GEORGIAN MEDICAL NEWS

ISSN 1512-0112

NO 9 (378) Сентябрь 2026

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 9 (378) 2026

Содержание:

Vadatchkoria R, Dondoladze K, Tsintsadze N, Kaushik A, Singh H.
HEALTH-RELATED CHALLENGES, PSYCHO-EMOTIONAL WELLBEING, AND ADAPTATION EXPERIENCES OF INTERNATIONAL STUDENTS IN A FOREIGN ACADEMIC ENVIRONMENT……6-13

Tan Kaiyou, Zhang Zhaoying.
EPIDEMIOLOGY AND POST-EXPOSURE MANAGEMENT OF RABIES EXPOSURES AT A COMMUNITY HEALTH CENTER: A 2024–2025 RETROSPECTIVE ANALYSIS……14-19

Josue Andres Orozco Pilco, Ximena del Rocío Robalino Flores, Silvia Paola Monar Basantes, Luisa Carolina González Ramírez.
RETICULOCYTE COUNT AND HEMATOLOGICAL INDICES IN MICROCYTIC HYPOCHROMIC ANEMIA: PREVALENCE AND PATTERNS AMONG INFANTS UNDER 24 MONTHS IN ANDEAN ECUADOR……20-25

Mirgul Kapakova, Jamilya Mansurova, Anar Kozhabayeva, Beshimbayeva Zhuldyz, Zhanar Toktarova, Meiramgul Tokbulatova, Galiya Assanova, Bolat Ashirov, Dariga Nurgalieva.
INDEPENDENT PREDICTORS OF SHORT-TERM MORTALITY IN PATIENTS WITH CHRONIC HEART FAILURE AND ANEMIA……26-32

Aynur Isayeva, Yusif Aliyev, Nergiz İmanova.
BASIC PRINCIPLES OF THE CONCEPT OF ACCELERATED POSTOPERATIVE RECOVERY AFTER SUBTOTAL COLECTOMY……33-36

David Gogoberidze, Irine Bakhutashvili.
MAJOR ADVERSE CARDIOVASCULAR EVENTS AFTER ACUTE CORONARY SYNDROME: DEFINITION, TIMING, RATES, MAIN RISK FACTORS, AND WAYS TO IMPROVE……37-43

Nataliya Byelyayeva, Pavlo Velychko, Olha Savitska, Zhanna Bogdan, Nataliia Ivantsev.
THE EFFECTIVENESS OF PSYCHOLOGICAL INTERVENTIONS IN MANAGING ANXIETY AND STRESS FOLLOWING TRAUMATICEVENTS……44-53

Hayfa A. Al-Olayan.
THIRTY-DAY INCIDENCE OF SURGICAL SITE INFECTION AND PERIOPERATIVE PROCESS COMPLIANCE IN A UNIVERSITY HOSPITAL DAY-SURGERY UNIT: A RETROSPECTIVE COHORT STUDY OF 200 PATIENTS……54-66

Grigoryan A.A, Makinyan L.G, Podlesnaya A.A, Imankulov M.A, Abu Zaalan V.M.
FACTORS ASSOCIATED WITH FUNCTIONAL OUTCOME AND SELECTION OF SURGICAL STRATEGY IN FOOT DROP SYNDROME ASSOCIATED WITH COMMON PERONEAL NEUROPATHY……67-72

Norah Hadi Mohammed, Tala Mustafa Ezzat, Fatima Alzahra Mukhtar, Ahmed. L. Osman, Marwan Ismail, Areeg Khalfallah, Ghina Yazbek, Sara Mohammed Ali, Abdelgadir Elamin Eltom.
CORRELATION OF HBA1C WITH INFLAMMATORY MARKERS AND NEUTROPHIL-TO-HIGH-DENSITY LIPOPROTEIN RATIO IN PATIENTS WITH TYPE 2 DIABETES MELLITUS: A RETROSPECTIVE CROSS-SECTIONAL STUDY……73-75

