

# GEORGIAN MEDICAL NEWS

ISSN 1512-0112

NO 2 (347) Февраль 2024

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 ВИНТИ 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 ВИНТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

### WEBSITE

[www.geomednews.com](http://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](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. Корректур авторам не высылаются, 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.nlm.nih.gov/bsd/uniform_requirements.html)  
[http://www.icmje.org/urm\\_full.pdf](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 საქურაღებოლ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დაიცვათ 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. რენტგენოგრაფიების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შედეგების 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 ფხიხლებში 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.

Yu-Ri Choi, Su-Bin Yu, Seoul-Hee Nam. ANTIBACTERIAL EFFECT OF CRATAEGUS PINNATIFIDA EXTRACT AGAINST ENTROCOCCUS FAECALIS A ROOT CANAL DISEASE-CAUSING BACTERIA.....	6-10
Larisa Melia, Revaz Sulukhia, Lali Pkhaladze, Nino Davidova, Archil Khomasuridze. MIFEPRISTON IN OBSTETRICS – WHY NOT?.....	11-14
Maryna Stoliarchuk. CORRELATION BETWEEN TRANSVERSE CEPHALOMETRIC PARAMETERS AND THE SEVERITY OF SKELETAL MALOCCLUSIONS.....	15-18
Deepak, Prashant Rao, Archana, Sowmya M, Sandeep. S, Suma S. A CROSS-SECTIONAL STUDY ON COVID-19 VACCINATION HESITATION AMONG UNIVERSITY STUDENTS.....	19-23
Tchernev G, Broshtilova V, Ivanov L, Alexandrov A, Smilov N, Kordeva S. DRUG RELATED NITROSOGENESIS, PHOTOCARCINOGENESIS AND ONCOPHARMACOGENESIS OF NODULAR MELANOMA: A CASE RELATED ANALYSIS CONCERNING THE POLYCONTAMINATION OF THE POLYMEDICATION WITH VALSARTAN/ HYDROCHLOROTHIAZIDE AND BISOPROLOL.....	24-27
Rawaa J. Matloob, Zeina A. Althanoon, Saad A. Algburi, Mudheher I. Salih, Marwan M. Merkhan. UPDATE ON THE USE OF METHOTREXATE IN THE MANAGEMENT OF RHEUMATOID ARTHRITIS.....	28-33
Georgi Tchernev. (N-NITROSO) PROPAPENONE INDUCED ADVANCED NODULAR MELANOMA-FIRST REPORTED CASE IN THE WORLD LITERATURE: THE INEXTRICABLE LINKS BETWEEN THE PHOTOCARCINOGENESIS, DRUG RELATED NITROSOGENESIS AND PHARMACO-ONCOGENESIS.....	34-37
