GEORGIAN MEDICAL NEWS

ISSN 1512-0112

NO 1 (334) Январь 2023

ТБИЛИСИ - NEW YORK

ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

Monthly Georgia-US joint scientific journal published both in electronic and paper formats of the Agency of Medical Information of the Georgian Association of Business Press. Published since 1994. Distributed in NIS, EU and USA.

GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

GEORGIAN MEDICAL NEWS
No 1 (334) 2023

Содержание:

Erkin Pekmezci, Murat Türkoğlu.
URTICA DIOICA EXTRACT DOWNREGULATES THE GENE EXPRESSION OF 5A-RII IN HACAT CELLS: POSSIBLE IMPLICATIONS AGAINST ANDROGENIC SKIN DISEASES……..…….....……6-9

Anoop Karthika, Kowmudi Gullapalli, Krishnaveni Nagappan, Manohar Dronavajjula, Anilakumar Kandangath Raghavan, Ramalingam Peraman.
RESPONSE SURFACE METHODOLOGY ASSISTED ULTRAPERFORMANCE LIQUID CHROMATOGRAPHIC METHOD OPTIMIZATION FOR THE SIMULTANEOUS ESTIMATION OF SIX FAT-SOLUBLE VITAMINS IN TABLET DOSAGE FORM USING A DEVELOPED AND VALIDATED UPLC-Q-TOF/MS METHOD…….....10-22

M. Aghajanyan, M. Sargsyan.
COMPARATIVE ASSESSMENT OF ATHLETES' AUTONOMIC REACTIVITY BY HRV INDICATORS IN FUNCTIONAL TESTS OF VARIOUS DIRECTIONS…….....……23-28

Pilishvili O, Chkhaidze Z, Jinchveladze D, Dzamukashvili M, Khodeli N.
"EX VIVO" MACHINE PRESERVATION OF THE ABDOMINAL ORGANS OF A PIG…….....……..29-35

Olha Yakovleva, Oleh Hoina-Kardasevich, Nataliia Shcherbeniuk.
EFFICACY OF OSSEIN-HYDROXYAPATITE COMPLEX AS A PHARMACOLOGICAL CORRECTOR OF BONE LOSS (REVIEW)…….....……..36-40

Drobinska Nataliia, Abrahamovych Orest, Abrahamovych Maryana, Ivanochko Ruslana, Chemes Viktoriia.
CHARACTERISTICS OF CALCIUM-PHOSPHORUS METABOLISM AND BONE TURNOVER INDICATORS IN PATIENTS WITH LIVER CIRRHOSIS AND THEIR DIAGNOSTIC VALUE FOR ASSESSING BONE STRUCTURES DISORDER……....……..41-48

Reem H Mohammad, Muhammad A Al Kattan.
SMOKING JEOPARDIZED MITOCHONDRIAL FUNCTION VITIATING LIPID PROFILE…….....……..49-51

Margarita Vrej Sargsyan.
SPECIFICITIES OF THE COURSE OF SUBCLINICAL HEPATITIS AMONG YOUNG ADULTS WITH ACUIE GLOMERULONEPHRITIS…….....……..52-56

ChigogidzeM, PagavaZ, Taboridze I, Lomia N, Saatashvili G, Sharashidze N.
ASSESSMENT OF CORONARY COLLATERAL CIRCULATION PREDICTORS AMONG PATIENTS WITH ACUTE CORONARY SYNDROME IN POPULATION GEORGIA…….....……..57-64

Zahraa S. Thabit, Harith Kh. Al-Qazaz.
HEALTH-RELATED QUALITY OF LIFE AMONG PATIENTS WITH OSTEOARTHRITIS: A CROSS-SECTIONAL STUDY…….....65-70

Nurkina Dinara Almatovna, Baimuratova Mayrash Aushatovna, Zhussupbekova Lazzat Ibrashevna, Kodaspayev Almat Turysbekovitch, Alimbayeva Saira Hamidzhanovna.
ASSESSMENT OF RISK FACTORS OF MYOCARDIAL INFARCTION IN YOUNG PERSONS…….....……..71-77