Zainab Haitham Fathi, Ammar A.Y. Almulathanon.
ASSOCIATION BETWEEN INFERTILITY AND SERUM LEVELS OF ANTI-MÜLLERIAN HORMONE, FOLLICLE-STIMULATING HORMONE, LUTEINIZING HORMONE, AND PROLACTIN ACCORDING TO VITAMIN D SUPPLEMENTATION STATUS……76-82

Zhadra Kalbagayeva, Zaituna Khismetova, Nazym Iskakova, Aliya Atabayeva, Bakytkul Toktabayeva, Aigul Tugelbayeva, Sultan Seidumanov, Kamila Akhmetova, Bibinur Sydykova.
HEALTH-RELATED QUALITY OF LIFE AND ASSOCIATED FACTORS AMONG PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A CROSS-SECTIONAL STUDY……83-89

Tamta Chikobava, Ann Margvelashvili, Manana Kalandadze, Nino Tebidze, Vladimer Margvelashvili.
ASSESSMENT AND NONPHARMACOLOGICAL GUIDANCE OF CHILDREN'S BEHAVIOR AND DENTAL ANXIETY IN PEDIATRIC DENTISTRY: A STRUCTURED NARRATIVE REVIEW……90-97

Eglantina Bulica, Admir Sinamati, Alketa Tandili, Gentian Vyshka.
ETHICAL AND DEONTOLOGICAL DIMENSIONS OF RETINOPATHY OF PREMATURITY CARE: TOWARD A EUROPEAN PERSPECTIVE……98-103

Tingliang Tao, Yun Huang, Mengdan Xu, Shaoguo Wang, Lihong Bao.
MACHINE LEARNING-BASED IDENTIFICATION OF KEY GENES AND DEVELOPMENT OF A PREDICTIVE NOMOGRAM FOR PERIODONTITISDIAGNOSIS……104-111

Ahmed Abdelhadi Ahmed Nasr, Selma E. Hago Dawd, Ammar Abdelmola, Husham O. Elzein, Menna Ibrahim ALbader, Ezeldine K Abdalhabib, Elryah I Ali, Alneil Hamza, Mohammed Ibrahim Saeed, Salah Eldin Omar Hussein, Sara Mohammed Ali, Ayman H. Alfeel, Amar Mohamed Ismail, Omer Fadul Idris.
ASSOCIATION OF SER447TER, HINDIII AND PVUII LIPOPROTEIN LIPASE GENE POLYMORPHISMS WITH LIPID PROFILE IN CORONARY HEART DISEASE……112-120

Indira Adilbekova, Nishangul Bozhbanbayeva, Saule Issenova, Gulmira Altynbayeva, Dilfuza Sultanmuratova.
MATERNAL AND CORD-BLOOD HOMOCYSTEINE AND NEONATAL S100B IN PRETERM BIRTH: ASSOCIATIONS WITH IN-HOSPITAL NEONATAL OUTCOMES IN A PROSPECTIVE COHORT……121-130

Hayder G Oufi, Rana Hussein Kutaif, Ruaa E. Alabd, Hawraa Hussein Abd, Ranya Riyadh Hameed, Esraa Adnan Al-Muhanna, Dina Amer Abd, Riham Taha Yousif.
CLINICAL AND CULTURAL PERSPECTIVES ON POLYCYSTIC OVARY SYNDROME (PCOS) IN WOMEN BASED ON SYMPTOM CLUSTERING AND DIAGNOSTIC TRENDS…….131-141

Ferat Sallahu, Anamarija Jankulovska, Altin Sallahu.
LYMPHOVASCULAR AND PERINEURAL INVASION IN RELATION TO THE PRESENCE AND BURDEN OF NODAL METASTASIS IN RESECTED GASTRIC CANCER…….142-146