Elham M. Mahmood, Entedhar R. Sarhat, Maryam T. Tawfeq, Siham A. Wadee. HISTOLOGICAL AND BIOCHEMICAL STUDY OF THE EFFECT OF FEXOFENADINE ON SALIVARY GLAND IN RATS.....	38-40
Valerii Vovk, Igor Duda, Alla Vovk. THE EFFECT OF A MULTIMODAL APPROACH ON THE RESULTS OF TREATMENT IN SURGERY: INTEGRATION OF CHEMOTHERAPY, SURGERY, AND RADIOTHERAPY.....	41-46
Haitham Alhussain, Deepak, Bharath Chandra V, Lakshmi. R, Sumana A, Jishamol KR. EXAMINATION OF THE INCIDENCE OF POOR SLEEP QUALITY AND FACTORS ASSOCIATED FOR POOR SLEEP DURING THE VARIOUS PHASES OF PREGNANCIES.....	47-53
N. Ksajikyan, H. Aghababyan, M. Sargsyan. ASSESSMENT OF REACTIVITY TO THE BODY UNDER CONDITIONS OF PHYSICAL ACTIVITY IN STUDENTS AGED 17-20 YEARS....	54-58
Abinaya Srinivasa Rangan, Dhanush Balaji.S, Utham Chand, Raghunathan E.G, Deepthi.N, Prasanna Karthik.S. TRIGLYCERIDE – GLUCOSE INDEX, REMNANT CHOLESTEROL AND COMMON CAROTID ARTERY INTIMA-MEDIA THICKNESS AS AN ATHEROSCLEROTIC MARKER IN ISCHEMIC STROKE PATIENTS.....	59-65
Riyam AH. Al-Barwani, Entedar R. sarhat. BREAST CANCER-MODULATED OMENTIN AND VASPIN PLASMA LEVELS.....	66-69
Tchernev G, Dimova D. PERIOULAR HIGH RISK BCCS AFTER ADDITIONAL/PARALLEL INTAKE OF TORASEMIDE, MOXONIDINE AND MIRABEGRON: IMPORTANT LINKS TO SKIN CANCER RELATED (PHOTO-) NITROSOGENESIS IN THE CONTEXT OF PHARMACO-ONCOGENESIS.....	70-76
Abinaya Srinivasa Rangan, Dhanush Balaji.S, Saranya.C, Raghunathan E.G, Deepthi.N, Prasanna Karthik.S. ASSOCIATION OF MPV AND RDW WITH DISEASE ACTIVITY IN PATIENT WITH RHEUMATOID ARTHRITIS.....	77-81
Julieta Nino Gulua, Lela Sturua, Maia Khubua, Lela Shengelia. THYROID CANCER AS A PUBLIC HEALTH CHALLENGE IN GEORGIA.....	82-86
Rahma S. Almallah, Hani M. Almkhtar. MIRABEGRON INDUCED RELAXATION OF ISOLATED BOVINE CORONARY SEGMENTS: ROLE OF NO AND K+ CHANNEL.....	87-92
Gogotishvili Mariam, Gogebashvili Nino, Bakradze Mzia, Gorgiladze Tinatin, Japaridze Fridon. MANIFESTATIONS OF DISEASES OF THE ORAL MUCOSA OF PATIENTS IN THE ADJARA REGION DURING THE COVID-19 PANDEMIC.....	93-95
Nithesh Babu R, Fathima S Nilofar, Saranya Palanisamy, Gnanadeepan T, Mahendra Kumar K. EXPLORING THE INCIDENCE AND PREVALENCE OF NEW-ONSET AUTOIMMUNE DISEASE FOLLOWING COVID-19 PANDEMIC: A SYSTEMATIC REVIEW.....	96-103

