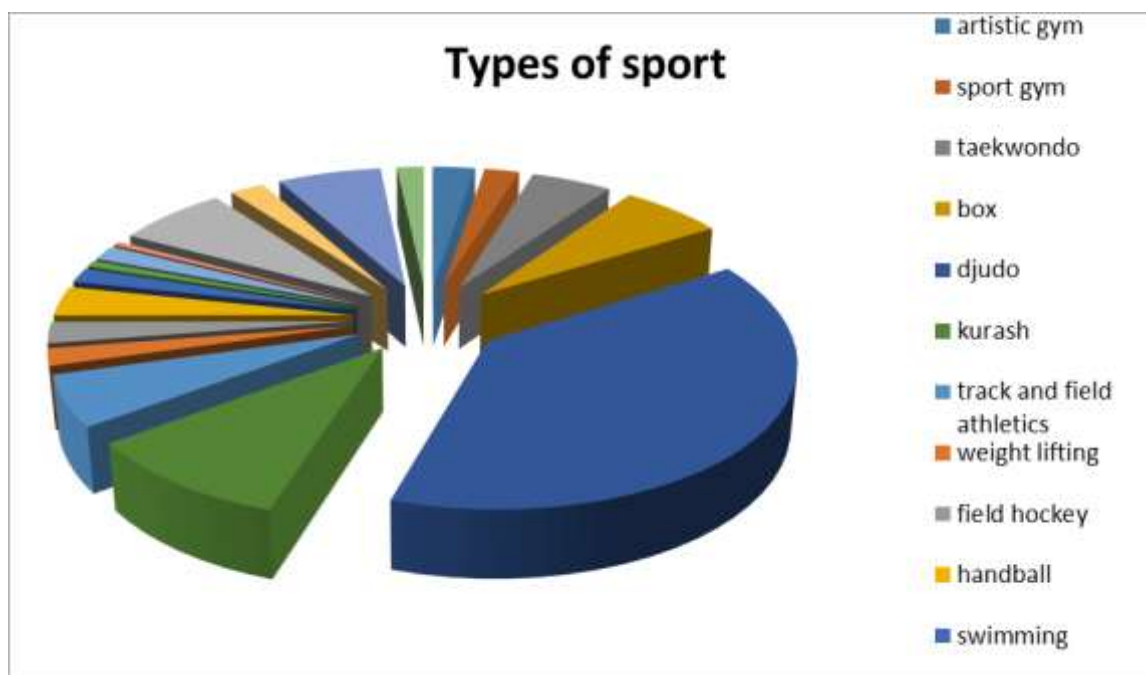
Table 1. The number of children involved in physical activities and sports.

No		April 2014	April 2015
1	Total number of participants at the age of 6-18 in Tashkent city	431234	439770
	Total number of female participants in Tashkent city	206344	208331
	Total number of male participants in Tashkent city	224890	231439
2.	The number of children involved in physical activities and sports	419354 (97,2%)	430547(97,9%),
	Out of them females	192322 (93,2%)	197111(45,8%)-
	Out of them males	217032(96,5%)	233436 (54,2%),
3	The number of children involved in sports	238253 (55,2%)	255874(58,2%)
	Out of them females	109215(52,9%)	117806(46,0%)
	Out of them males	129038(57,4%)	138068(54,0%)

*according to the monitoring data submitted by the children's City medical-sports clinic (2015).

From 2011 to 2015, the number of children and adolescents involved in sports increased from 13 to 58.2 %.

We surveyed the athletes involved in the colleges of Olympic reserve in the following sports:



During the survey specialists of the athletes of teenagers and adolescence in colleges of Olympic reserve of Tashkent city and Bukhara obtained the following results: ENT-organs made up 51% of the total number of morbidity (chronic tonsillitis – 32%, a deviated septum – 12%, chronic Mesotympanitis – 3%, post-traumatic otitis media of 4%), 8% – with endocrine pathology (diffuse goiter, obesity, short stature

syndrome, diffuse goitre with an autoimmune component), 26% with pathology of CNS and VNS (vegetative-vascular dystonia, post-traumatic encephalopathy, logo neurosis), diseases of the eye – 15% (hypermetropia, accommodation spasm, myopia , amblyopia , astigmatism).

From the examined athletes 113 females, age from 14 to 19. Types of sports such as judo, gymnastics, handball, field

hockey, volleyball, basketball, gymnastics, water Polo, swimming, taekwondo, national Kurash, table tennis, tennis, track and field. Conducted an ultrasound examination of the pelvic organs, gynecological examination.

