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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии
საქართველოს სამედიცინო სიახლეები

GEORGIAN MEDICAL NEWS

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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 ხიახლები – არის უფლებული სამეცნიერო სამედიცინო რევიუზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეცნიელების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რეცენზირდება ინგლისურ ენებზე ქვეყნება 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, применяющиеся 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 computer-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.

ავტორია საშურალებოდ!

რედაქტორი 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 ინგლისურნოვან ტექსტებში - **Times New Roman (Кириллицა)**, 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 სის და რეზიუმების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გამუქდება: 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, დანორმილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოსასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტ-სურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შედებვის 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, ურნალის დასახელება, გამოცემის ადგილი, წელი, ურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფრჩილებში 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 რეცეპტია, 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. რედაქტორი იტოვებს უფლებას შეასწოროს სტატიას. ტექსტშე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქტორი ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდიდად წარდგენილი იყო სხვა რედაქტორიაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

Содержание:

Yuliya Tyravtska, Dmytro Maltsev, Valentyna Moyseyenko, Vitalii Reshetyo, Volodymyr Yakymenko.	
IMMUNOMODULATORS IN THE TREATMENT OF ATHEROSCLEROSIS AND OTHER CHRONIC HEART DISEASES: PROSPECTS ANDRISKS.....	6-16
Aldabekova G, Khamidullina Z, Abdrashidova S, Musina A, Kassymbek S, Kokisheva G, Suleimenova Zh, Sarsenbieva A, Kamalbekova G. ASSESSMENT OF THE IMPLEMENTATION OF WHO INFECTION PREVENTION AND CONTROL (IPC) CORE COMPONENTS IN KAZAKHSTAN: FINDINGS BASED ON THE IPCAF TOOL.....	17-22
Madina Madiyeva, Gulzhan Bersimbekova, Gulnur Kanapiyanova, Mariya Prilutskaya, Aray Mukanova.	
ANALYSIS OF RISK FACTORS AND THEIR IMPACT ON BONE HEALTH STATUS IN KAZAKH POPULATIONS.....	23-30
Bilanishvili I, Barbakadze M, Nikabadze N, Andronikashvili G, Nanobashvili Z.	
AUDIOGENIC SEIZURE SUPPRESSION BY VENTRAL TEGMENTAL AREA STIMULATION.....	31-37
Yan Wang, Yulei Xie, Chong Yin, Qing Wu.	
EXPLORING THE MECHANISM OF ACTION OF HEMP SEEDS (CANNABIS SATIVA L.) IN TREATING OSTEOPOROSIS USING NETWORKPHARMACOLOGY.....	38-43
Marzhan Myrzakhanova, Gulshara Berdesheva, Kulsara Rustemova, Shynar Kulbayeva, Yuriy Lissitsyn, Zhuldyz Tleubergenova.	
TRANSFORMING MEDICAL EDUCATION IN KAZAKHSTAN: THE POTENTIAL OF VIRTUAL REALITY FOR ENHANCING THE LEARNING EXPERIENCE.....	44-51