E. Mosidze, A. Chikovani, M. Giorgobiani. ADVANCES IN MINIMALLY INVASIVE SURGERY FOR PECTUS EXCAVATUM: ENHANCING OUTCOMES AND PATIENT CARE.....	104-107
Nithesh Babu R, Fathima S Nilofar, Saranya Palanisamy, Gnanadeepan T, Mahendra Kumar K. SIGNIFICANCE OF NEUTROPHIL-LYMPHOCYTE RATIO AND PLATELETLYMPHOCYTE RATIO AS PROGNOSTIC MARKERS OF DISEASE SEVERITY IN SYSTEMIC LUPUS ERYTHEMATOSUS.....	108-112
Athraa E. Ahmed, Nibras H. Hameed. PREVALENCE OF FETAL CONGENITAL ANOMALIES IN PATIENTS ATTENDING TIKRIT TEACHING HOSPITAL.....	113-116
Kazantcev A.D, Kazantceva E.P, Sarkisyan I.P, Avakova A.E, Shumakova A.O, Dyachenko Y.E, Mezhenko D.V, Kustov Y.O, Makarov Daniil Andreevich, Guliev M.T, Babaeva M.M. COMPARATIVE ANALYSIS OF POSITIVE AND NEGATIVE EXPECTATIONS WITH CONTROL OF VOLITIONAL EFFORT IN YOUNG AND OLD AGES AS RISK FACTORS OF SOCIAL AGING.....	117-121
Arnab Sain, Sarah Arif, Hoosai Manyar, Nauman Manzoor, Kanishka Wattage, Michele Halasa, Arsany Metry, Jack Song Chia, Emily Prendergast, Ahmed Elkilany, Odiamehi Aisabokhale, Fahad Hussain, Zain Sohail. CURRENT CONCEPTS IN THE MANAGEMENT OF BOXER'S FRACTURE.....	122-124
Gonashvili Meri, Kilasonia Besarion, Chikhladze Ramaz, Merabishvili Gela, Beriashvili Rusudan. MEDICO-LEGAL APPLICATIONS OF FRACTURE HEMATOMA: REVIEW.....	125-130
Zynab J. Jarjees, Entedhar R. Sarhat. ASSESSMENT OF OSTEOPONTIN, SCLEROSTIN, AND OSTEOCALCIN LEVELS IN PATIENTS WITH HYPOTHYROIDISM ON MEDICAL THERAPY.....	131-135
Tchernev G, Dimova D. EDUCATION FROM DERMATOLOGISTS: THE SIMULTANEOUSLY DEVELOPMENT OF 16 KERATINOCYTIC CANCERS AFTER USE OF METFORMIN IN COMBINATION WITH LOSARTAN/ HYDROCHLOROTHIAZIDE, METOPROLOL AND NIFEDIPINE-IMPORTANT LINKS TO DRUG RELATED (PHOTO)-NITROSO-CARCINOGENESIS AND ONCOPHARMACOGENESIS.....	136-141
Ismayilov M.U, Polukhov R.Sh, Poddubny I.V, Magammedov V.A. COMPARATIVE ASSESSMENT OF SURGICAL TREATMENT OF COMPLICATIONS OF ULCERATIVE COLITIS IN CHILDREN.....	142-148
Arnab Sain, Arsany Metry, Nauman Manzoor, Kanishka Wattage, Ahmed Elkilany, Michele Halasa, Jack Song Chia, Sarah Arif, Fahad Hussain, Odiamehi Aisabokhale, Zain Sohail. THE ROLE OF DISTAL LOCKING IN INTRAMEDULLARY NAILS FOR HIP FRACTURE FIXATION: A REVIEW OF CURRENT LITERATURE.....	149-150
Buba Chachkhiani, Manana Kalandadze, Shalva Parulava, Vladimer Margvelashvili. EFFECT OF SURFACE ABRASION AND TEMPERATURE TREATMENT ON METASTABLE TETRAGONAL ZIRCONIUM DIOXIDE (EXPERIMENTAL STUDY).....	151-155
Abdulrahman A Abdulhamed, Luma W Khaleel. CARDIOPROTECTIVE EFFECT OF GLYCYRRHIZA GLABRA EXTRACT AND GLYCYRRHIZA GLABRA SILVER NANOPARTICLE AGAINST ALLOXAN AND NICOTINAMIDE INDUCED DIABETIC CARDIAC INJURY IN RATS.....	156-159
Larysa Pentiuk, Tetiana Niushko, Emiliia Osiadla. FEATURES OF BLOOD PRESSURE DAILY MONITORING INDICATORS, STRUCTURAL AND FUNCTIONAL CHANGES OF THE LEFT VENTRICLE AND VESSELS IN WOMEN WITH HYPERTENSION II STAGE OF DIFFERENT REPRODUCTIVE AGE AND THEIR RELATIONSHIP WITH SEX HORMONES LEVEL.....	160-167
Rana dawood Salman Al-kamil, Thamiir F. Alkhiat, H. N. K. AL-Saman, H. H. Hussein, Dawood Chalooob Hilyail, Falah Hassan Shari. THE EFFECT OF NUTRITIONAL GENOMICS ON CARDIOVASCULAR SYSTEM.....	168-176
Sopiko Kvaratsthelia. PREVALENCE OF DENTITION, DENTAL ARCHES AND DENTAL ANOMALIES.....	177-180
Dorosh D, Liadova T, Popov M, Volobuieva O, Pavlikova K, Tsivenko O, Chernuskiy V, Hrek I, Kushnir V, Volobuiev D. THE EFFECT OF MELATONIN ON THE SERUM LEVEL OF INTERLEUKIN 31 IN HERPESVIRUS SKIN DISEASES ON THE BACKGROUND OF HIV.....	181-184