Zoryana Bilous, Orest Abrahamovych, Maryana Abrahamovych, Oksana Fayura, Anhela Fedets.
CHARACTERISTICS OF THE AUTONOMIC NERVOUS SYSTEM STATE, ASSESSED BY THE HEART RATE VARIABILITY STUDY IN CIRRHOTIC PATIENTS WITH SYNTROPIC CARDIOMYOPATHY AND ITS EATURES DEPENDING ON THE QT INTERVAL DURATION…….....……78-82

Tchernev G, Lozev I, Pidakev I, Kordeva S.
KARAPANDZIC FLAP FOR SQUAMOUS CELL CARCINOMA OF THE LOWER LIPP: POTENTIAL ROLE OF NITROSAMINES IN EPROSARTAN AS CANCER TRIGGERING FACTORS…….....……83-85

Skobska O.Ye, Zemskova O.V, Lisianyi O.M, Andrieiev S.A, Levcheniuk S.V, Khinikadze Mirza.
CLINICAL-AND-FUNCTIONAL ASSESSMENT OF THE EARLY POSTOPERATIVE OUTCOME OF SURGICAL TREATMENT OF PATIENTS WITH VESTIBULAR SCHWANNOMA…….....……..86-93

Vladyslava Kachkovska, Anna Kovchun, Viktor Kovchun, Ivan Klisch, Olha Marchuk, Iryna Dudchenko, Lyudmyla Prystupa.
ER22/23EK AND TTH111I POLYMORPHISMS IN THE GLUCOCORTICOID RECEPTOR GENE IN PATIENTS WITH BRONCHIAL ASTHMA WITH REGARD TO THE AGE OF ONSET…….....……94-97

S.B.Imamverdiyev, E.C.Qasımov, R.N.Naghıyev.
COMPARATIVE RESULTS OF MODERN EXAMINATION METHODS IN EARLY DIAGNOSIS OF BLADDER CANCER, DETERMINATION OF THE DEGREE OF INVASION AND SELECTION OF RADICAL TREATMENT TACTICS……..……98-102

Baidurin S.A, Akhmetzhanova Sh.K, Ilmalieva A.Zh, Sagyndykova G.Zh, Orazbekova A.B.
MYELODYSPLASTIC SYNDROME: DIAGNOSIS, TREATMENT AND PROGNOSIS (LITERATURE REVIEW)…….....……103-107

Popovych T, Zaborovskyy V, Baryska Ya, Pohoryelova Z, Maslyuk O.
THE NATURE AND FEATURES OF SURROGACY AS AN ASSISTED REPRODUCTIVE TECHNOLOGY….....…108-112

Tagiyeva Fakhriya Alamdar.
PECULIARITIES OF LIPID EXCHANGE IN PREGNANT WOMEN WITH OBESITY…….....…113-115

ML Touré, G Carlos Othon, SM Diallo, TH Baldé, SD Barry, MM Konaté, F Sakadi, FD Kassa, A Kourouma, JM Kadji, M Diakité, A Sakho, MT Diallo, S Condé, V Millimono, D Camara, H Madandi, TM Diallo, E-Lamah, FA Cisse, A Cissé.
EPILEPTIC SEIZURES REVEALING STURGE WEBER'S DISEASE IN A TROPICAL ENVIRONMENT: STUDY OF EIGHT CASES…….....……..116-124

Makhlynets NP, Prots HB, Pantus AV, Ozhogan ZR, Plaviuk LYu.
THE EXISTENCE OF A FUNCTIONAL MATRIX IN THE DEVELOPMENT OF THE FACIAL SKELETON IN CHILDREN…….....……..125-132

Zaitsev A.V, Ilenko-Lobach N.V, Boychenko O.M, Ilenko N.M, Krutikova A.D, Ivanitskyi I.O, Bublii T.D, Kotelevska N.V.
INTEGRAL METHOD FOR ASSESSING THE EFFICIENCY OF DENTAL CARIES PREVENTION…….....…133-136

I. Ye. Herasymiuk, O.M. Herman, O.P. Ilkiv.
ULTRASTRUCTURAL FEATURES OF THE REARRANGEMENT OF THE CELLS OF THE HEMATOTESTICULAR BARRIER AND THE SPERMATOGENIC EPITHELIUM OF THE RATS TESTICLES DURING THE SUDDEN WITHDRAWAL OF PREDNISOLONE AFTER ITS LONG-TERM INTRODUCTION IN HIGH DOSES….....137-141