Malinochka Arina D, Khupsergenov Emir Z, Avagyan Artyom A, Kurachenko Yulia V, Britan Inna I, Hvorostova Serafima V, Koipish Vladislav S, Siiakina Anastasiia E, Vasileva Vasilisa V, Mikheenko Diana D, Fomenko Danila A.	
LATE DIAGNOSIS OF ACROMEGALY IN THE SETTING OF A SOMATOPROLACTINOMA.....	52-54
Serhii Lobanov.	
ONTOGENETIC AND PSYCHOSOCIAL DETERMINANTS OF ADDICTIVE BEHAVIOR FORMATION AMONG UKRAINIAN YOUTH	55-62
Emzar Diasamidze, Tamaz Gvenetadze, Giorgi Antadze, Iamze Taboridze.	
THE IMPACT OF ANEMIA ON THE DEVELOPMENT OF INCISIONAL HERNIA, PROSPECTIVE STUDY.....	63-67
Karapetyan A.G, Ulusyan T.R, Danielyan M.H, Avetisyan E.A, Petrosyan A.A, Petrosyan S.S, Grigoryan V.S.	
RESEARCH OF HEMATOLOGICAL CHANGES IN INDIVIDUALS EXPOSED TO IRRADIATION FROM THE CHERNOBYL NUCLEAR POWER PLANT.....	68-71
Yaji Chen, Yin Wang.	
THE RELATIONSHIP BETWEEN SOCIAL CAPITAL AND WORKERS' MENTAL HEALTH IN CONTEMPORARY CHINA.....	72-78
Begaidarova R.Kh, Alshynbekova G.K, Kadyrova I.A, Alshimbayeva Z.Ye, Nassakayeva G.Ye, Zolotaryova O.A, Omarova G.M.	
CASE REPORT OF INFLUENZA A (H1N1) PDM 09 STRAIN / KARAGANDA/ 06/2022 IN A CHILD AGED 3 YEARS.....	79-86
Fahad Saleh Ayed AL-Anazi, Albadawi Abdelbagi Talha.	
ANTIBIOTICGRAM OF URINARY CATHETER-ASSOCIATED BACTERIAL PATHOGENS IN INTENSIVE CARE UNIT, KING KHALID GENERAL HOSPITAL, HAIFER AL-BATEN, SAUDI ARABIA.....	87-95
Serik Baidurin, Ybraim Karim, Akhmetzhanova Shynar, Tkachev Victor, Moldabayeva Altyn, Eshmagambetova Zhanna, Darybayeva Aisha.	
COEXISTENCE OF APLASTIC ANEMIA AND PAROXYSMAL NOCTURNAL HEMOGLOBINURIA: DIAGNOSTIC CHALLENGES AND THERAPEUTIC STRATEGIES - CASE REPORT.....	96-101
Liika Leshkasheli, Darejan Bolkvadze, Lia Askilashvili, Maria Chichashvili, Megi Khanishvili, Giorgi Tservadze, Nana Balarjishvili, Leila Kvachadze, Elisabed Zaldastanishvili.	
PHENOTYPIC CHARACTERIZATION OF FIVE PHAGES ACTIVE AGAINST ANTIBIOTIC-RESISTANT <i>KLEBSIELLA PNEUMONIAE</i>	102-112
Aliya Manzoorudeen, Marwan Ismail, Ahmed Luay Osman Hashim, Abdelgadir Elamin Eltom.	
ASSOCIATION BETWEEN GALECTIN-3 AND MICROVASCULAR COMPLICATIONS IN TYPE 2 DIABETES MELLITUS: A COMPARATIVE STUDY.....	113-119
Gulmira Derbissalina, Zhanagul Bekbergenova, Ayagoz Umbetzhanova, Gulsum Mauletbayeva, Gulnara Bedelbayeva.	
BIOMARKERS OF CARDIOMETABOLIC RISK IN PATIENTS WITH ARTERIAL HYPERTENSION: A CROSS-SECTIONAL PILOT STUDY.....	120-126
Madina Rashova, Saule Akhmetova, Berik Tuleubaev, Dinara Turebekova, Amina Koshanova, Adilet Omenov, Bakdaulet Kambyl, Yekaterina Kossilova.	
ASSESSMENT OF CLINICAL SYMPTOMS OF ACUTE TOXICITY FOLLOWING THE IMPLANTATION OF A NANOCELLULOSE-BASEDBIOCOMPOSITE.....	127-137
Dali Beridze, Mariam Metreveli, Avtandil Meskhidze, Galina Meparishvili, Aliosha Bakuridze, Malkhaz Jokhadze, Dali Berashvili, Lasha Bakuridze.	
STUDY OF THE BIOACTIVE COMPOUND COMPOSITION, ANTIMICROBIAL, AND CYTOTOXIC ACTIVITIES OF ENDEMIC PLANT SPECIES OF ADJARA-LAZETI.....	138-152