## CURRENT CONCEPTS IN THE MANAGEMENT OF BOXER'S FRACTURE

Arnab Sain, Sarah Arif, Hoosai Manyar, Nauman Manzoor, Kanishka Wattage, Michele Halasa, Arsany Metry, Jack Song Chia, Emily Prendergast, Ahmed Elkilany, Odiamehi Aisabokhale, Fahad Hussain, Zain Sohail.

*Worthing Hospital, University Hospitals Sussex NHS Foundation Trust, United Kingdom.*

### Abstract.

Fractures of the metacarpal particularly the 5<sup>th</sup> metacarpal is quite common among all hand fractures and has a high incidence in male adult population. Proper management of these fractures plays a key role in rehabilitation and early return to work thus reducing the economic burden. Treatment of these injuries depends on the type of injury: whether it is a closed/open fracture, degree of angulation at the fracture site and also mal-rotation and shortening of the finger. Non-operative management is suitable for fractures which are closed, non-displaced and without angulation or rotation. Open fractures, fractures with angulation and/or mal-rotation and fractures with neuro-vascular injury are more suitable for operative management. The acceptable angulation for conservative management for most studies is 70 degrees. Buddy strapping with a Futura splint provides good functional results. In fractures requiring operative intervention, K-wire fixation is a minimally invasive method of fixation, which in most cases has good functional results. Plate and screw fixation, however, is preferred for cases with significant comminution or multiple metacarpal fractures.

**Key words.** Boxer's fracture, Metacarpal fracture, K-wire, Plate, Plateintra-medullary fixation.

### Introduction.

Among all the fractures occurring in the hand metacarpal fractures are quite common and they constitute 40% of all hand fractures [1]. Metacarpal fractures most often happen in young active male population leading to loss of time from work leading to a high economic burden. Proper management of these fractures plays an important role in the rehabilitation of these young working population and helps in early return to work. Studies have shown that if these injuries are not managed properly can lead to loss of livelihood and economic burden particularly among working population [2].

A Boxer's fracture is a fracture at the neck of the 5<sup>th</sup> metacarpal which occurs most commonly after a direct trauma to a clenched fist. Treatment of these injuries depends on the type of injury: whether it is a closed/open fracture, degree of angulation at the fracture site and also mal-rotation and shortening of the finger. Non-operative management is suitable for fractures which are closed, non-displaced and without angulation or rotation. Open fractures, fractures with angulation and/or mal-rotation and fractures with neuro-vascular injury are more suitable for operative management. Open fractures have a tendency to become infected leading to loss of hand function and high morbidity. Fracture with malrotation and angulation with shortening leads to loss of hand function due to loss of hand cascade effect and also cosmetic deformity [3].

### Etiology.

A boxer's fracture most commonly occurs as a result of direct trauma to a clenched fist (boxing injury), due to which the energy is transferred through the fifth metacarpal bone axially, leading to dorsal angulation at the fracture site due to pull of interosseous muscles. The injury most commonly affects young adult male population [3,4].

### Immediate Management.

The clinician should do a thorough inspection of the hand during the initial assessment to check for hand alignment, bite marks (fight bites), neurovascular status, rotational deformity, and pseudo-clawing. The function of the hand should be evaluated to check for any tendon damage as tendons are also sometimes damaged during the injury [5]. The neurovascular bundle runs adjacent to the metacarpal bone may become damaged in displaced and angulated fractures and in these cases, surgical treatment is the mainstay. Fight bites have a high incidence of infection and require early washout and debridement along with antibiotics & tetanus prophylaxis is required as infection may lead to osteomyelitis and eventually need for amputation and also risk of tetanus [6].

In angulated fractures, a closed reduction can be attempted in the Accident & Emergency department under local anaesthesia with the use of the JAHSS manoeuvre, with metacarpophalangeal and interphalangeal joints flexed to 90 degree and pressure applied to the dorsal aspect of metacarpal head to flatten the fracture angulation [7]. Although the initial reduction may be successful, one study showed that maintenance of reduction by this technique is an issue [8].

Plain X rays in antero-posterior, lateral and oblique views are the gold standard in diagnosis and determination of degree of angulation and displacement. The normal angulation of fifth metacarpal is 15 degrees, so the angulation greater than the baseline of 15 degrees should be measured [3,4]. Kocaoğlu et al suggested the use of ultrasound to detect metacarpal fractures in the emergency department to reduce the requirement of X rays for suspected metacarpal fractures [9]. CT scanning is helpful in detecting occult metacarpal fractures when the fracture is not visible on plain X-rays [10].

### Non-Operative Management.

Non-operative management is the preferred mode of treatment for fractures which are closed, not angulated and not malrotated. These fractures can be managed either with an ulnar gutter splint [3] or buddy strapping in uncomplicated cases [11]. Previous literature studies recommend that the preferred position of the hand for fracture splinting is 20-degree extension at the wrist, 60–70-degrees flexion at the metacarpophalangeal (MCP) joint and extension at the interphalangeal joints [12]. Buddy strapping



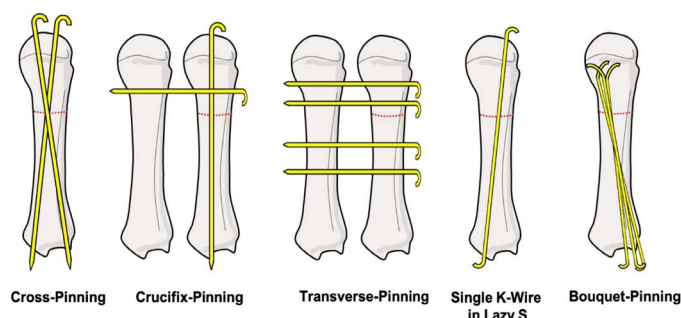
also reduces the risk of rotational deformity [8]. Some studies have found that the functional outcome with buddy strapping and ulnar gutter splint are similar [13,14]. The study by Bansal et al found that when buddy strapping was used patients had more satisfaction and shorter follow-up period [14]. A few studies have recommended an acceptable angulation up to 70 degrees for 5<sup>th</sup> metacarpal fractures [15,16]. However, one study by Ali et al showed 8% reduction in strength of flexor digiti minimi and 22% reduction in range of motion associated with 30 degrees of angulation [17]. The acceptable angulation is greater for the ulnar digits as there is more compensatory movement of the 4<sup>th</sup> and 5<sup>th</sup> Metacarpal joints [3].

### Operative Management.

There are a number of indications for operative management of 5<sup>th</sup> metacarpal fractures [4]. These include open fracture, intra-articular fractures, multiple metacarpal fractures, fractures extending to the metacarpal head with > 1 mm displacement, volar angulation & displacement of distal fragment, shortening >5mm, non-union, malunion, rotational deformity and failure of non-operative methods. Operative management is rapidly evolving and there are various methods of operative fixation like Kirshner wires (K-wires), plate and screws and intra-medullary fixation.

### K-Wire Fixation.

K-wire fixation is a minimally invasive mode of fixation for both closed and open metacarpal fractures [4]. The K-wire should pass the fracture site at an angle more than 45 degree [18]. The K wire can be used in the following ways to fix metacarpal fractures (Figure 1).



**Figure 1.** Methods of K-wire fixation in metacarpal fractures.

1. Cross-pinning: In this technique two K-wires, are advanced in a retrograde fashion across the fracture site to control rotation.

2. Crucifix pinning: This technique involves one K wire inserted through the metacarpal head into the intra-medullary canal and another K wire passed through the metacarpal head into the adjacent metacarpal. The two wires should sit at right angles to each other [4].

3. Transverse pinning: This technique is mainly used in fourth and fifth metacarpal fractures, in which the K-wire is driven from the ulnar aspect of the fractured metacarpal to its unfractured counterpart to stabilize the fracture. Two studies

have shown that when compared to intra-medullary pinning, this technique had favourably shorter operating times and fewer complications. However, reduced functional outcomes were noted [19,20].

4. Single K wire in lazy S fashion: A single K-wire with two bends (one mild bend at 5 mm and another smoother bend along the whole wire) inserted in an antegrade fashion into the medullary canal [21].

5. Bouquet pinning: This technique involves inserting 3 K wires in antegrade fashion into the metacarpal canal. The K wires should have a dorsal bend to hold the reduction [4].

The benefits of K-wire fixation include the minimal invasive technique of fracture fixation [4] and gives a good range of motion of 97.7 % when compared to the non-injured side [22].

The drawbacks of this method of fixation are reduced stability if extensive comminution of fracture is present [23], high incidence of pin-site infection [24], potential chance of mal-union/non-union [25] and incidence of tendon adhesion and joint contracture as a result of prolonged immobilization [2].

### Intra-medullary Fixation.

Intramedullary fixation of fifth metacarpal fractures can be achieved by

1. Pre-fabricated intra-medullary nail inserted in the antegrade fashion [23].

2. Headless screw inserted through the metacarpal head in retrograde fashion [2].

Comparative studies with K-wire fixation vs intramedullary fixation have proved that intra-medullary fixation resulted in improved range of motion and lower incidence of shortening [2]. Headless screws are usually inserted by retrograde fashion through the metacarpal head, through a small incision at the metacarpophalangeal joint over a retrograde guide wire inserted into the distal fragment. The head of the screw is buried inside the bone cortex, which avoids the need for removal in future. Comparative studies have shown that both K-wire fixation and headless screw fixation have similar biomechanical stability [26].

### Plate and Screw Fixation.

Plate and screw fixation is a very efficient method of fixation of metacarpal fractures. This is most profound in cases with significant comminution or multiple metacarpal fractures [4,2]. However, in cases with a small distal fragment, the fixation might result in instability. This method of fixation can also be associated with stiffness and extensor mechanism problems [2]. In a study by Facca et al comparing locking plates vs K-wire stabilization, it was found that the locking plate offers the benefit of immediate mobilization while K-wires require six weeks of immobilization [22].

### Discussion of current trends.

As per recent studies, uncomplicated 5<sup>th</sup> metacarpal fractures are treated with immobilization with splinting. Fractures with displacement can be managed either with closed reduction and splinting or surgical management. Surgical management is specifically indicated in situations like open fracture, intra-articular fractures, multiple metacarpal fractures, fractures extending to the metacarpal head with > 1 mm displacement,

volar angulation & displacement of distal fragment, shortening >5mm, non-union, malunion, rotational deformity and failure of non-operative methods. With respect to method of operative fixation, locking plates have become the current trend compared to K-wires as locking plates offer stable fixation and immediate post-op mobilization which is crucial in hand surgery [3,4].

### Conclusion.

The recent studies show that there is still no clear consensus as to the single most effective treatment for boxer's fractures. In cases where the fracture is closed, stable with no nerve or blood vessel injury, conservative treatment is preferred. The acceptable angulation for conservative management for most studies is 70 degrees. Buddy strapping with a Futura splint provides good functional results. In fractures requiring operative intervention, K-wire fixation is a minimally invasive method of fixation, which in most cases has good functional results. Plate and screw fixation, however, is preferred for cases with significant comminution or multiple metacarpal fractures.

---

### REFERENCES

1. de Jonge JJ, Kingma J, van der Lei B, et al. Fractures of the metacarpals. A retrospective analysis of incidence and aetiology and a review of the English-language literature. *Injury*. 1994;25:365-369.
2. Padeigimas EM, Warrender WJ, Jones CM, et al. Metacarpal neck fractures: a review of surgical indications and techniques. *Arch Trauma Res*. 2016;5:e32933.
3. Malik S, Herron T, Rosenberg N. Fifth Metacarpal Fractures (Boxer's Fracture). 2020.
4. Hussain MH, Ghaffar A, Choudry Q, et al. Management of Fifth Metacarpal Neck Fracture (Boxer's Fracture): A Literature Review. *Cureus*. 2020;12.
5. Alton S, Carayannopoulos N. Hand Injuries: Boxer Fractures and Fight Bites. *J Nurse Practitioners*. 2019;15:334-338.
6. Mennen U, Howells CJ. Human fight-bite injuries of the hand. A study of 100 cases within 18 months. *J Hand Surg Br*. 1991;16:431-435.
7. Jahss SA. Fractures of the metacarpals: a new method of reduction and immobilization. *J Bone Jt Surg*. 1938;20:178-86.
8. Haughton D, Jordan D, Malahias M, et al. Principles of hand fracture management. *Open Orthop J*. 2012;6:43-53.
9. Kocaoğlu S, Özhasenekler A, İçme F, et al. The role of ultrasonography in the diagnosis of metacarpal fractures. *Am J Emerg Med*. 2016;34:1868-71.
10. Hindman BW, Kulik WJ, Lee G, et al. Occult fractures of the carpals and metacarpals: demonstration by CT. *AJR Am J Roentgenol*. 1989;153:529-532.
11. