

базисное лечение препарат сульфат железа с дополнительным назначением внутрь препарата кверцетина и контрольную группу - 15 больных (n = 15), принимавших базисное лечение. Группу сравнения составили 10 женщин (n = 10) больных ЖДА без ОЖ на базисном лечении. Оценивали показатели гемограммы и качество жизни по опроснику SF-36. Все пациенты женского пола со средним возрастом $40,3 \pm 7,59$ лет. При распределении больных по причине возникновения и степени тяжести ЖДА установлено отсутствие достоверной разницы между группами. В процессе лечения было отмечено достоверное различие показателей по шкалам ролевое физическое функционирование (РФФ) и жизнеспособность (Ж) на 60 ± 3 день в основной группе по сравнению с контрольной группой ($p < 0,05$) при отсутствии расхождения с группой сравнения ($p > 0,05$). Вывод. Включение кверцетина в комплекс лечения железодефицитной анемии с ожирением улучшает физический компонент здоровья качества жизни по шкалам РФФ и Ж опросника SF-36 у женщин больных железодефицитной анемией с ожирением.

Ключевые слова: железодефицитная анемия, ожирение, качество жизни.

Стаття надійшла 6.11.2017 р.

additional oral administration of quercetin and a control group of 15 patients (n = 15) who received baseline treatment. The comparison group consisted of 10 women (n = 10) of patients with IDA without O on baseline treatment. Evaluated hematological parameters and QOL by questionnaire SF-36. All patients were females with an average age of 40.3 ± 7.59 years. In the distribution of patients by the cause and the severity degree of IDA, there is no probable difference between the groups. In the course of treatment, a significant discrepancy of the indicators on the role of physical functioning (RFF) and viability (G) scales was noted for 60 ± 3 days in the main group compared to the control group ($p < 0,05$), in the absence of any discrepancy with the comparison group ($p > 0,05$). Conclusion. Incorporation of quercetin into a complex of treatment of iron deficiency anemia with obesity improves the physical component of quality of life quality on the scales of the RFF and G the SF-36 questionnaire in women with iron deficiency anemia with obesity.

Key words: iron deficiency anemia, obesity, quality of life.

Рецензент Скрипник І.М.

DOI 10.26724 / 2079-8334-2017-4-62-66-71

UDC 618.1 – 06:616.441- 036.21]-02

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THE INFLUENCE OF GOITROGENS AND ENVIRONMENTAL FACTORS ON THE REPRODUCTIVE SYSTEM OF WOMEN WITH ENDEMIC THYROID DISEASES

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To study the dynamics of growth and prevalence of thyroid diseases during pregnancy, childbirth and the postpartum period in women under the influence of endemic iodine deficiency and anthropogenic factors. The analysis of morbidity among pregnant women, complications in childbirth in women of Western Ukraine. The study indicates that the prevalence of endemic goiter in seven regions of Western Ukraine during the gestation period is in direct proportional connection not only with natural iodine deficiency. Special attention is paid to the impact of technogenic pollution, additional goitrogens, iodine radioactive isotopes on thyroid gland morbidity. These findings suggest the need for an integrated approach to the wide prevention of thyroid gland pathology and the systematic monitoring of its effectiveness for improving the reproductive health and reducing perinatal complications.

Key words: endemic, environmental, radiation factors, iodine deficiency, thyroid homeostasis, goiterogenesis, pregnancy, prevention.

There have been considerable signs of worsening of the reproductive health in the last decade as a result of a number of environmental factors, 'endocrine disruptors' - exogenic compounds that lead to changes in the balance of thyroid hormones because of the thyroid gland dysfunctions, which in their turn cause the disorders of hypothalamic-pituitary axis, the formation of hormone-dependent diseases, significantly affect the quality of health of a pregnant woman and cause perinatal complications. The range of manifestations of iodine deficiency thyropathy in women of reproductive age includes the development of goiter, anemia, infertility, miscarriage, pre-eclampsia, complications during childbirth, the risk of having a child with endemic cretinism [14, 15].