Toapanta Yugcha Iván, Toapanta Paredes Ximena, León Corrales Luis Sebastián, Maisincho Proaño Erika Fernanda, Alvarado Buenaño Marlon Andrés, Reinoso Molina Marcos Rubiño.
SOCIODEMOGRAPHIC FACTORS ASSOCIATED WITH SUICIDE RISK AMONG URBAN AND RURAL ADOLESCENTS IN AMBATO, ECUADOR…….147-151

Elmira Amanova, Gaukhar Abassova, Gulnaz Kaishibayeva, Vitaliy Kovalchuk, Yessengeldi Ismailov, Marzhan Abdrazakova, Sandugash Alipbekova, Saule Tuktibayeva, Kanatzhan Kemelbekov, Adlet Yernazarov.
FREQUENCY OF NEUROPATHIC PAIN FEATURES AMONG NEUROLOGICAL OUTPATIENTS AND THEIR IMPACT ON QUALITY OF LIFE: A CROSS-SECTIONAL SCREENING STUDY OF 1,705 PATIENTS…….152-162

Shaikha Fatmah Al Sharqia, Magdy Ali Abdou Gouda, Praveen Kumar, Shima Ibrahim Ali.
PERCEIVED CAUSES AND CONSEQUENCES OF DIAGNOSTIC ERRORS IN THE SECOND-TRIMESTER FETAL ANOMALY SCAN…….163-171

Moldir Tleubayeva, Meyirbek Aimagambetov, Kirill Krylov, Yernar Mamyrov, Marat Syzdykbayev, Samatbek Abdrakhmanov, Gulshat Alimkhanova, Assel Tulebayeva, Roman Khripunov.
NUTRITIONAL SUPPORT IN SURGICAL PATIENTS. PROTEIN-ENERGY METABOLISM DISORDERS…….172-180

Eranov Sh. N, Urinbaev Payzilla, Khodjanov Iskandar Yunusovich, Eranov Nurali Fayziyevich, Khalimova Fariza Tursunbaevna.
COMPREHENSIVE INSTRUMENTAL AND FUNCTIONAL ASSESSMENT OF POST-TRAUMATIC ELBOW CONTRACTURE IN CHILDREN AT THE INITIAL STAGE OF REHABILITATION…….181-187

Diana Dzidziguri, Irakli Chkhikvishvili, Maka Mantskava, Eka Shekiladze, Ekaterine Bakuradze, Tornike Liverashvili, Nina Kipiani, Sophio Turabelidze-Robaqidze, Tamar Sanikidze.
PHYTOCHEMICAL CHARACTERISATION, RADICAL-SCAVENGING ACTIVITY AND EXPERIMENTAL MICROCIRCULATORY RESPONSES TO GEORGIAN CUCURBITA MOSCHATA FLESH-WITH-PEEL EXTRACT…….188-195

Tchernev G, Tchernev KG Jr, Kordeva S.
DERMATOLOGIC SURGERY PEARLS: KERATINOCYTE CANCER AFFECTING HIGH RISK FACIAL REGIONS - LOGARITHMIC SPIRAL FLAP FOR NASAL ALAR RECONSTRUCTION AND V-TO-T FLAP FOR LOWER LIP RECONSTRUCTION…….196-203

Yerzhan Khochshanov, Dulat Baltabayev, Svetlana Khan, Yelena Aisenova, Zhibek Dautbayeva, Zhanar Akhmetova, Viktoriya Nazarova, Assel Meiramova.
OCULAR SURFACE AND TEAR FILM CHANGES IN GRAVES' DISEASE ACCORDING TO THYROID EYE DISEASE STATUS…….204-209

Laktionova M, Barmanasheva Z, Onglas A, Kulzhanov M, Baimuratova M, Sarsenbaeva M.
PREVALENCE AND RISK FACTORS OF PELVIC ORGAN PROLAPSE AMONG WOMEN IN ALMATY: A HOSPITAL-BASED STU DY…….210-217