ML Touré, G Carlos Othon, A Touré, M Diakité, K Condé, DF Kassa, F Sakadi, D Camara, S Conde, V Millimono, MS Diallo, SM Diallo, JM Kadji, E-Lamah, FA Cisse, A Cissé.
GAYET WERNICKE'S ENCEPHALOPATHY AFTER COVID-19 IN ELDERLY SUBJECTS IN TROPICAL ENVIRONMENTS: STUDY OF SIX (6) OBSERVATIONS IN CONAKRY…….....……142-146

Uwe Wollina.
EROSIVE PUSTULAR DERMATOSIS OF THE SCALP (EPDS) – A CASE SERIES AND SHORT REVIEW….....147-152

GEORGIAN MEDICAL NEWS
No 1 (334) 2023

PECULIARITIES OF LIPID EXCHANGE IN PREGNANT WOMEN WITH OBESITY

Tagiyeva Fakhriya Alamdar.

Doctor of Philosophy in Medicine, Department of Obstetrics and Gynecology II, Azerbaijan Medical University, Baku, Azerbaijan.

Abstract.

Background/aim: The high frequency of obstetric pathology is explained by the violation of adaptive and compensatory-protective mechanisms, the breakdown of the activity of regulatory systems that occur during obesity. Determining the levels and dynamics of changes in lipid metabolism during the gestation period in pregnant women with obesity is of particular interest.

The purpose of this study was to evaluate the dynamics of lipid metabolism changes in pregnant women with obesity.

Materials and methods: The work is based on clinical-anthropometric and clinical-laboratory results of studies of 52 pregnant women with abdominal obesity (the main group). The term of pregnancy was determined by anamnestic data (date of last menstruation, first appearance in a women's consultation) and the results of ultrasound fetometry.

The criteria for inclusion of patients in the main group were a BMI value above 25 kg/m^2. Waist circumference (FROM) and hip circumference (ABOUT) were also measured. The ratio FROM/TO was calculated. Obesity was regarded as abdominal with a waist circumference of more than 80 cm and an OT/OB ratio of ≥ 0.85.The control group consisted of 80 healthy pregnant women with a BMI before pregnancy of 18.5 – 25 kg/m^2. The values of the studied indicators obtained in this group were used as a starting point of comparison as physiologically normal values. The state of fat metabolism was assessed according to lipidogram data. The study was conducted three times during pregnancy – at 8-12, 18-20 and 34-36 weeks of gestation. Blood samples were taken from the ulnar vein in the morning on an empty stomach 12-14 hours after eating. High- and low-density lipoproteins were determined by the homogeneous method, total cholesterol and triglycerides were determined by the enzymatic colorimetric method.

Results: It was found that the increasing imbalance of lipidogram parameters was accompanied by an increase in BMI: OH (r=0.251; p=0.001), TG (r=0.401; p=0.002), VLDL (r=0.365; p=0.033), HDL (r= - 0.318; p=0.002).

The development of pregnancy was accompanied by an increase in fat metabolism in the main group at 18-20 and 34-36 weeks of gestation, respectively: OH – by 16.5% and 22.1%, LDL – by 6.3% and 13.0%, TG – by 13.6% and 28.4%, VLDL – by 14.3% and 28.5%. We have revealed the inverse dependence of HDL levels on the duration of pregnancy. So, if the HDL level at the gestation periods of 8-12 and 18-20 weeks did not have a significant difference (p>0.05) with the level of the control group, then by the end of gestation its significant decrease was observed. A decrease in HDL values – by 3.3% and 17.6% during gestation led to a pronounced increase in the atherogenicity coefficient by 32.1% and 76.4% during pregnancy at 18-20 weeks and 34-36 weeks, respectively. This coefficient indicates the distribution of OH between HDL and atherogenic lipoprotein fractions. Anti-atherogenic ratio of HDL/LDL decreased slightly in the dynamics of pregnancy in obese women – by 7.5% and 27.2%, respectively.

Thus, the results of the study indicate a significant increase in the group of obese pregnant women in the content of total cholesterol, triglycerides, VLDL with their maximum level by the end of gestation in comparison with patients with normal body weight.

Conclusions: Despite the fact that the metabolic changes occurring in the body of a pregnant woman are adaptive, they can play a role in the pathophysiological process of the development of pregnancy complications and labor disorders. With the progression of pregnancy, abdominal obesity in women is a risk factor for the development of pathological dyslipidemia.

Key words. Pregnancy, obesity, lipids, fat metabolism.

Introduction.

Physiological pregnancy is accompanied by significant changes in the metabolism in the woman's body, which is associated with the characteristics of the hormonal background and is aimed at maintaining the normal growth and development of the fetus [1,2]. At the same time, lipid metabolism undergoes the main changes [3]. During this period, there is a slight increase in the concentration of neutral fat, cholesterol, and lipids in the blood of the woman, which reflects the adaptation processes taking place during pregnancy and is aimed at creating optimal conditions for the development of the fetus [4-6].

Currently, the important role of lipids in maintaining homeostasis during pregnancy is known. Violations of their exchange determine the changes that occur in the "mother – placenta – fetus" system. The content of lipids in the blood increases in a wavy manner as pregnancy progresses due to the inhibition of lipase activity under the influence of estrogens and hyperinsulinemia. By the end of pregnancy, there is an increase in total cholesterol, high- and low-density lipoproteins and triglycerides compared with pre-pregnancy levels [7,8].

Obesity, as extragenital pathology, often causes aggravated pregnancy, childbirth, and the postpartum period [9].

The high frequency of obstetric pathology is explained by the violation of adaptive and compensatory-protective mechanisms, the breakdown of the activity of regulatory systems that occur during obesity. Determining the levels and dynamics of changes in lipid metabolism during the gestation period in pregnant women with obesity is of particular interest.

The purpose of this study was to evaluate the dynamics of lipid metabolism changes in pregnant women with obesity.

© GMN

Table 1. *Blood lipid parameters in pregnant women at different periods (M±m, min-max).*

Lipid spectrum	Observation groups					
	The main group (n=52)	**The control group (n=80)**	**The main group (n=52)**	**The control group (n=80)**	**The main group (n=52)**	**The control group (n=80)**
	8-12 weeks		**18-20 weeks**		34-36 weeks	
TC mmol/l	4,96±0,071* (4,51-5,58)	4,65±0,039 (4,11-5,26)	5,78±0,076* (5,11-6,43)	5,31±0,055 (4,51-6,13)	6,06±0,11** (5,28-6,97)	5,20±0,052 (4,41 - 5,94)
LDL mmol/l	2,71±0,027* (2,47-2,93)	2,56±0,020 (2,26-2,84)	2,88±0,034* (2,65-3,41)	2,79±0,022 (2,48-3,15)	3,06±0,034 (2,81-3,34)	3,07±0,033 (2,57-3,48)
HDL mmol/l	1,81±0,028 (1,63-2,07)	1,76±0,022 (1,47-2,12)	1,75±0,017 (1,60-1,90)	1,72±0,012 (1,56-1,94)	1,49±0,02 (1,32-1,63)**	1,66±0,012 (1,52-1,86)
TG mmol/l	1,69±0,036** (1,41-1,95)	1,00±0,013 (0,82-1,22)	1,92±0,027** (1,71-2,13)	1,33±0,013 (1,17-1,55)	2,17±0,026** (1,97 - 2,39)	1,42±0,013 (1,24-1,64)
VLDL mmol/l	0,77±0,04** (0,21-1,24)	0,46±0,07 (0,35-1,21)	0,88±0,09** (0,34-1,45)	0,61±0,05 (0,42-1,33)	0,99±0,08** (0,51-1,45)	0,65±0,04 (0,49-1,37)
AI standard unit	1,74±0,025 (0,27-2,69)	1,64±0,077 (0,39-2,23)	2,30±0,023** (1,76-2,65)	2,09±0,045 (1,04-2,58)	3,07±0,061** (1,12-3,38)	2,13±0,038 (1,09-2,61)
HDL/ LDL unit	0,66±0,01 (0,37-0,89)	0,68±0,05 (0,33-0,75)	0,61±0,03 (0,35-0,77)	0,62±0,05 (0,37-0,80)	0,48±0,07 (0,31-0,62)	0,54±0,06 (0,39-0,83)

*Note: The differences are significant in relation to the control group: * – p < 0,05, ** – p < 0,001*

Materials and methods.

The work is based on clinical-anthropometric and clinical-laboratory results of studies of 52 pregnant women with abdominal obesity (the main group). The gestational age was determined by anamnestic data (the date of the last menstruation, the first appearance at the antenatal clinic) and the results of ultrasound fetometry. When registered for dispensary registration of pregnancy, all women were subjected to traditional anthropometric research with height (cm) and weight (kg) measurements, followed by calculation of body mass index (BMI). Obesity was diagnosed based on the calculation of the BMI index using the formula:

BMI=body weight (kg)/height (m^2)

The criteria for inclusion of patients in the main group were BMI values above 25 kg/m^2. We also measured waist circumference (WC) and hips circumference (HC) and then calculated the ratio WC/HC. Obesity was regarded as abdominal with a waist circumference of more than 80 cm and WC/HC ratio ≥ 0,85. The control group consisted of 80 healthy pregnant women with a BMI before pregnancy of 18,5 –25 kg/m^2. The values of the studied parameters obtained in this group were used as a starting point of comparison as physiologically normal values.

The state of fat metabolism was assessed according to lipidogram data.

In accordance with the goal, 52 pregnant women carried out the determination of the concentration of total cholesterol (TC), triglycerides (TG), low density lipoproteins (LDL) and high-density lipoproteins (HDL). The study was performed three times during pregnancy – at 8-12, 18-20 and 34-36 weeks of gestation. Blood samples were taken from the ulnar vein in the morning on an empty stomach 12-14 hours after a meal. High- and low-density lipoproteins were determined by a homogeneous method, total cholesterol, and triglycerides – by an enzymatic colorimetric method. The atherogenic index was calculated using the formula:

AI=(TC-HDL)/HDL

The ratio of HDL/LDL was also determined, and the concentration of very low-density lipoproteins (VLDL) was calculated by the formula:

VLDL=TG/2,18

Statistical analysis.

Statistical data analysis was performed using the MedCalc statistical software package for biomedical research. The evaluation of the obtained results was carried out by methods of statistical description and testing of statistical hypotheses. For comparison of normally distributed values, the Student's t-test was used; if the distribution differs from the normal, the non-parametric Mann-Whitney test (U-test) was used. The data for the parametric distribution are presented as mean values of the measured value and standard error (M ± m). Evaluation of the strength and relationship between phenomena or signs was carried out using the Pearson pair-correlation coefficient (r). The critical value of the level of statistical significance (p) in testing null hypotheses was taken to be 0,05.

Results.

A normal pregnancy is accompanied by profound metabolic changes in the body of a woman, which for a number of reasons turn into pathological conditions. However, serious changes are often observed in lipid metabolism.

In pregnant women with obesity, significantly higher levels of TC, TG and VLDL in serum were detected at all periods of gestation, which is a result of their increased production. During the analysis of the dynamics of lipid profile indicators of the examined women, it was found that the average lipid levels increase in all pregnant women with an increase in the gestation period, while the concentration of atherogenic lipids represented by TC, TG, VLDL was significantly higher in women with obesity (p < 0,05).

The results of the analysis of the dynamics of lipid profile in terms of pregnancy in patients of the main and control groups are presented in table 1.

With the progression of pregnancy, dyslipidemic changes intensified, including in the control group of women. Such an increase in lipid concentration in healthy women can be considered as a physiological phenomenon that promotes the growth and development of the fetus, enhanced steroidogenesis, as well as providing high energy demands of the pregnant woman.

When comparing lipid metabolism in women of the main and control groups at gestational age 34-36 weeks, statistically significant differences were found. The values of TC, TG, VLDL and atherogenicindex increase with obesity compared with the control group. In order to assess the association of the studied clinical and metabolic parameters in pregnant women, a correlation analysis was conducted, during which there was a close relationship between the lipid profile and BMI. It was established that the growing imbalance of lipidogram indices was accompanied by an increase in BMI: TC ($r = 0,251$; $p = 0,001$), TG ($r = 0,401$; $p = 0,002$), VLDL ($r = 0,365$; $p = 0,033$), HDL ($r = - 0,318$; $p = 0,002$).

Analysis of the obtained results showed that lipid metabolism disorders have a close direct and inverse relationship with BMI and an increase in the duration of pregnancy. The development of pregnancy was accompanied by an increase in fat metabolism in the main group at 18-20 and 34-36 weeks of gestation, respectively: TC – by 16,5% and 22,1%, LDL – by 6,3% and 13,0%, TG – by 13,6% and 28,4%, VLDL – by 14,3% and 28,5%. We have revealed an inverse relationship between HDL levels and gestational age. So, if the level of HDL at the gestational age of 8-12 and 18-20 weeks did not have a significant difference ($p> 0,05$) with the level of the control group, then by the end of the gestation a significant decrease was observed. The decrease in HDL values – by 3,3% and 17,6% during gestation led to a strongly marked increase in the atherogenic index by 32,1% and 76,4% in gestational age 18-20 weeks and 34-36 weeks, respectively. This index indicates the distribution of TC between HDL and atherogenic lipoprotein fractions. The antiatherogenic HDL/LDL ratio slightly decreased in the dynamics of pregnancy in obese women – by 7,5% and 27,2%, respectively.

Discussion.

The results of the study indicate a significant increase in the group of obese pregnant women in the content of total cholesterol, triglycerides, VLDL with their maximum level by the end of gestation in comparison with patients with normal body weight. Along with this, there is a decrease in HDL levels, which is accompanied by an increase in the atherogenic potential of the blood serum. In general, the analysis of the obtained results of changes in the blood lipid spectrum in obese pregnant women shows their more pronounced hyperlipidemic orientation compared with physiologically occurring pregnancy. Taking into account the above, it becomes obvious that excessive accumulation of adipose tissue poses a significant risk to the physiological course of metabolic processes in the pregnant woman's body, thereby increasing the risk of complicated pregnancy. Further studies aimed at studying the metabolic profile in physiological and complicated pregnancy should contribute to expanding the understanding of the mechanisms of fetal metabolic programming.

Conclusion.

Despite the fact that the metabolic changes occurring in the body of a pregnant woman are adaptive, they can play a role in the pathophysiological process of the development of pregnancy complications and labor disorders. With the progression of pregnancy, abdominal obesity in women is a risk factor for the development of pathological dyslipidemia.

Conflict of interests.

The authors declare that they have no conflicts of interest.

Authors' contributions.

Tagiyeva Fakhriya Alamdar participated in the study design, collected data, analyzed data, interpreted results, and edited the manuscript. TÇ participated in the study design and interpreted results; and collected data and edited the manuscript; read and approved the final manuscript.

ORCID: 0000-0003-4447-1624
SCIENCE INDEX: (SPIN-код): 9864-7889.

REFERENCES

1. Protopopova NV, Samchuk PM, Sukhovskaya VV. Physiological changes in a woman's body during pregnancy. Irkutsk. 2005:119.
2. Grigorieva NA, Glukhova TN, Ponukalina EV. Dynamic lipid spectrum shifts during uncomplicated pregnancy in patients of active reproductive age. International Journal of Experimental Education. 2015;9:137-138.
3. Ivanova OO, Starodubtseva NL, Shmakov RG. The role of lipids in the development of pregnancy complications. Obstetrics and gynecology. 2018;4:5-9.
4. Ushakova OV, Rzayeva SM, Golubenko DS. Metabolic disorders during pregnancy Healthcare of the Far East. 2017;1:52-54.
5. Aliyeva FKh. Violation of carbohydrate and lipid metabolism during pregnancy (literature review) Perinatology. 2018;13:68-73.
6. Devlieger R, Benhalima K, Damme P, et al. Maternal obesity in Europe: where do we stand and how to move forward: A scientific paper commissioned by the European Board and College of Obstetrics and Gynaecology (EBCOG) Eur J Obstet Gynecol Reprod Biol. 2016;201:203-208.
7. Lindsay KL, Hellmuth C, Uhl O, et al. Longitudinal Metabolomic Profiling of Amino Acids and Lipids across Healthy Pregnancy PLoS One. 2015;10:e0145794.
8. Tkacheva ON, Galyautdinova AYu, Prokhorovich EA. Disorders of lipid metabolism during pregnancy. Pharmateka. 2009;8:39-43.
9. Brite J, Laughon SK, Troendle J, et al. Maternal overweight and obesity and risk of congenital heart defects in offspring. Int J Obes (Lond). 2014;38:878-882.