The role of frequency of endemic thyropathy on the basis of iodine deficiency determines the importance of the research of the indicated pathology especially in the absence of the systematic monitoring of iodine supply of pregnant women and the influence of goitrogens of high levels and their negative effects on the health of a pregnant woman, fetus and a newborn child [5].

The increasing needs for thyroid hormones occur in the early stages of adaptation to any negative factors. The critical concentration of any substance can start a reaction of a nonspecific adaptation in the thyroid system, acting as a goitrogen. On the other hand, goitrogens include substances that prevent the intake of iodine in the body and the thyroid gland which make the synthesis of thyroid hormones more difficult and violates the thyroid regulation. In these cases the goitrogenic effect is also a result of participation of the thyroid system in the regulation of adaptation of a specific nature [16].

Today the natural iodine deficiency is increasing under the adverse impact of ecopathogens. The contamination of the environment by the industrial waste, which makes the intake of iodine in the thyroid gland difficult, blocks the enzymes necessary for the synthesis of thyroid hormones, facilitates the accumulation and worsening of the relative deficiency of iodine. The chemical pollutants can disrupt the internally thyroid synthesis of iodine thyronines in peripheral tissues, affect nuclear receptors of cells to thyroid hormones. Such aggressive action has fluoride, lead, phosphorus, nitrites, substances that block the thiol groups [4, 12]. To the natural goitrogenic factors belong: organic sulphides (thiocyanates, isothiocyanate, disulfide), flavonoids, polyhydroxyphenols, pyridine, phthalates, inorganic iodine and lithium in excess. It is believed that technogenic toxicants deepen the manifestations of iodine-selenium deficiency and cause the variations of the pathology of the thyroid gland [7]. Among the external goitrogenic factors radionuclides occupy an important place in the thymus transformation of the thyroid gland. Radionuclides in particular pollute the environment because of accidents at nuclear power stations [12]. Many researchers believe that goitrogenic factors (companies of oil mining and refining, pulp and paper industry) play a certain role in the pathogenesis of thyropathy. According to the mechanism of their action they can be roughly divided into three groups: factors that increase the iodine deficiency in the body and the thyroid gland; factors that make the synthesis of thyroid hormones difficult, and factors that increase the body's need for thyroid hormones [9].

The occurrence of the thyropathy is associated with the possible impact of monotonous food and malnutrition. The deficiency of proteins and vitamins in food is of particular importance [3].

The pregnancy itself often acts as a factor that triggers the development of many thyroid diseases. In regions of iodine deficiency it is, above all, the formation of euthyroid goiter [8]. The goiter which occurs during pregnancy, after childbirth is not always subjected to the reverse development, hence the high prevalence of thyroid pathology among women.

Autoimmune processes in the thyroid gland are provoked by environmental pollutants, urea, detergents, synthetic agents that damage the membrane of thyroiditis and facilitate the access of thyroglobulin into blood [1]. The pathogenic mechanisms mentioned above, being connected with the action of xenobiotics on biological membranes, are manifested in the form of inhibition or activation of enzyme systems and spread on numerous vital enzymes of tissue respiration, bioenergetics, detoxification of antioxidant defence, lipid peroxidation, which is especially important during pregnancy [6]. Despite the apparent scope of the problem there is not any complete scientific and practical analysis, especially there are no fundamental long-term programs of prevention of iodine deficiency at the national level [7].

It is known that the prevalence of endemic thyropathy and its severity is connected with the insufficient intake of iodine, but the action of the main etiological factor may be decreased under the influence of the quality of food, water, conditions and locations, the presence of xenobiotics of anthropogenic origin (industrial toxicants, pesticides), disbalance of micro- and macro-elements that lead to the violation of iodine intake by cells of the thyroid gland. Under the conditions of iodine deficiency a special effect has the ionizing radiation, which stimulates proliferative processes in the thyroid tissue, activates the toxic products of lipid peroxidation and inhibits the body's antioxidant defence system [1, 6]. In Western Ukraine, which according to the development of goiter transformations refers to the iodine deficiency endemic region, the situation is becoming worse due to the adverse environmental factors, the pollution of the biosphere by radionuclides, industrial waste, which contains goitrogenic properties and increases the body's allergy [10, 11]. What matters is the fact that during the last two decades the nature of nutrition has changed greatly. The contamination of food with radionuclides, a lack of chemical composition of the local food, people's self-limitation of the consumption of iodine-containing food, the worsening of the economic situation and the purchasing capacity of citizens led to a significant deformation of a food diet that together with the effect of toxic substances (nitrates, nitrites, pesticides, industrial and transportation poisons), ionizing radiation and emotional stress have led to the increase of overall morbidity, especially women during the gestation period in regions with endemic iodine deficiency and in areas affected by radioactive iodine as a result of the Chernobyl accident [12].

The normal functioning of the thyroid gland in women during pregnancy and breastfeeding is essential for a healthy childbirth and a subsequent normal development of a baby. Under the conditions of iodine deficiency the functional activity of the thyroid gland of a mother and a fetus is decreased which increases the risk of having a disabled child [16]. A mother's body is the only source of the intake of this microelement to the fetus, and the sufficient iodine intake by pregnant women is of particular importance. Breast milk at an early age period is the only food for children, so the presence of the sufficient amount of nutrients and microelements is necessary. The iodine intake by a pregnant woman as well as a breastfeeding mother is a profound factor for the normal development of a child, but the elimination of a lack of one

microelements does not solve the problem of the quality improvement as the iodine deficiency is combined with a shortage of selenium, iron, zinc and other microelements that take part in ensuring the thyroid gland functioning. The lack of selenium consumption leads to a selenium deficiency goiter. Low levels of selenium intake are observed in regions with the iodine deficiency, so it is advisable to enrich food with at least several microelements [13, 14].

The harmful effect on the health of a pregnant woman is able to cause not only the insufficient natural intake of microelements, but the contamination of soil and water sources by chemicals and the iodine deficiency in soils and groundwater. The defining components of the iodine deficiency is an altitude, a distance from the sea and a degree of podzolic soil, but the presence of iodine deficiency is described mainly in Crimea [3]. It should be taken into consideration that the iodine content in groundwater is a measure that affects iodine in food grown in the area, causing the migration of microelements in the system 'soil – plant'. A small amount of iodine in water indicates the unfavorable local conditions that can cause the iodine endemic and the indicator of iodine in water is causing anxiety [5]. According to V.I. Botsyurko's research and his co-authors the average iodine content in groundwater in Western Ukraine ranges from 0.4 to 5 mg/l [2]. Studying the average content of goitrogenic factors: boron, chromium, zinc, manganese, magnesium, molybdenum, cobalt, selenium, copper, soluble iodine in the arable soil layer, the average degree of mineralization and water hardness V.I. Pankiv showed the cause-effect relationship with the level of thyroid pathology morbidity of various forms. The smaller the concentration of iodine in water sources is, the higher level of endemic thyropathy morbidity [7].

More vivid manifestations of endemic thyropathy are observed in rural areas, due to the influence of anthropogenic xenobiotics (pesticides, fertilizers), peculiarities of food consumptions by local residents who use 85 % of food grown in the fields that, in terms of iodine deficiency, is low in microelements. The western region of Ukraine with typical endemic, environmental, industrial, social and economic peculiarities, which increase the severity of the thyroid pathology among pregnant women, is characterized by a high frequency of occurrence of complicated gestation, birth and the development of newborns in women with the evident goiter iodine deficiency pathology.

Research purpose - the study of the dynamics of growth and prevalence of thyroid diseases during pregnancy, childbirth and the postpartum period in women under the influence of endemic iodine deficiency and anthropogenic factors

Materials and methods. The analysis of morbidity among pregnant women, the complications that arise during childbirth in seven regions of Western Ukraine with typical iodine deficiency characteristic features of soil and water sources, technological, goitrogenic destructions and pollution with ionizing radiation has been carried out.