During the obtained analysis data of Urgench total number examined - 73, athletes at age of 16.5 (13-20 years), the predominant sports of judo, rhythmic gymnastics, handball and field hockey. The average age of menarche of 14, 4 (82,2 %), lack 17.8%. (13), have gynecological diseases 33% (24), including dysmenorrhea (50%), amenorrhea of 37.5 %, inflammatory disease 12.3%. The analysis data of Bukhara city received the following information of the average age of the athletes 17 years (13-19) total number

inspected - 41, the predominant sports are gymnastics, handball, hockey and athletics. The average age of menarche 13.5, pathology of the reproductive function, at 46.3%, dysmenorrhea 84.2 %, amenorrhea in 15.8%, hypoplasia of the uterus, chronic adnexitis, delayed sexual development of 6%.

As a result of comprehensive surveys revealed that the number of adolescents is considered healthy 13.4 per cent, 86.4 % of the identified risk factors, they are assigned to individualized treatment plans and recovery. During the check-up of the dentist 22% of adolescents are in need of rehabilitation. The screening system of the heart in pupils of the school showed that one in three has disorders of the cardiovascular system (32.1 %) in 34.6% of cases, in-depth medical

examination of young athletes identified functional abnormalities. From 15.8 % revealed pathology of the digestive system, weight deficit of 12.7 %, the low growth rate of 11.6 %), 5.7% of excess body weight. Almost every third young athlete has the disharmonious physical development (to 31.2 %). It was found that 90.4 percent of the total training duration of young athletes is 9-12 hours per week. In the analysis of the data becomes relevant conducting comprehensive surveys of children and adolescents involved in sports, with the aim of early detection of developing prepathological states and correcting existence of violations in health status. To develop criteria that characterizes the integral health of young athletes it is necessary a comprehensive

system of evaluation and monitoring that allow identifying an age-specific functional status of young athletes and in proper time to differentiate the development of prepathological and pathological conditions.

DISCUSSION

With the aim of reducing, the morbidities of young athletes is necessary to improve the system of medical-pedagogical control in all stages of athletic training. Optimizing the existing program in-depth medical examination and all kinds of medical monitoring of the current individual [6, 7]. It Should be noted that in the process of training there is a contradiction between increasing requirements towards the training of young athletes, dictated by the necessity of postmenopausal results and limited functional capabilities of their growing

bodies [8]. This problem is especially acute in the initial stages of long-term preparation of children and adolescents when the reserves of their organism readily use the natural growth and development and the energetic and plastic provision of specified loads. The situation is compounded by the early specialization in sport, the intensification of training and their negative impact on the human body [9, 11]. Today, it is becoming more unconditionally that the preservation and maintenance of the appropriate level of health of the athletes will contribute to the purposeful inclusion of preventing rehabilitation direction in the multi-year process of preparation of sports reserves the rights of the full-fledged structural component [10].

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CONCLUSION

Currently, there is a need to revise approaches to the organisation of the process of medical control at the initial stage of training, which should resolve the problem of removal of failings in physical development and preparedness, an increase of interest to physical exercises. All this, of course, heightens the need to take drastic measures aimed at the harmonious physical development of young sportsmen compliance with parity preservation of health in the preparation of young athletes.

CONSENT

It is not applicable.

COMPETING INTERESTS

Author has declared that no competing interests exist.

Generalization of Scientific Results

REFERENCE

1. Balsevich, V. K. The Contours of a new strategy for the training of Olympic-class athletes / V. K. Balsevich // Theory and practice of physical culture. 2001. - No. 4. - . 9-10.
2. Volkov, L. V. Theory and methodology of children and youth sports. K.: Olympic literature, 2002. – 296 p.
3. V. M. Volkov, V. P. Filin Sports selection. - M.: Physical culture and Sport, 2003.-175 C.
4. Zavitaev S. P. Health-promoting methods of sports training of young hockey players: abstract dis. Cand. PED. Sciences: 13.00.04 "Theory and methodology of physical education, sports training, improving and adaptive physical culture" / UGAFK – Chelyabinsk, 2004. – 22 p
5. Gorbaneva E. P. Functional properties of athletes' preparedness of different specialization / E. P. Gorbaneva, E. A. Solopova, I. N. Solopov // Issues of functional training in sports and physical education. – Volgograd, 2008. – S. 29-41.
6. Guryanov M. S. Health and Ways of perfection of medical maintenance of pupils of DYUSSH: abstract dis. Cand. med. Sciences. Kazan, 2002. – 24 p
7. Zotkin, V. N. Biomedical foundations of sports selection of players-teenagers: author's abstract of dis. Cand. PED. Sciences: 14.00.51. – "Regenerative medicine, physiotherapy exercises and sports medicine, balneology and physiotherapy", 14.00.09. "Pediatrics" – M., 2004. – 20 C.

8. Maksimenko I. G. Teoretiko-methodical bases of long-term preparation of young sportsmen in sporting games. dis. for obtaining the academic degree doctor of physical vos: spec. 24.00.01. "Olympic and professional sport". – K., 2011. – 46 p.
9. Losev S. I., Borodulin, T. A. The Role of pediatricians in the formation of healthy lifestyle in children and adolescents // Russian journal of Pediatrics. – 2006. – No. 2. – P. 44-48.
10. Matveev L. P. Model-oriented approach to the construction of sports training // Theory and practice of physical culture. - 2000. - No. 2. - S. 28-37.
11. Suslov F. P. Problems of youth sport at the present stage of its development / by F. P. Suslov // Physical culture education, training. – 2008. – No. 3. – Pp. 2-6.
12. Maksimenko I. G. Theoretical methodical bases of long-term preparation of young sportsmen in sporting games are, Kiev, 2011, p 46.
13. Kournikova, M. V. The Morph-functional status of elite athletes in adolescence period: abstract dis. Cand. med. Sciences. – SPb., 2009. – 24 p.

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BELL'S PALSY: CLINICAL FEATURES AND RECOVERY PERIOD AT THE ASPECT OF SEXUAL DIMORPHISM

Manuscript Info Abstract

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Abstract

Aims: The purpose of report is to investigate the clinical features of neuropathy of the facial nerve and recovery period of facial nerve depending on the affected side, and gender.

Place and Duration of Study: The department of neurology and Medical genetics, Bukhara State Medical Institute, between 2013 and 2015.

Methodology and study design: In this study, we bring forth the results of the frequency and left or right sidedness of lesion of facial nerve neuropathy based on age and recovery period. A clinical study of 50 patients with facial palsy in the acute period was conducted: 23 (46%) males, 27 (54%) women. Ranged in age from 15 to 74 years

Result: The results showed that light and medium courses of the disease are often noted in men. Complications are observed only in severe cases. The recovery of the facial nerve within up to 1 month occurs at medium degree of the disease, since light degree of the disease dominates for women in this period, and medium severity is maintained until the period of complications. It is evident that men having a slight lesion of the

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facial nerve recover mainly within 1 month, while recovery of women's facial nerve takes a long time.

Conclusion: idiopathic neuropathy facial nerve as a whole is found in people under the age of 45 years old three times more often than in older and younger ages. There are no special differences in lateralization of the process.

Clinic of lesion of the left side in men is often characterized by severe course and complications in the form of contractures of different types.

The disease in women often has a prolonged duration, which may be explained with the psycho-emotional factor and requires further study of psycho-vegetative status of patients with neuropathy of the facial nerve.

Restoration of facial nerve depends on the severity of the disease, the degree of damage, the deeper the lesion, the longer the recovery takes. Since in most cases the facial nerve nln is completely restored within 3-4 months, it can be assumed that the average recovery duration is 50-60 days in medium and heavy cases.

Keywords: bell's palsy, cranial nerve, facial palsy, facial nerve, recovery time.

INTRODUCTION

Bell's palsy is the most common acute facial paralysis with its causes still unclear. At present, the most widely accepted causes are viral infections, trauma, surgery, diabetes, local infections,

tumor, immunological disorders, or drugs. Unclear causes lead to unidentified treatments. Most therapeutic methods are simply symptomatic treatment.

The facial nerve is one of the youngest cranial nerves, and thus

easily offended. For people it plays one of the main roles. The main activity of the nerve is innervation of facial muscles: we owe it the ability to smile and frown, to surprisedly raise eyebrows and to wrinkle nose.

According to the who bell's palsy is the most common type of mononeuropathy and ranks second in frequency among the diseases of the peripheral nervous system and the first among the lesions of the cranial nerves. The incidence ranges from eight to 240 cases per 100 thousand of people in different countries of the world. The frequency of neuropathies of the facial nerve is, for example, in Uzbekistan 38-40 cases, in the European countries 20 cases, in japan 30 cases per 100 thousand. Full recovery from paralysis of facial muscles occurs in 55% of cases, partial – in 40%. 5% of

patients do not recover. In 10% of patients, neuropathy of the facial nerve recurs.

NFN does not always lead to disability; however, the cosmetic defect, which remains for life, has a psycho-traumatic effect on the patient, especially on the life style of patients (such as communication, training etc.) in addition, it reduces quality of life.

Abu Ali Hussein ibn abdullah ibn sino, known as Avicenna, made the first description of facial palsy many centuries earlier (980– 1037). In 1550, fallopius noted the narrow foramen in the temporal bone through which a part of the seventh cranial nerve (facial nerve) passes; this feature is now sometimes called the fallopian canal or the facial canal. In 1828, Charles bell made the distinction between the fifth and seventh

cranial nerves; he noted that the seventh nerve was involved mainly in the motor function of the face and that the fifth nerve primarily conducted sensation from the face.

Factors contributing to provoking the tunnel compression are diverse, including vasomotor regulation, sensitization, and toxic obstipation moments. However, according to some authors, the original anatomic features play an important role, structure of fallopian channel having a unique feature. For each patient in particular, fallopian congenital narrowness of the channel plays a certain role in the repetitive genesis of idiopathic neuropathy of the facial nerve. On this basis 1 might think that the anatomical and physiological characteristics of the fallopian channel of males and females also differ, which

may underlie features of frequency, left or right sidedness, as well as clinic course and character of complications (contractures) of persons, male and female. In this respect, an important role is also played by the nature of psycho-vegetative reactions to the disease in the aspect of sexual dimorphism.

1. MATERIAL AND METHODS

In this study, we bring forth the results of the frequency and left or right sidedness of lesion of facial nerve neuropathy based on age and recovery period. A clinical study of 50 patients with facial palsy in the acute period was conducted: 23 (46%) males, 27 (54%) women. Ranged in age from 15 to 74 years, to 20 years eight (16%), 21-45 years of age - 32 (64%), 46-59 years - 6 (12), 60-74 years - 4(8%) patients (table 1).

On the etiology of the disease all patients was defined as idiopathic neuropathy (Bell's palsy). According to the degree of severity of the disease, the patients were divided into 3 groups: neuropathies mild degree, medium degree, and with severe neuropathies. The severity of

clinical manifestations of prosoparesys was classified on a 5-point system proposed by S. J. Balaban.

The severity of clinical manifestations of prosoparesys can be classified on a 5-point system proposed by S. J. Balaban.

Studies of facial expressions	4 points	3 points	2 points	1 point	0 points
narrow eyes	++	+	Sclera 1-2 MM	Sclera 3-5 MM	
The symptom of eyelashes	-	+	-	-	
Symptom Bell	-	-	+	+	
Frown and the raising of the eyebrows	+++	++	+	-	
Teeth	4-5 teeth	3-4 teeth	2-3 teeth	1-2 teeth	
Whistle	++	+	-	-	
Bombast	+++	++	+	-	
Latent time in electroneuromyography	4,5-5ms	5,0-5,5ms.	5,5-6,0 ms	more 6 ms.	missing

RESULTS AND DISCUSSION.

Analysis of the division of patients with facial nerve neuropathy according to sex and

age indicates the predominance of middle-aged (21-45) and male. (fig.1)

Division of patients by gender and age (%) (tab.1)

Age	Men %	Women %	All patients %
16-20	13,0 ± 4,9	18,6±5,3	16,0±3,7
21-45	69,6±6,8	59,2±6,7	64,0±4,8
46-59	8,7±4,1	14,8±4,8	12,0±3,2
60-74	8,7±4,1	7,4±3,6	8,0±2,7
Alltogether	100,0	100,0	100,0

In addition, taking into account the affected side depending on the gender, the degree of severity of the disease was determined. Tab. 2 shows that, in men, the lesion of the right side of the face is noted more

often, as left-sided lesion mainly continues with severe prosoparesys.

Number of men and women according to location of the palsy and the severity of the disease (tab.2.)

Degree the severity of the disease	Man %			Woman %		
	Right side	Left side	All	Right side	Left side	All
Light	18,2±7,2	0	8,7±4,1	18,7±6,9	18,2±7,2	18,5±5,3
Medium	27,3±8,5	25,0±7,8	26,1±6,5	25,0±7,6	27,3±8,5	25,9±5,9
Severe	54,5±9,6	75,0±7,8	65,2±7,0	56,3±8,7	54,5±9,6	55,6±6,8
Alltogether						

	100,0	100,0	100,0	100,0	100,0	100,0
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Among facial palsy patients the ones with lesions of the right side of face made up 27 patients, 11 patients(40%) males, 16 (60%)women, left-sided lesion - 23, 12(52%) men and 11 (47%)women. In addition, the period of recovery of the facial nerve was analyzed, considering the severity of the disease. In the period of up to 1 month, the recovery of the nerve occurred in 12 (24%) patients, which mainly belonged to the group of patients

with light course of the disease. In the period of up to 4 months the facial nerve recovered in 30 (60%) patients, and in the period of more than 4 months in 8(16%) patients, however the restoration of the facial nerve occurred partially with complications of contractures of different types.(tab 3)

Period of recovering from facial palsy depending on degree of severity in men and women (tab 3)

The degree of damage	Men %				Women %			
	till 1 month	till 3-4 month	more 4 month	all	till 1 month	till 3-4 month	more 4 month	Alltogether
Light cours	33,3±12,5	0	0	8,7±4,1	50,0±5,8	11,1±5,2	0	18,5±5,3
Medium course	66,7±12,6	16,7±6,6	0	26,1±6,5	50,0±5,8	16,7±6,2	33,3±18,2	25,9±5,7
Severe course	0	83,3±6,6	100,0	65,2±7,0	0	72,2±7,5	66,7±18,2	55,6±6,8
Alltogether	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

The results showed that light and medium courses of the disease are often noted in men. Complications are observed only in severe cases. The recovery of the facial nerve within up to 1 month occurs at medium degree of the disease, since light degree of the disease dominates for women in this period, and medium severity is maintained until the period of complications. It is evident that men having a slight lesion of the facial nerve recover mainly within 1 month, while recovery of women's facial nerve takes a long time.

In few cases, the medium course takes a long time and is complicated by the contractions of facial muscles. We explain it with the psycho - vegetative status of the patients that requires further investigation of the psychoemotional sphere and

vegetative system in patients with neuropathy of facial nerve.

CONCLUSION

Idiopathic neuropathy facial nerve as a whole is found in people under the age of 45 years old three times more often than in older and younger ages. There are no special differences in lateralization of the process.

Clinic of lesion of the left side in men is often characterized by severe course and complications in the form of contractures of different types.

The disease in women often has a prolonged duration, which may be explained with the psycho-emotional factor and requires further study of psycho-vegetative status of patients with neuropathy of the facial nerve.

Restoration of facial nerve depends on the severity of the

disease, the degree of damage, the deeper the lesion, the longer the recovery takes. Since in most cases the facial nerve NLN is completely

restored within 3-4 months, it can be assumed that the average recovery duration is 50-60 days in medium and heavy cases.

References

1. Гречко В.Е., Степанченко А.В., Турбина Л.Г., Семенова С.Ю. Современные аспекты реабилитации больных с невропатиями лицевого нерва // Неврологический вестник. - 1994. - Т. XXVI, вып. 3-4. - С.45-48
2. М.Н. Пузин, А.И Степанченко, Л.Г.Турбина, А.И. Цуников, Г.М. Настеренко. Нервные болезни. Москва Медицина 1997.
3. Dj. Brilman, S. Koen Nevrology. Medpress.- inform, 2007
4. Alvarez V, Dussoix P, Gaspoz JM. Facial palsy: diagnosis and management by primary care physicians Rev Med Suisse. 2009 Jan 28;5(188):258-62.
5. Gilchrist JM. Seventh cranial neuropathy. Semin Neurol. 2009 Feb;29(1):5-13. Epub 2009 Feb 12.
6. Tiemstra JD, Khatkhate N. Bell's palsy: diagnosis and management. Am Fam Physician. 2008 Aug 1;78(3):316; author reply 319-20.
7. Tucker H.M., Nose Y. Fine control of reinnervated muscle. Dynamic rehabilitation of facial paralysis //ASAIO Transactions. 1999. Vol. 35 (3). P. 484-486.

8. Пшук Я.И., Чечельшцкая-Медведь Е.А. Паралич Белла (этиология, патогенез, клиника, течение, исход) // Журнал неврологии и психиатрии им. С.С. Корсакова. 1998. Т. 78. № 6. С. 837–845.
9. Никифоров А.С., Гусев Е.И. Клиническая неврология: руководство для врачей. М.: Медицина, 2009.
10. Jackson C.G., Von Doersten P.G. The facial nerve. Current trends in diagnosis, treatment, and rehabilitation // Medical Clinics of North America. 2011. Vol. 83 (1). P. 179–195.

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FUNCTIONAL SONOGRAPHY IN DIAGNOSTICS OF MANDIBULAR FRACTURES

Abstract

The purpose of the study is to assess the possibilities of sonography in the diagnosis of fractures of the mandible using a functional test with the opening and closing of the mouth.

Materials and methods: 96 patients, aged from 6 up to 59 years were examined, 56 of them had fractures of the mandible. X-ray films, MSCT scans were taken for all patients and were compared with the ultrasonographic findings.

Results: All patients showed one or two-sided fracture of the mandible. Fractures of the mandible were combined with injuries of the middle zone of the face in 4 cases. Isolated fractures of the mandible were detected in 17, and multiple fractures in 35 patients.

Among fractures of the mandible prevailed fractures of the angle (in 22), the articular process (in 16), parasymphysis (in 19), the branch (in 11), the corpus (8), the coronoid process (in 3), the symphysis of the mandible (in 6 cases).

MSCT revealed 82 mandibular fractures, X-ray 77, and sonography 80, the sensitivity of the latter two methods was 93.9% and 97.5%, respectively. In 13 cases of unbiased fractures, when difficulties arose, the technique of functional sonography with opening and closing of the mouth was used. In addition, 11 more fractures were revealed using this technique.

In 34 patients, there was a need for repeated sonography to assess the state of bone fragments after repositioning. The state of the fragments was satisfactory at 19 and unsatisfactory in 15 cases. In 2 patients, sonography was used intraoperatively to assess the adequacy of bone fragments during reposition of the mandible.

Conclusion: On sonograms, fractures of the mandible are manifested by interrupting the outer cortical layer with or without displacement of bone fragments, displacement of bone fragments when using functional loads; dislocation of the head of the articular process by the absence of its contour in the projection of the joint fossa.

The use of sonography with functional tests on the mandible increases the sensitivity of the method in the diagnosis of fractures.

Ultrasonic monitoring of the adequacy of open and closed reposition of fragments improves the effectiveness of interventions and allows timely elimination of the causes of unsatisfactory standing of fragments.

Key words: fractures, mandible, sonography

Currently, the problem of injuries of the mandibular does not lose its relevance - over the past 10 years, the structure of injuries has become more complex and difficult. This is explained by the extensive and combined nature of the damage to this area as a result of increased domestic, transport, explosive and gunshot wounds [1,2]. Among the affected, the persons of working age are predominate (in the range of 20 to 50 years), which also points to the importance of the problem.

Disability for this type of injury reaches 23.5% [3,10]. Craniofacial fractures account for about 40% of the total number of injuries according to the WHO data from 2013, 3.5-8.0% of them account for the damage to the maxillofacial region (MF) bones. At the present stage of the development of maxillofacial surgery, there is an important question about the diagnosis and treatment of patients with posttraumatic defects and deformities of the facial skeleton. The number of

these patients has increased in recent years to 20-25%. It becomes obvious that it is necessary to accurately diagnose damage to the bones of the middle zone of the face with the choice of the most sensitive ray technique both at the pre- and postoperative period [4, 7].

The purpose of the study is to assess the possibilities of sonography in the diagnosis of fractures of the mandible using a functional test with the opening and closing of the mouth.

Materials and methods

96 patients, aged from 6 up to 59 years were examined, 56 of them had fractures of the mandible. X-ray films, MSCT scans were taken for all patients and were compared with the ultrasonographic findings. The control group consisted of 20 people without a trauma of the

mandible, which was performed only by sonography.

A SLE-501 (Lithuania) ultrasound system with a 7.5 MHz linear transducer was used. The patient's was being examined in the supine position, the probe was situated over the fractured bone polypositionally to take longitudinal and transverse sections. The same procedure was carried out for the opposite side. Sonography was used before the operation to clarify the diagnosis and in the early postoperative period to assess the quality of the reposition. In 13 patients, the study was performed using a functional test on the lower jaw, in the positions of opening and closing the mouth. At the same time, the transducer was placed on the investigated area and the patient was given the commands: "open your mouth", "close your

mouth", continuously exploring this area in real time. Sonographically, the diagnosis of a "fracture" was set by interrupting the cortical layer of the bone with or without displacement of bone fragments, deformation of the bone when using a functional test.

All patients underwent x-ray examination using the EDR-750 (Medicor, Hungary) in special projections (in the direct and lateral projections) and multislice computed tomography on the "Somatom Emotion 6" (Siemens, Germany) in an axial projection followed by a three-dimensional reconstruction.

In sonography, the following anatomical structures were evaluated: skin, subcutaneous fatty tissue, masticatory muscles, cortical layer of bones - lateral, medial walls and lower contour of

orbit, nose bones, anterior, maxillary sinus, zygomatic arch and mandible. These structures were also evaluated at MSCT, in addition, changes of deeply located bone and the soft tissue structures of maxillofacial area were estimated, such as the muscles of the hyoid bone, the muscles constituting the mouth aperture, lateral and medial pterygoids.

Ultrasound visualization of this structures is complicated because of possible artifacts from adjacent bone structures.

MSCT was also chosen as reference method for evaluating the diagnostic efficacy of sonography and radiography in detection of injuries of the maxillofacial region

Results

All patients showed one or two-sided fracture of the

mandible. Fractures of the mandible were combined with injuries of the middle zone of the face in 4 cases. Isolated fractures of the mandible were detected in 17, and multiple fractures in 35 patients.

Among the sonographic signs of fractures of the bones of the maxillofacial area, both direct and indirect signs of a fracture were noted. Sonographically, the direct signs of a fracture were observed as follows: the presence of a fracture line, deformation of the contour, displacement of bone fragments, the presence of a fragment; Indirect signs: enlargement of the joint junction of the TMJ, "empty articular cavity", bruise and soft tissue damage. In some patients, the signs of a fracture like a break in

the cortical layer, deformation of the bone contour were manifested in functional sonography with opening and closing of the mouth. Contusions of soft tissues were manifested by their thickening, a decrease in echogenicity with fuzzy counters; Subcutaneous hematomas in the form of hypo- and anechogenous areas with clear counters.

Among fractures of the mandible prevailed fractures of the angle (in 22), the articular process (in 16), parasymphysis (in 19), the branch (in 11), the corpus (8), the coronoid process (in 3), the symphysis of the mandible (in 6 cases).

Table №1 Frequency of determination of fractures of the mandible by methods of visualization.

Fractures detected by MSCT	Number of fractures	Radiologically detected	revealed in sonography
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Articular, coronal and alveolar processes	16	11	16
angle	22	22	21
Body, branch	19	19	18
Symphysis and parasymphysis	25	25	25
Total fractures	82	77	80

MSCT revealed 82 mandibular fractures, X-ray 77, and sonography 80, the sensitivity of the latter two methods was 93.9% and 97.5%, respectively. At the same time, in the fractures of the angle, body, symphysis, and

parasymphysis of the mandible, the sensitivity of both radiography and sonography remained high and approximately the same, but differed greatly in fractures of the joint and coronary processes of the mandible.



Fig. 1a. Patient N., 26 y.o. Sonogram of the right branch of the mandible. Signs of traumatic bone damage are not detected.

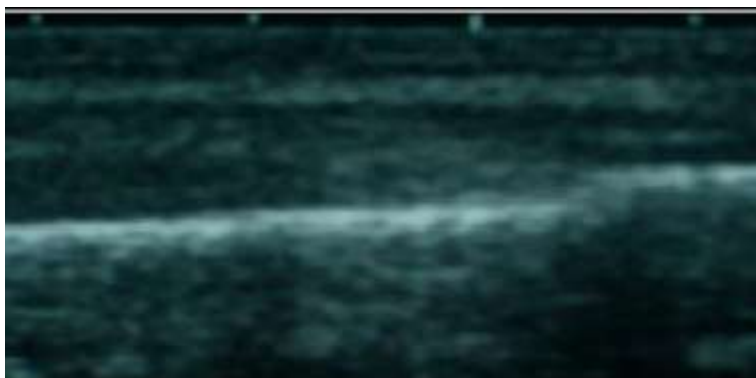


Fig.1b. Sonogram of the right branch of the same patient, received with a functional load with the opening of the mouth. Interruption of the cortical layer with a slight displacement of bone fragments (arrow) is noted.

In 13 cases of unbiased fractures, when difficulties arose, the technique of functional sonography with opening and closing of the mouth was used. The functional test revealed interruption of the outer cortical layer with a slight displacement (by 1-2 mm) of the cortical ends (Fig. 1a, b In addition, 11 more fractures were revealed using this

technique (Figures 2a, b), but did not reveal fractures in 2 patients at the branch ($n = 1$) and mandibular angle ($n = 1$) levels. On computer tomograms, these observations revealed an incomplete fracture of the inner cortical layer of the bone. It should be noted that there are objective difficulties in ultrasound investigation: bone tissue is a natural obstacle for the passage of ultrasound and therefore only the contour of the bone facing the sensor can be visualized, while the inner contour of the cortical layer cannot be visualized at the same time.

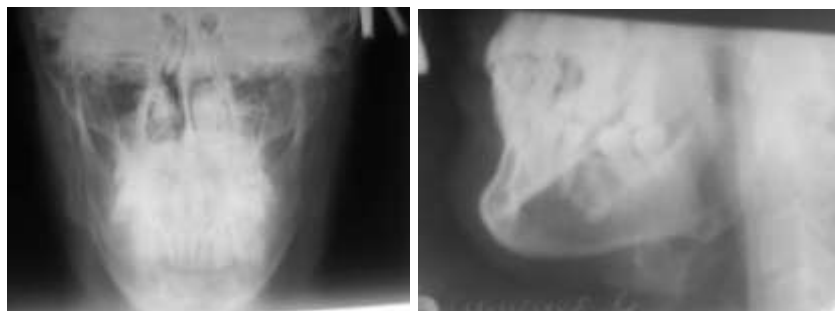


Fig. 2a. Patient M., 37y.o. On the x-ray of the mandible in the direct and lateral views fractures of the mandible is not revealed.

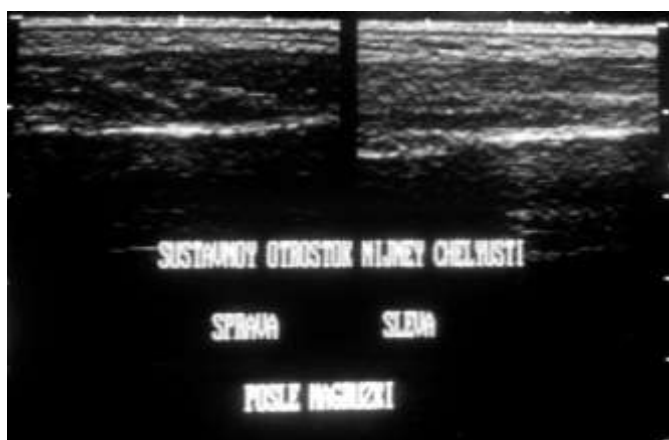


Fig. 2b. Sonogram of articular processes of the same patient, received with a functional load with the opening of the mouth. Interruption of the cortical layer with a slight displacement of bone fragments (arrow).

IN formativeness of radiography and sonography in revealing fractures of articular and coronal processes was not the same, a small number of false-

negative conclusions were obtained by X-ray examination. In the X-ray study, unidentified injuries of the mandible were in 5 cases, in particular, at the levels of the coronal ($n = 3$) and articular ($n = 2$) processes. In addition, the front dislocations of the head of the articular process were not detected in two cases. The cause of the difficult diagnosis of a fracture during X-ray examination is the

affected anatomical structure and a possible layering of the shadow of the bones.

Sonography was also used after splinting teeth in order to study the state of bone fragments. In 34 patients, there was a need for repeated sonography to assess the state of bone fragments after repositioning. The state of the fragments was satisfactory at 19 and unsatisfactory in 15 cases. The cause of unsatisfactory standing bone fragments was the interposition of soft tissues between fragments.

In 2 patients, sonography was used intraoperative to assess the adequacy of bone fragments during reposition of the mandible. The intraoperative use of ultrasonography to control the quality of reposition further enhances the significance of the method.

Discussion

The results of our examination showed that the use of sonography in patients with injuries of the maxillofacial region improves the detectability of fractures in the facial skull bones, which is due to the greater sensitivity of sonography than X-ray. However, the specificity of sonography is much lower than the radiography. According to our data, the sensitivity of sonography was high for fractures of the mandible (94%) and depended primarily on the fracture region, character of the fracture or displacement of the fragments. The causes of false negative results were fractures without displacement of fragments, with minor damage to the cortical layer, small fracture size, inaccessibility for ultrasound

imaging and the presence of subcutaneous emphysema.

Studies have shown that sonography cannot replace radiography, but it should be an obligatory component of a primary examination of a patient with suspected traumatic injuries to the maxillofacial region; especially since this study was the widespread and affordable. For example, in Uzbekistan, the department of emergency medical care of all, without exception, district and city hospitals are equipped with separate ultrasonic scanners.

CONCLUSION:

1. On sonograms, fractures of the mandible are manifested by interrupting the outer cortical layer with or without

displacement of bone fragments, displacement of bone fragments when using functional loads; dislocation of the head of the articular process by the absence of its contour in the projection of the joint fossa.

2. The use of sonography with functional tests on the mandible increases the sensitivity of the method in the diagnosis of fractures.

3. Ultrasonic monitoring of the adequacy of open and closed reposition of fragments improves the effectiveness of interventions and allows timely elimination of the causes of unsatisfactory standing of fragments.

References

1. Boymuradov Sh.A. Early diagnosis and treatment of combined cranioabdominal injuries // Doctor's bulletin.- 2016.-№1.P. 3-5
2. Khodjibekov M.X., Azimov A.A. Sonography in the diagnosis of injuries of the maxillofacial region. Bulletin of rentgenology and radiology, 2012, T.1, C.10-15.
3. KS Singh, S Jayachandran. A comparative study on the diagnostic utility of ultrasonography with conventional radiography and computed tomography scan in detection of zygomatic arch and mandibular fractures // The American Journal of Emergency Medicine, 2014, Vol. 5. № 2, P. 166-169
4. Sreeram MP, Rupesh Mandava, Ravindran C, Elengkumaran. Use of ultrasound as a screening tool in the maxillofacial fractures // International Medical Journal, 2016, Vol. 3. №6, P.573-577
5. Boymuradov Sh.A. Damage to the walls of the orbit with combined injuries of the bones of the facial skeleton. // Stomatologiya-2011.-№3-4.- P.31-34.
6. Kokemueller H, Tavassol F, Ruecker M, Gellrich NC: Complex midfacial reconstruction: a combined technique of computer-assisted surgery and microvascular tissue transfer. J OralMaxil-lofac Surg 2008.
7. Babkina TM, Demidova E.A. Modern approaches to the diagnosis of injuries of the maxillofacial region // REJR. -2014.
8. Pi-Yun Chiu, Jen-Darchen, Ping-Yi Ko, Cheng-Yenchang Clinical Assessment of the Diagnostic Value of Facial Radiography in Facial

Trauma Patients at the Emergency Department // Chin Journal of Radiol, 2005, Vol. 30, P. 327-333

9. Gorgu M. Prospective comparative study of the range of movement of temporomandibular joints after mandibular fractures: rigid or non-rigid fixation / 2002.

10. Pavlova O.Yu., Serova NS, Medvedev Yu.A., Petruk P.S. Radiodiagnosis of injuries of the bones of the middle zone of the face. Russian electronic journal of radiology, 2014. T. 4. № 3, P 39-44.