Faisal Younis Shah, Reece Clough, Fatima Saleh, Mark Poustie, Ioannis Balanos, Ahmed Najjar.	
FACTORS AFFECTING MORTALITY IN PATIENTS WITH HIP FRACTURES AND SHAH HIP FRACTURE MORTALITY SCORE: A RISK QUANTIFICATION TOOL.....	153-159
Anas Ali Alhur, Layan S. Alqahtani, Lojain Al Faraj, Duha Alqahtani, Maram Fahad, Norah Almoneef, Ameerah Balobaied, Rawan Alamri, Aseel Almashal, Fatimah Alkathiri, Lama Alqahtani, Lama Al-Shahrani, Hani Alasmari, Nouran Al Almaie, Sarah Alshehri.	
GLOBAL RESEARCH TRENDS IN MRI SAFETY AND PATIENT AWARENESS: A BIBLIOMETRIC ANALYSIS (2000–2025)...	160-167
Virina Natalia V, Kuchieva Lana M, Baturina Yulia S, Fizikova Aliya B, Gereeva Madina M, Bitiev Batraz F, Apakhaeva Karina K, Manukhova Natalia M, Rasulova Fatima Z, Kornev Egor M, Rodionova Ekaterina A.	
DANIO RERIO (ZEBRAFISH) - A UNIQUE AND INTEGRATIVE PLATFORM FOR 21ST CENTURY BIOMEDICAL RESEARCH.....	168-173
Salah Eldin Omar Hussein, Shamsa Murad Abdalla Murad, Ogail Yousif Dawod, Elryah I Ali, Shawgi A. Elsiddig, Rabab H. Elshaikh A, Awadh S. Alsuhbi, Tagwa Yousif Elsayed Yousif, Siednamohammed Nagat, Amin SI Banaga, Salah Y. Ali, Marwan Ismail, Ayman Hussien Alfeel.	
BIOCHEMICAL ASSOCIATION BETWEEN CALCIUM HOMEOSTASIS AND SERUM URIC ACID LEVELS IN PATIENTS WITH HYPOTHYROIDISM: A COMPARATIVE EVALUATION WITH 25-HYDROXYVITAMIN D.....	174-179
Markova OO, Safonchyk OI, Orlovska IH, Kovalchuk OM, Sukharieva AO, Myrza SS, Keidaluk VO.	
PROTECTION OF CONSUMER RIGHTS IN THE FIELD OF ELECTRONIC COMMERCE OF MEDICINES.....	180-187
Ilona Tserediani, Merab Khvadagian.	
ENDONASAL ENDOSCOPIC DACRYOCYSTORHINOSTOMY USING RADIOFREQUENCY (RF) IN CHRONIC ABSCESSSED DACRYOCYSTITIS: A PROSPECTIVE STUDY.....	188-189
Nadezhda Omelchuk.	
HYPERCORTICISM IN THE PATHOGENESIS OF ACUTE RADIATION SICKNESS AND CONDITIONS OF INCREASED RADIORESISTANCE.....	190-196
Anas Ali Alhur, Raghad Alharajeen, Aliah Alshabanah, Jomanah Alghuwainem, Majed Almukhlifi, Abdullah Al Alshikh, Nasser Alsubaie, Ayat Al Sinan, Raghad Alotaibi, Nadrah Alamri, Atheer Marzouq Alshammari, Nawal Alasmari, Deema Alqurashi, Shahad Alharthi, Renad Alosaimi.	
THE IMPACT OF VISION 2030 ON PHARMACY STUDENTS' CAREER OUTLOOKS AND SPECIALIZATION CHOICES: A CROSS-SECTIONAL ANALYSIS.....	197-203
Fitim Alidema, Arieta Hasani Alidema, Lirim Mustafa, Mirlinde Havolli, Fellenza Abazi.	
LDL-CHOLESTEROL LOWERING WITH ATORVASTATIN, ROSUVASTATIN AND SIMVASTATIN: RESULTS OF A RETROSPECTIVE OBSERVATIONAL STUDY.....	204-209
Ainur Amanzholkyzy, Yersulu Sagidanova, Edgaras Stankevicius, Ainur Donayeva, Ulziya Sarsengali.	
HEAVY METAL TOXICITY VERSUS TRACE ELEMENT PROTECTION IN WOMEN'S REPRODUCTIVE HEALTH - A SYSTEMATIC REVIEW.....	210-216
Marwan Ismail, Mutaz Ibrahim Hassan, Assiya Gherdaoui, Majid Alnaimi, Raghda Altamimi, Srija Manimaran, Mahir Khalil Jallo, Ramprasad Muthukrishnan, Praveen Kumar Kandakurthi, Jaborova Mehroba Salomudinovna, Shukurov Firuz Abdufattoevich, Shawgi A. Elsiddig, Tagwa Yousif Elsayed Yousif, Asaad Babker, Ahmed L. Osman, Abdelgadir Elamin.	
ASSOCIATION BETWEEN EXERCISE MODALITIES AND GLYCEMIC CONTROL IN TYPE 2 DIABETES.....	217-223
Tamar Zarginava, Zaza Sopromadze.	
THE PRIORITY OF CONTEMPORARY MEDICAL UNIVERSITY MODELS IN SUBSTANTIATING BENCHMARKING OF MARKETING SOCIO-ETHICAL STANDARDS.....	224-230
Svetlana Shikanova, Altnay Kabdygaliyeva.	
THE SIGNIFICANCE OF INTERLEUKIN-22 AND HOMOCYSTEINE IN THE PROGNOSIS OF PREMATURE ANTEPARTUM RUPTURE OF MEMBRANES IN PREGNANT WOMEN.....	231-242
Shahad A. Badr, Taqwa B. Thanoon, Zeina A. Althanoon, Marwan M. Merkhan.	
CHARACTERISTICS AND MANAGEMENT OF RESPIRATORY AILMENTS IN PAEDIATRICS: A PROSPECTIVE CLINICAL STUDY	243-247
Ulviiya Z. Nabizade, Orkhan Isayev, Gunel R. Haci, Kamal İ. Kazimov, Gulmira H. Nasirova, Rezeda R. Kaziyeva, Elchin H. Guliyev, Isa H. Isayev.	
EVALUATION OF THE DEEP INSPIRATION BREATH-HOLD TECHNIQUE TO IMPROVE DOSIMETRIC OUTCOMES IN RADIOTHERAPY FOR STAGE III NON-SMALL CELL LUNG CANCER.....	248-252
Galina Battalova, Yerkezhan Kalshabay, Zhamilya Zholdybay, Dinara Baigussova, Bolatbek Baimakhanov.	
NON-INVASIVE QUANTITATIVE CT PERfusion OF THE LIVER IN AUTOIMMUNE HEPATITIS.....	253-260
Lachashvili L, Khubua M, Jangavadze M, Bedinasvili Z.	
MiR-29a, miR-222 AND miR-132 IN THE BLOOD PLASMA OF PREGNANT WOMEN AS PREDICTORS OF GESTATIONAL DIABETES.....	261-265
Mohanad Luay Jawhar, Hadzliana Binti Zainal, Sabariah Noor Binti Harun, Baraa Ahmed Saeed.	
OMEGA-3 POLYUNSATURATED FATTY ACIDS AND HYPERTENSION: A REVIEW OF VASOACTIVE MECHANISMS AND IMPLICATIONS FOR CARDIOVASCULAR DISEASE.....	266-271

Dimash Davletov, Mukhtar Kulimbet, Indira Baibolsynova, Sergey Lee, Ildar Fakhraiyev, Alisher Makhmutov, Batyrbek Assembekov, Kairat Davletov.	
ESTIMATING THE PREVALENCE OF FAMILIAL HYPERCHOLESTEROLEMIA IN STROKE AND TRANSITORY ISCHEMIC ATTACK POPULATION: A SYSTEMATIC REVIEW AND META-ANALYSIS.....	272-281
Anas Ali Alhur, Abdullah Saeed, Anas Almalki, Hawra Alhamad, Hafez Meagammy, Norah Al Sharaef, Sarah Alakeel, Saeed Alghamdi, Abdulaziz Alqarni, Mohammed Alqarni, Muhannad Alshehri, Naif Alotaibi, Salman Almutairi, Rayan Alajhar, Adel Al-Harthi.	
IS HEALTH AT RISK? A QUANTITATIVE STUDY ASSESSING THE IMPACT OF EXCESSIVE MOBILE APPLICATION USE ON PHYSICAL AND MENTAL WELL-BEING AMONG ADULTS IN SAUDI ARABIA.....	282-288
Khatuna Kudava.	
ONYCHODYSTROPHIES IN PEDIATRIC DERMATOLOGY.....	289-292

LATE DIAGNOSIS OF ACROMEGALY IN THE SETTING OF A SOMATOPROLACTINOMA

Malinochka Arina D, Khupsergenov Emir Z, Avagyan Artyom A, Kurachenko Yulia V, Britan Inna I, Hvorostova Serafima V, Koipish Vladislav S, Siiakina Anastasiia E, Vasileva Vasilisa V, Mikheenko Diana D, Fomenko Danila A.

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Abstract.

Acromegaly is a chronic neuroendocrine disorder caused by excessive secretion of growth hormone and insulin-like growth factor-1, leading to systemic metabolic and organ dysfunction, substantial comorbidity, and an increased risk of premature mortality. This article presents a clinical case of a 47-year-old woman with a somatoprolactinoma in whom delayed diagnosis of acromegaly resulted in multiple complications. The disease began at a young age, manifesting as amenorrhea and progressive changes in appearance. Despite comprehensive treatment—including transsphenoidal adenomectomy, stereotactic radiosurgery (CyberKnife), and therapy with somatostatin analogues—sustained normalization of growth hormone, IGF-1, and prolactin levels was achieved; however, the patient continues to exhibit significant complications, including optic nerve atrophy, hypopituitarism, cardiomyopathy, and arthropathy. Immunohistochemical analysis was not performed at the initial surgery in 2004. However, in 2012, a re-evaluation of archival histological slides was conducted, including a complete immunohistochemical workup, which demonstrated strong expression of growth hormone and prolactin. Thus, the tumor was definitively classified as a pituitary somatoprolactinoma. This clinical case highlights the diagnostic and therapeutic challenges associated with acromegaly, the necessity of a multidisciplinary approach, the importance of early diagnosis, and the value of long-term dynamic follow-up of patients.

Key words. Acromegaly, IGF-1, growth hormone, prolactin, somatostatin analogues, transsphenoidal adenomectomy.

Introduction.

Acromegaly is a chronic heterogeneous disorder encompassing various clinical and pathomorphological subtypes of pituitary and extrapituitary neuroendocrine neoplastic lesions characterized by increased secretion of growth hormone and its mediator, insulin-like growth factor 1, in individuals who have completed physiological growth. Acromegaly is marked by an insidious course, delayed diagnosis, and high comorbidity. Prolonged, uncontrolled hypersecretion of proliferative hormones leads to progressive enlargement of the cellular mass of tissues and organs, phenotypic and structural dedifferentiation, and the development of combined systemic abnormalities and neoplastic processes, ultimately resulting in early disability, social isolation, and premature death [1-5].

The main clinical manifestations and complications of acromegaly include enlargement of the nose, lips, extremities, and soft tissues; prominent supraorbital ridges; and prognathism. In addition to external changes, the disorder is characterized by metabolic disturbances, including impaired glucose tolerance, insulin resistance, and dyslipidemia. Cardiovascular

involvement is substantial and includes arterial hypertension, arrhythmias, cardiomyopathy, and heart failure. Patients also frequently exhibit obstructive sleep apnea syndrome, arthropathy, paresthesias, and reproductive dysfunction, all of which collectively lead to reduced quality of life and premature mortality.

Objective and Aim. To present a clinical case of a 47-year-old woman with acromegaly and illustrate the features of the disease course, diagnostic challenges, and management strategy.

Case Presentation.

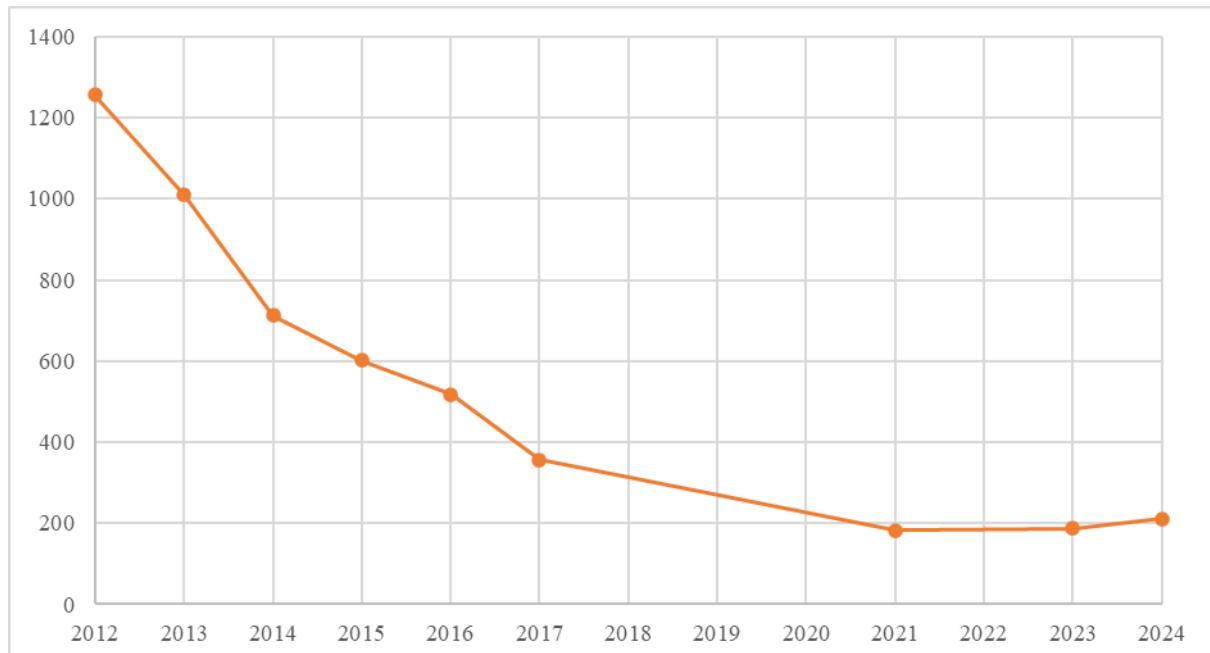
In 2012, archival pathological material underwent re-evaluation with IHC, which demonstrated strong expression of GH and prolactin, confirming somatoprolactinoma. Thus, the diagnosis of acromegaly was established only in 2012, eight years after the onset of characteristic symptoms.

In 2014, persistently elevated GH (5.5 ng/mL) and IGF-1 (712 ng/mL; reference 135–449 ng/mL) prompted an octreotide dose increase to 40 mg every 28 days. From 2012 to 2019, according to the patient, injections were irregular due to medication supply issues in her region. In 2014, neurosurgical evaluation concluded that repeat surgery was not feasible due to poor operative access and high bleeding risk.

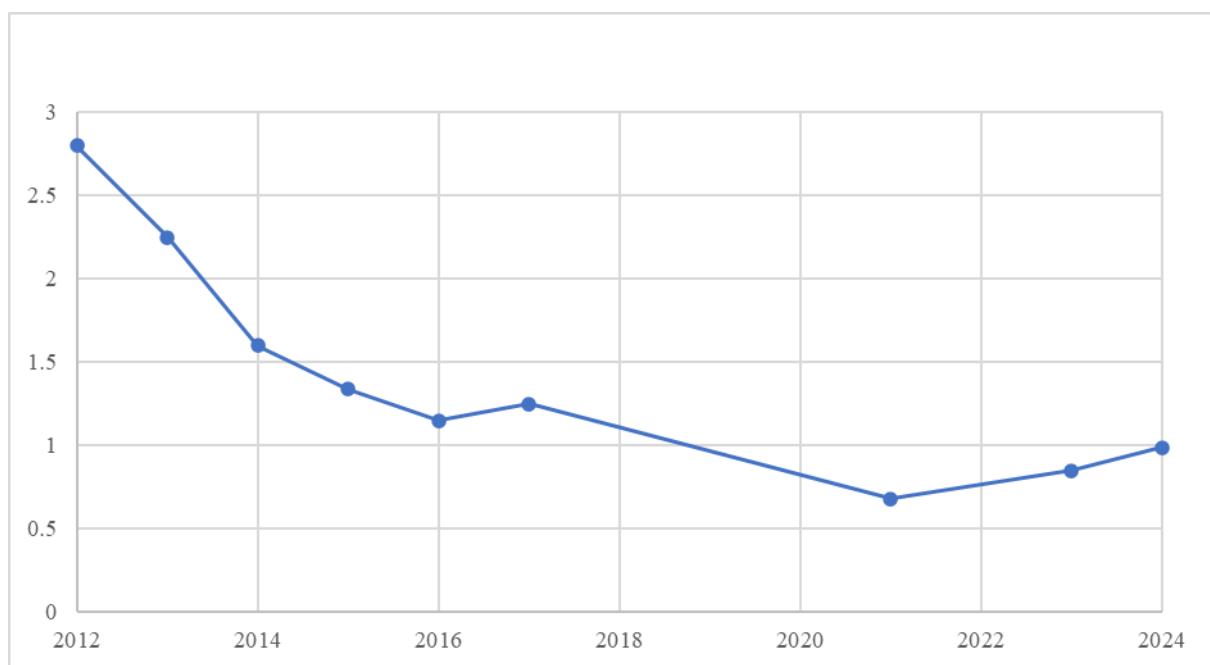
In March 2015, three sessions of stereotactic hypofractionated radiotherapy using bremsstrahlung beams on the CyberKnife system were performed (tumor volume 22 cm³). The procedure was complicated by complete right optic nerve atrophy and partial left optic nerve atrophy. Post-radiotherapy, partial lesion reduction was observed: tumor decreased from 33.6 × 29.9 × 17.5 mm (MRI 23 February 2015) to 26 × 25 × 14 mm (MRI 26 October 2015). Laboratory results from 13 June 2017 showed GH 1.018 ng/mL and IGF-1 356 ng/mL (reference 109–284 ng/mL). After relocating in 2019, the patient began receiving regular long-acting octreotide 40 mg every 28 days, achieving normalization of hormone levels: GH 0.98 ng/mL, IGF-1 182 ng/mL (reference 101–267 ng/mL) per laboratory testing during planned hospitalization in November 2021. Following radiotherapy and combined medical therapy (octreotide + cabergoline), the patient reported marked improvement: headaches resolved, no further visible progression of acromegalic appearance was observed, and clinical manifestations remained stable.

During a March 2023 hospitalization, GH was 0.54 ng/mL and IGF-1 186.7 ng/mL (reference 83.3–220 ng/mL), both within the reference range. An oral glucose tolerance test with GH measurement at five time points showed suppression to <1 ng/mL. Tumor size on MRI was 28 × 26 × 3.5 mm, without significant change. Given sustained hormonal control for two years on somatostatin analogue therapy, dose reduction to 20 mg every 28 days was recommended.

During hospitalization in November 2024, IGF-1 was 211 ng/



Graph 1. Dynamics of IGF-1 levels (ng/mL).



Graph 2. IGF-1 index (measured IGF-1 / upper limit of normal). Values >1.0 indicate elevation above the reference range.

mL (reference 73.8–214 ng/mL), showing an upward trend. Therefore, the patient was advised to resume octreotide 40 mg intramuscularly every 28 days, with subsequent IGF-1 monitoring and potential dose adjustment.

Discussion.

The presented clinical case illustrates a classical yet exceptionally severe course of acromegaly, attributable to delayed diagnosis and limited treatment availability. In this patient, late diagnosis resulted from multiple factors, including insufficient clinical vigilance regarding acromegaly and significant regional constraints. Living in an area with

limited access to specialized medical care meant that, in 2004, immunohistochemical (IHC) analysis could not be performed. The principal error at the initial stage was the interpretation of the condition as isolated prolactinoma. This conclusion was based solely on hyperprolactinemia and a biopsy description of “chromophobie adenoma,” without IHC confirmation or assessment of GH/IGF-1 levels, despite the presence of clinical features highly suggestive of acromegaly.

Retrospective evaluation helps explain why differential diagnosis was overlooked in 2004 when a “pituitary adenoma with hyperprolactinemia” was identified. The clinical picture was interpreted through the lens of the most common etiology—

prolactinoma. This assumption seemed to align with the patient's young age, initial amenorrhea, and markedly elevated prolactin. However, the presence of a macroadenoma with suprasellar extension and mass effect (headaches, early visual disturbances) should have prompted differential consideration of other adenoma subtypes, specifically:

1. Somatotrophinoma, characterized by concurrent clinical features of acromegaly and hyperprolactinemia;
2. Pituitary stalk compression syndrome, where tumor mass effect induces hyperprolactinemia.

Absence of targeted screening for acromegaly and failure to measure GH/IGF-1 in 2004 prevented appropriate differential diagnosis and led to the principal diagnostic error, causing an eight-year delay in establishing the correct diagnosis. This experience underscores that in any patient with a pituitary macroadenoma and hyperprolactinemia, less common but clinically significant tumor variants must be actively considered.

The diagnosis was ultimately confirmed by a combination of clinical, laboratory, and imaging findings. The patient exhibited classical manifestations: progressive coarsening of facial features, soft-tissue thickening, malocclusion, headaches, arthralgias, paresthesias, secondary amenorrhea, hyperprolactinemia, and markedly elevated GH and IGF-1. A decisive factor was the IHC evaluation performed in 2012, which definitively confirmed the diagnosis.