Results and its discussion. Considering the dynamics of growth and occurrence of thyroid pathology during gestation, birth and the postpartum period in women from Volyn, Rivne, Lviv, Ternopil, Transcarpathia, Ivano-Frankivsk, Chernivtsi regions during the period from 2012 to 2016, the thyropathy has increased in 1.5 times.



Fig. 1. The monitoring of thyropathy morbidity in pregnant women in Western Ukraine in 2016 (the rate is per 100 pregnancies).

Particularly high rates of thyroid diseases have been observed among pregnant women in areas affected by the Chernobyl nuclear power plant (Rivne, Volyn), mountain areas of Transcarpathia and industrial areas of technogenic deposits (petroleum, chemical, coal, sulphur companies) of Lviv region. While analyzing the thyroid pathology morbidity in pregnant women in the Carpathian region the highest rates have been observed in mountain areas of Storozhinets, Vizhnytsa districts of Chernivtsi region, Rozhnyativ, Kosiv, Dolyna districts of Ivano-Frankivsk region, Tyachiv, Mukachevo districts of Transcarpathia region and Sambir district of Lviv region. In the northern regions of Western Ukraine the highest rates of thyroid disease in pregnant women have been marked in the areas of Lokachi in Volyn and Volodymyrets in Rivne regions (Fig. 1).

While considering the dynamics of frequency of thyroid diseases that occur in pregnant women (the rate is per 100 pregnancies) for the period of 2012 - 2016 in seven regions of Western

Ukraine the significant growth of thyropathy is noticeable in Volyn region from 20.15 in 2012 to 37.77 in 2016 and in Rivne region: 21.4 – 22.12 during the mentioned period (Fig. 2). There is a tendency of high growth of obstetric complications (bleeding, weakness of labour and delivery, fetal distress during preeclampsia, cesarean sections) in Transcarpathia region which is 2.3 times higher, the high rates can be observed in Rivne as well as in Volyn regions (Fig. 3).

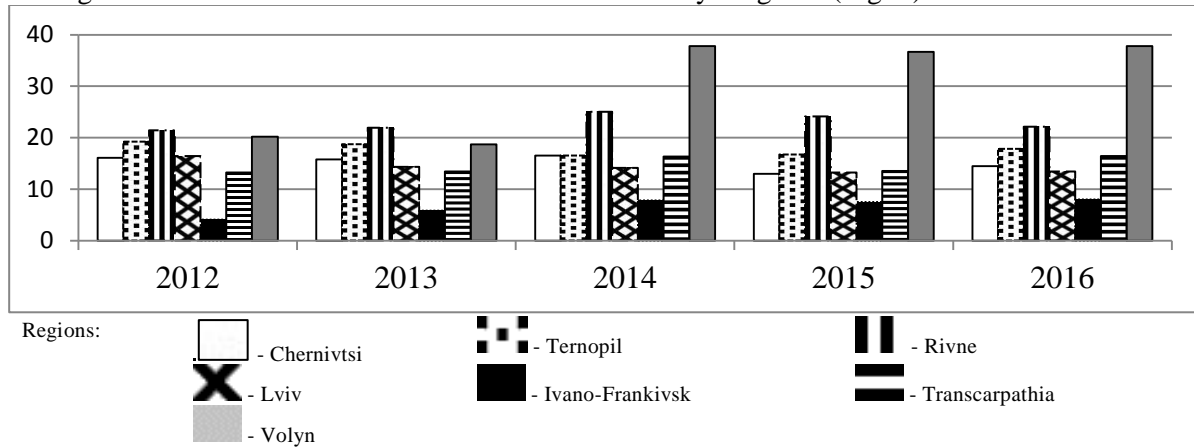


Fig. 2. The dynamics of frequency of thyroid diseases during pregnancy (the rate is per 100 pregnancies).