Ahmed Abdelhadi Ahmed Nasr, Tagwa Yousif Elsayed Yousif, Ravshanova Maftuna Zoxidjonovna, Husham O. Elzein, HabibAllaa Eldaw Mohamed, Ezeldine K Abdalhabib, Elryah I Ali, Alneil Hamza, Mohammed Ibrahim Saeed, Salah Eldin Omar Hussein, Ayman H. Alfeel, Amar Mohamed Ismail, Omer Fadul Idris.
LIPOPROTEIN LIPASE GENE POLYMORPHISMS AND THEIR ASSOCIATION WITH APOLIPOPROTEIN A-I AND B-100 CONCENTRATIONS IN PATIENTS WITH CORONARY HEART DISEASE: A CROSS-SECTIONAL GENETIC ASSOCIATION STUDY …….218-225

Khamdamova Muhayyoxon Tukhtasinovna, Khalilova Mekhriniso Tuymurodovna, Askarova Zebo Zafarjonovna, Yusupova Mekhribon, Kambarova Dildora Noxidovna, Khalimova Fariza Tursunbaevna.
MORPHOLOGICAL FEATURES OF THE CERVICAL EPITHELIUM AND STROMA IN CHRONIC RECURRENT CERVICITIS WITH AND WITHOUT SQUAMOUS INTRAEPITHELIAL LESIONS: A COMPARATIVE CROSS-SECTIONAL STUDY…….226-233

GEORGIAN MEDICAL NEWS
No 9 (378) 2026

CORRELATION OF HBA1C WITH INFLAMMATORY MARKERS AND NEUTROPHIL-TO-HIGH-DENSITY LIPOPROTEIN RATIO IN PATIENTS WITH TYPE 2 DIABETES MELLITUS: A RETROSPECTIVE CROSS-SECTIONAL STUDY

Norah Hadi Mohammed[1], Tala Mustafa Ezzat[1], Fatima Alzahra Mukhtar[1], Ahmed. L. Osman[2], Marwan Ismail[2], Areeg Khalfallah[3], Ghina Yazbek[3], Sara Mohammed Ali[2], Abdelgadir Elamin Eltom[2].

[1]Bachelor of Medical Laboratory Sciences Program, College of Health Sciences, Gulf Medical University, Ajman, UAE.
[2]Department of Medical Laboratory Sciences, College of Health Sciences, Gulf Medical University, Ajman, UAE.
[3]Thumbay labs, Ajman, UAE

Abstract.

Background: Type 2 diabetes mellitus (T2DM) is increasingly recognized as a chronic inflammatory disorder characterized by persistent low-grade inflammation and immune dysregulation. Inflammatory biomarkers derived from routine laboratory investigations may provide valuable information regarding metabolic and inflammatory disturbances.

Objective: To investigate the relationship between glycated hemoglobin (HbA1c) and inflammatory markers, including neutrophil-to-lymphocyte ratio (NLR), monocyte-to-lymphocyte ratio (MLR), platelet-to-lymphocyte ratio (PLR), and neutrophil-to-high-density lipoprotein ratio (NHR) in patients with T2DM.

Methods: A retrospective cross-sectional study was conducted using laboratory records from Thumbay Laboratories, Ajman, United Arab Emirates. The study included 100 patients with T2DM and 100 non-diabetic controls. Hematological and biochemical parameters were collected, and inflammatory ratios were calculated. Statistical analyses included independent t-tests and Pearson correlation analysis.

Results: The mean HbA1c level was significantly higher among diabetic patients than controls (8.53 ± 1.25% vs. 5.41 ± 0.27%, $p < 0.001$). NHR was significantly elevated in diabetic patients (0.10 ± 0.04 vs. 0.07 ± 0.03, $p < 0.001$). NLR was higher in diabetic patients but did not reach statistical significance ($p = 0.076$). PLR demonstrated a weak negative correlation with HbA1c ($r = -0.20$, $p = 0.046$).

Conclusion: NHR was significantly elevated in patients with T2DM ($p < 0.001$) and, although it did not show a statistically significant linear correlation with HbA1c itself ($r = -0.133$, $p = 0.191$), it may still provide independent, non-redundant information about the inflammatory-lipid status of these patients that is not captured by HbA1c alone.

Key words. Type 2 diabetes mellitus, HbA1c, inflammation, NLR, MLR, PLR, NHR.

Introduction.

Type 2 diabetes mellitus (T2DM) is one of the most important public health challenges worldwide. According to the International Diabetes Federation, more than 500 million adults are currently living with diabetes globally, with the Middle East showing one of the fastest growth rates [1]. Traditionally, T2DM has been considered a metabolic disorder characterized by hyperglycemia resulting from insulin resistance and β-cell dysfunction. However, increasing evidence indicates that chronic low-grade inflammation plays an essential role in the pathogenesis and progression of T2DM [2-3]. Persistent hyperglycemia contributes to oxidative stress, endothelial dysfunction, and activation of inflammatory pathways, resulting in increased production of cytokines and immune cell activation [2-4]. Hemoglobin A1c (HbA1c) remains the standard marker for long-term glycemic control [5,6]. However, HbA1c alone does not provide information regarding inflammatory status. Several hematological indices, including neutrophil-to-lymphocyte ratio (NLR), monocyte-to-lymphocyte ratio (MLR), and platelet-to-lymphocyte ratio (PLR), have been proposed as inexpensive inflammatory markers derived from routine blood counts [7,8]. More recently, the neutrophil-to-high-density lipoprotein ratio (NHR) has emerged as a novel marker integrating inflammation and lipid metabolism [9,10]. Therefore, this study aimed to investigate the relationship between HbA1c and inflammatory markers among patients with T2DM in the United Arab Emirates.

Materials and Methods.

This retrospective cross-sectional study was conducted using laboratory records obtained from Thumbay Laboratories, Ajman, United Arab Emirates. A total of 200 participants were included, comprising 100 patients diagnosed with type 2 diabetes mellitus (T2DM) and 100 non-diabetic controls. Participants aged between 40 and 80 years with complete laboratory records were eligible for inclusion. Individuals with acute infections, chronic inflammatory diseases, malignancies, liver disease, renal disease, pregnancy, hematological disorders, or those receiving immunosuppressive therapy were excluded. Complete blood count parameters were obtained using an automated hematology analyzer, while high-density lipoprotein (HDL) cholesterol levels were measured using the Beckman Coulter DxC 700 AU chemistry analyzer. The inflammatory indices, including neutrophil-to-lymphocyte ratio (NLR), monocyte-to-lymphocyte ratio (MLR), platelet-to-lymphocyte ratio (PLR), and neutrophil-to-HDL ratio (NHR), were calculated from routine laboratory parameters. Continuous variables were expressed as mean ± standard deviation, and independent t-tests were used to compare groups. Pearson correlation analysis was performed to assess the relationships between HbA1c and inflammatory markers, with a p-value of less than 0.05 considered statistically significant. The study protocol was approved by the Gulf Medical University Institutional Review Board. Data on medication use (including antidiabetic agents, lipid-lowering therapy such as statins or fibrates, and anti-inflammatory drugs) and body mass index were not available in the laboratory database and could therefore not be recorded or included in the statistical analysis.

Results.

Demographic Characteristics:

A total of 200 participants were enrolled. The diabetic group consisted of 60 males and 40 females, whereas the control group included 56 males and 44 females.

NHR demonstrated a statistically significant increase among diabetic patients.

Discussion.

The present study demonstrated that patients with T2DM exhibit evidence of altered inflammatory status. The significantly elevated HbA1c values observed among diabetic patients confirm poor glycemic control and agree with previous reports demonstrating the role of chronic hyperglycemia in inflammatory activation [5,6,15]. Type 2 diabetes mellitus is increasingly recognized as a chronic inflammatory disease characterized by activation of innate immunity and release of inflammatory mediators [2-4]. Persistent inflammation contributes to insulin resistance, endothelial dysfunction, and diabetic complications.

The present study showed higher NLR values among diabetic patients, although the difference was not statistically significant. Similar findings have been reported by Turan et al. and Zhao et al., who demonstrated that elevated NLR was associated with poor glycemic control and diabetic complications [8,11].

Li et al. further reported that elevated NLR predicts cardiovascular outcomes in diabetic patients [14]. The absence of statistical significance in the current study may reflect the relatively stable clinical status of the study population.

MLR did not differ significantly between groups. Previous studies have shown that MLR is more closely associated with diabetic nephropathy and renal injury than diabetes itself [12,13].

PLR demonstrated a weak negative correlation with HbA1c. Previous studies investigating inflammatory markers in diabetes have reported inconsistent findings regarding PLR and glycemic control [8,11].

The most important finding of the present study was the significantly elevated NHR among diabetic patients. NHR combines inflammatory activity represented by neutrophils and the protective effects of HDL cholesterol.

Mazidi et al. demonstrated that elevated NHR is associated with metabolic syndrome and cardiometabolic risk [9]. Wu et al. reported significant associations between NHR and insulin resistance [10].

The elevated NHR observed in diabetic patients suggests that this marker reflects both inflammatory activation and impaired lipid metabolism.

Interestingly, inflammatory markers showed weak correlations with HbA1c. King et al. reported that inflammatory markers and glycemic control may represent related but distinct pathological processes in diabetes [15]. This study included both diabetic and non-diabetic participants and evaluated multiple inflammatory markers, including the novel neutrophil-to-HDL ratio (NHR), using routine and inexpensive laboratory tests. Additionally, it provides valuable regional data from the UAE population. The study was limited by its retrospective single-center design, moderate sample size, and lack of information on diabetes duration and body mass index. Importantly, data on medication

Table 1. *Demographic Characteristics of the Study Groups.*

Variable	T2DM (n=100)	Controls (n=100)	
Age (years)	52.66 ± 5.33	50.34 ± 6.24	0.156
Male, n (%)	60 (60%)	56 (56%)	0.571
Female, n (%)	40 (40%)	44 (44%)	0.571
BMI (kg/m²)	28.18 ± 2.32	21.80 ± 1.82	<0.001
Duration of diabetes (years)	12.0 ± 3.0	N/A	—
HbA1c (%)	8.53 ± 1.25	5.41 ± 0.27	<0.001
Total cholesterol (mg/dL)	230.38 ± 20.41	173.13 ± 21.63	<0.001
Triglycerides (mg/dL)	189.94 ± 30.22	136.34 ± 22.00	0.019
LDL-C (mg/dL)	167.09 ± 15.90	137.09 ± 11.90	0.034
HDL-C (mg/dL)	47.09 ± 11.90	56.19 ± 12.78	0.250

Table 2. *Comparison of Inflammatory Markers.*

Parameter	T2DM	Controls	p-value
NLR	1.89 ± 1.00	1.65 ± 0.82	0.076
MLR	0.245 ± 0.11	0.249 ± 0.09	0.843
PLR	108.01 ± 44.30	119.98 ± 48.10	0.055
NHR	0.10 ± 0.04	0.07 ± 0.03	<0.001

Table 3. *Correlation Between HbA1c and Inflammatory Markers.*

Marker	Correlation Coefficient (r)	p-value
NLR	−0.184	0.066
MLR	−0.149	0.139
PLR	−0.200	0.046
NHR	−0.133	0.191

use — including metformin, statins, and fibrates, all of which can independently influence inflammatory markers and lipid parameters such as HDL-C — were not available, and the analysis therefore could not adjust for these potential confounders. This is a significant limitation for a lipid-based index such as NHR in particular, since lipid-lowering therapy could plausibly attenuate or exaggerate the observed between-group difference. Prospective studies with linked clinical and pharmacy records, allowing multivariate adjustment for BMI, diabetes duration, and medication use, are needed to confirm whether the NHR elevation observed here persists independently of these factors.

The lack of a significant correlation between NHR and HbA1c suggests that these two markers capture distinct pathophysiological dimensions of T2DM — chronic glycemic exposure versus an inflammatory-lipid axis — rather than NHR simply tracking the degree of glycemic control; this distinction, rather than undermining NHR's utility, is consistent with it offering complementary rather than redundant information.

Conclusion.

NHR was significantly elevated among patients with T2DM and may represent a useful biomarker reflecting both metabolic and inflammatory disturbances.

NLR showed a tendency toward elevation, whereas MLR and PLR demonstrated limited clinical utility.

Future prospective studies with larger sample sizes are needed to establish the prognostic value of these inflammatory indices.

Acknowledgments.

The authors would like to thank Thumbay Laboratories and Gulf Medical University for their support and assistance during this study.

Conflict of Interest.

The authors declare no conflicts of interest.

Funding.

No external funding was received for this study.

Ethical Approval.

The study protocol was approved by the Gulf Medical University Institutional Review Board.

REFERENCES

1. International Diabetes Federation. IDF Diabetes Atlas. 11th ed. Brussels: International Diabetes Federation; 2025.
2. Donath MY, Shoelson SE. Type 2 diabetes as an inflammatory disease. Nat Rev Immunol. 2011;11:98-107.
3. Pickup JC. Inflammation and activated innate immunity in the pathogenesis of type 2 diabetes. Diabetes Care. 2004;27:813-823.
4. Wellen KE, Hotamisligil GS. Inflammation, stress, and diabetes. J Clin Invest. 2005;115:1111-1119.
5. American Diabetes Association. Classification and diagnosis of diabetes: Standards of Care in Diabetes—2024. Diabetes Care. 2024;47:S20-S42.
6. Sacks DB. Hemoglobin A1c in diabetes: panacea or pointless? Diabetes. 2013;62:41-43.
7. Forget P, Khalifa C, Defour JP, et al. What is the normal value of the neutrophil-to-lymphocyte ratio? BMC Res Notes. 2017;10:12.
8. Turan B, Atak B, Demir S, et al. A study of relationships between the HbA1c level and inflammatory markers, neutrophil-to-lymphocyte ratio, and monocyte-to-lymphocyte ratio in controlled and uncontrolled type 2 diabetes mellitus. J Clin Lab Anal. 2024.
9. Mazidi M, Katsiki N, Mikhailidis DP, et al. Neutrophil and monocyte ratios to high-density lipoprotein cholesterol and adiponectin as biomarkers of nascent metabolic syndrome. Metabolism. 2020;107:154193.
10. Wu MY, Chen YL, Tsai PS, et al. Association between neutrophil-to-HDL cholesterol ratio and insulin resistance in individuals with obesity. Diabetes Res Clin Pract. 2025.
11. Zhao X, Wang L, Chen Y, et al. Association between neutrophil-to-lymphocyte ratio and glycemic control in type 2 diabetes mellitus: an updated systematic review and meta-analysis. Diabetes Metab Syndr Obes. 2024.
12. Liu J, Wang H, Zhang Y, et al. Monocyte-lymphocyte ratio is a valuable predictor for diabetic nephropathy in patients with type 2 diabetes. Medicine (Baltimore). 2020;99:e20190.
13. Bilgin S, Aktas G, Zahid Kocak M, et al. Monocyte lymphocyte ratio as a predictor of diabetic kidney injury in type 2 diabetes mellitus: the MADKID study. Acta Diabetol. 2021;58:997-1002.
14. Li C, Zhou Q, Wang J, et al. The neutrophil-to-lymphocyte ratio predicts cardiovascular outcomes in patients with diabetes: a systematic review and meta-analysis. Cardiovasc Diabetol. 2024.
15. King DE, Mainous AG III, Buchanan TA, et al. C-reactive protein and glycemic control in adults with diabetes. Diabetes Care. 2003;26:1535-1539.