Clinical improvement observed after 2015 resulted from multimodal therapy: the residual effects of radiation therapy combined with sustained medical treatment produced durable hormonal normalization and stabilization of symptoms. This emphasizes the importance of an integrated therapeutic strategy in managing GH- and prolactin-secreting pituitary adenomas.

The differential diagnosis also considered isolated prolactinoma, other hormonally active pituitary adenomas, multiple endocrine neoplasia type 1 (MEN1), rare genetic syndromes, familial isolated acromegaly, and hypothyroidism. Hypothyroidism was excluded because, although it may mimic certain features of acromegaly—skin thickening, facial puffiness, macroglossia, daytime somnolence, vocal coarseness—thyroid function tests (TSH and free T4) were normal. MEN1 was ruled out due to the absence of parathyroid disease and pancreatic neuroendocrine tumors, lack of family history, and negative MEN1 gene testing. Familial isolated acromegaly was excluded based on the absence of similar cases among relatives, older age of onset compared with typical familial presentation (usually in the 20–30s), and absence of AIP gene mutations.

This patient represents a severe clinical phenotype due to both the large, aggressively growing, invasive adenoma and multiple complications from long-standing uncontrolled GH/IGF-1 hypersecretion. Complications included significant visual impairment up to optic nerve atrophy, long-standing amenorrhea, metabolic disturbances, cardiovascular involvement, and consequences of radiation therapy.

The multistep nature of her treatment reflects the complexity of care and the necessity for a multidisciplinary approach involving endocrinologists, neurosurgeons, radiation oncologists, ophthalmologists, and cardiologists.

Despite improvements in diagnostic methods and clinical surveillance, the pre-diagnostic interval for acromegaly has not substantially changed over recent decades and averages 5–14 years in various national registries. In 54% of patients, this period exceeds 10 years, and in 37% exceeds 15 years [4]. This case vividly demonstrates the issue: despite clear clinical manifestations in 2004, the diagnosis of acromegaly was not made until 2012. This highlights the urgent need to increase awareness of acromegaly among primary care providers, particularly in patients with pituitary macroadenomas and even subtle signs of the disease [5].

Common causes of delayed diagnosis include low disease awareness among primary care physicians, the often-slow progression of clinical signs, the multisystem nature of manifestations, the predominance of mild forms (micromegaly), and insufficient implementation of screening programs.

In summary, this case underscores the critical importance of early diagnosis and timely initiation of optimal therapy for acromegaly. Despite modern therapeutic options, the patient continues to experience substantial complications, emphasizing the significant social and medical burden of this condition and the necessity for long-term dynamic follow-up.

Conclusion.

This case demonstrates a typical yet extremely severe course of acromegaly driven by delayed diagnosis, aggressive tumor growth, and the development of numerous complications. Although the patient underwent surgical, radiation, and medical therapy, she continues to experience substantial long-term consequences that markedly impair quality of life. Achieving durable remission is possible only with regular and appropriate treatment, underscoring the crucial importance of early detection and timely selection of optimal management strategies. This case highlights the need for comprehensive differential diagnosis in all patients with pituitary macroadenomas and hyperprolactinemia, as well as the importance of active multidisciplinary management and ensuring access to specialized care and medications for patients with acromegaly.

REFERENCES

1. Pronin V.S, Astafyeva L.I. Problems of diagnosis and treatment of acromegaly. Endocrinology: News, Opinions, Training. 2022;11.
2. Ametov A.S, Pronin V.S. Pierre Marie's disease: history and present. Endocrinology: News, Opinions, Training. 2017;6.
3. Andersen M, Hagen C, Frystyk J, et al. Development of acromegaly in patients with prolactinomas. Eur J Endocrinol. 2003;149:17-22.
4. Zarool-Hassan R, Conaglen HM, Conaglen JV, et al. Symptoms and signs of acromegaly: an ongoing need to raise awareness among healthcare practitioners. J Prim Health Care. 2016;8:157-163.
5. Nachtigall LB. Acromegaly diagnosed in a young woman presenting with headache and arthritis. Nat Clin Pract Endocrinol Metab. 2006;2:582-587.