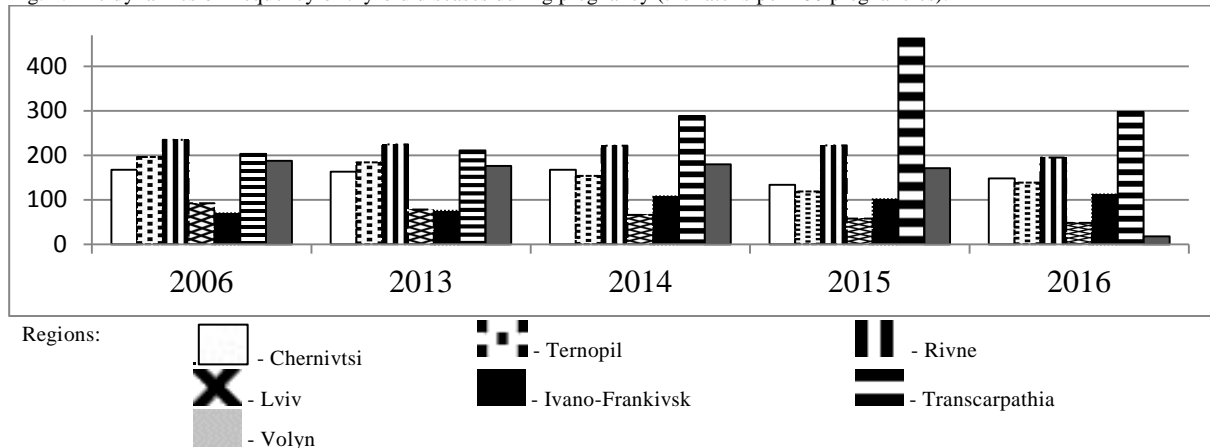


Fig. 3. The dynamics of changes of complications in childbirth in thyropathy per 1,000 births in 7 regions of Western Ukraine.

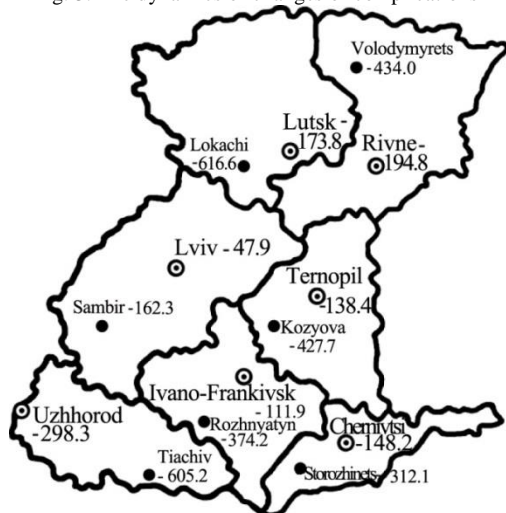


Fig. 4. The monitoring of complications in childbirth in 1000 women in labour in 7 regions of Western Ukraine in 2016.

Conclusions

Despite of the State program of prevention of iodine deficiency in the population during 2002 - 2005 in the period from 2012 to 2016 in seven regions of Western Ukraine which are referred to areas of endemic iodine deficiency, the increase in almost 1.5 times is marked, especially in the areas of industrial, technogenic, radioactive and mountain areas with a lack of iodine in soil and water. For the effective prevention of endemic goiter in pregnant women, the cause of the epidemiological situation should be taken into consideration which is based on the pathogenetic principle considering the

traditional as well as environmental and social spheres. The best option of iodine prevention is the use of iodized salt and iodine-containing food. The effectiveness of these measures depends on the regularity of use, the duration of prevention, the presence of accompanying goitrogenic substances. The compensation of iodine deficiency has an individual character and requires monitoring. The individual prevention should include seafood, iodine-containing multivitamins and food supplements into a diet.

The frequency of obstetric and perinatal complications in women with thyroid pathology was 2.3 times higher than in pregnant women without it. The nature of complications of gestation and childbirth depends on the severity of violations of thyroid homeostasis, its timely detection and correction. Pregnant women with thyropathy must be referred to a risk group of obstetric and perinatal pathology and they should be under constant supervision of an obstetrician-gynecologist, endocrinologist and psychologist. For a reasonable treatment of pregnant women in an endemic area, it is appropriate to determine the volume of the thyroid gland by means of ultrasound and its echo-structure at the beginning of pregnancy. If any noticeable changes are observed, it is advisable to determine the level of thyroid stimulating hormone (TSH) and free thyroxine (T4) to develop preventative measures including medicine containing iodine.

The monitoring of iodine balance, the state of the thyroid system in pregnant women and the screening for TSH in newborns in endemic zones should be mandatory, as it allows to identify pregnant women at risk of obstetric complications and a group of children with transient functional disorders of the thyroid gland, which will ensure their careful supervision during pregnancy, the postpartum and early neonatal periods. For the treatment of pregnant women with thyropathy except for the conventional methods of pathology (hormone replacement), the supervision service, psychotherapy, good food (seafood, fish), the correction of iodine deficiency states by means of potassium iodide to 200 mg per day during the period of pregnancy and breastfeeding is recommended.

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Реферати

ВПЛИВ ГІОТЕРОГЕНІВ ТА ЕКОЛОГІЧНИХ ФАКТОРІВ НА РЕПРОДУКТИВНУ СИСТЕМУ ЖІНОК З ЕНДЕМІЧНИМИ ЗАХВОРЮВАННЯМИ ЩИТОПОДІБНОЇ ЗАЛОЗИ

Пайенок О.С., Пайенок А.В., Задорожній А.М.

Вивчено динаміку зростання та розповсюдженості патології щитоподібної залози під час вагітності, пологів та післяпологового періоду в жінок під впливом ендемічного йододефіциту та техногенних чинників. Аналіз захворюваності серед вагітних, ускладнень в

ВЛИЯНИЕ ГОИТРОГЕНОВ И ЭКОЛОГИЧЕСКИХ ФАКТОРОВ НА РЕПРОДУКТИВНУЮ СИСТЕМУ ЖЕНЩИН С ЭНДЕМИЧНЫМИ ЗАБОЛЕВАНИЯМИ ЩИТОВИДНОЙ ЖЕЛЕЗЫ

Пайенок А.С., Пайенок А.В., Задорожний А.М.

Изучена динамика роста и распространенности патологии щитовидной железы во время беременности, родов и послеродового периода у женщин под влиянием эндемического йододефицита и техногенных факторов. Анализ заболеваемости среди беременных, осложненных

пологах у роділь Західної України. В роботі вказується, що розповсюдженість зобної ендемії в семи областях Західного регіону України під час гестації прямопропорційно залежить не лише від природного дефіциту йоду. Звертається увага на зобогенний вплив техногенного забруднення оточуючого середовища, додаткових струмогенних факторів, радіоактивних ізотопів йоду. Вказані особливості визначають необхідність комплексного підходу до проведення масових протизобних заходів і застосування системного моніторингу їх ефективності для покращення репродуктивного здоров'я та зниження перинатальних ускладнень.

Ключові слова: ендемічні, екологічні, радіаційні фактори, йодний дефіцит, тиреоїдний гомеостаз, зобогенез, вагітність, профілактика.

Стаття надійшла 10.10.2017 р.

в родах у рожениц Западной Украины. В работе указывается, что распространенность зобной эндемии в семи областях Западного региона Украины во время гестації прямопропорционально зависит не только от естественного дефицита йода. Обращается внимание на зобогенный влияние техногенного загрязнения окружающей среды, дополнительных струмогенных факторов, радиоактивных изотопов йода. Указанные особенности определяют необходимость комплексного подхода к проведению массовых протизобных мероприятий и применения системного мониторинга их эффективности для улучшения репродуктивного здоровья и снижения перинатальных осложнений.

Ключевые слова: эндемические, экологические, радиационные факторы, йодный дефицит, тиреоидный гомеостаз, зобогенез, беременность, профилактика.

Рецензент Ліхачов В.К.

DOI 10.26724 / 2079-8334-2017-4-62-71-76

УДК 616-037-084:616.152.21:616.61:616-053.32

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ДОСЛІДЖЕННЯ ГОСТРОГО УРАЖЕННЯ НИРОК У ПЕРЕДЧАСНО НАРОДЖЕНИХ НОВОНАРОДЖЕНИХ, ЯКІ ЗАЗНАЛИ ВПЛИВУ ПЕРИНАТАЛЬНОЇ ГІПОКСІЇ

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В статті наведено результати дослідження особливостей гострого ураження нирок у недоношених новонароджених, що зазнали впливу перинатальної гіпоксії, залежно від терміну гестації. Клінічні прояви гіпоксичного ураження нирок оцінювали за вираженістю набрякового синдрому, сечового синдрому та погодинним діурезом. При дослідженні маркерів пошкодження нирок отримано достовірно більші показники цистатину С у сироватці крові, ліпокаліну та інтерлейкіну-18 ($p < 0,01$) в сечі на 2-4 добу життя у недоношених дітей з гіпоксичним ураженням нирок проти передчасно народжених дітей без ознак перинатальної гіпоксії. Дослідження ниркового кровоплину показало достовірне зниження показників максимальної систолічної швидкості потоку в стовбурі ниркової артерії та пульсаційного індексу ($p < 0,05$). Встановлені відмінності маркерів ниркового ураження були більш виражені у недоношених новонароджених з терміном гестації < 32 тижні. Отримані результати свідчать, що сироватковий цистатин С, ліпокалін та інтерлейкін-18 в сечі у поєднанні з визначенням ниркового кровоплину є ефективними в ранній діагностиці гострого ураження нирок у дітей на тлі перенесеної перинатальної гіпоксії.

Ключові слова: недоношені новонароджені, гостре ураження нирок, цистатин С, інтерлейкін-18, ліпокалін, нирковий кровоплин.

Робота є фрагментом НДР «Оптимізація діагностики та лікування соматичної патології у дітей», № державної реєстрації: 0115U007075.

Гостре ураження нирок, раніше відоме як гостра ниркова недостатність, визначається гострим і зворотнім підвищенням рівня креатиніну в сироватці крові та/або супроводжується у новонароджених зменшенням кількості сечі [15, 21]. Пошкодження нирок у новонароджених характеризується клінічними проявами від помірних функціональних порушень до повної відмови функції нирок [1, 12]. Незважаючи на досягнення у розробці нових концепцій у питаннях дефініцій та діагностики гострого ураження нирок, специфічна ниркова патофізіологія критично хворих та недоношених новонароджених [7] ускладнює інтерпретацію показників діурезу і рівня креатиніну у цих пацієнтів [13]. Серед новонароджених, госпіталізованих у відділення інтенсивної терапії (ВІТН), підвищений ризик виникнення ГУН мають пацієнти, що перенесли тяжку перинатальну гіпоксію, яка призводить до розвитку поліорганної дисфункції, перерозподілу серцевого викиду та ниркової ішемії [20]. Частота ГПН у новонароджених, які перенесли тяжку перинатальну гіпоксію, за даними різних досліджень складає від 20% [13] до 56 % [7, 20].

Особливості нефрогенезу та функціонального стану нирки передчасно народжених немовлят робить їх надзвичайно вразливими до пошкоджуючого впливу гіпоксії. Нирки недоношених дітей мають більшу кількість гістологічно аномальних та збільшених в об'ємі клубочків у порівнянні з доношеними новонародженими [2, 22]. За даними Carmody J. та співав. [8] ГУН розвивається у 18% новонароджених з дуже малою масою тіла та у 40% пацієнтів ВІТН з екстремально малою масою тіла [5, 14]. В дослідженнях встановлено, що розвиток ураження нирок корелює з малою масою тіла,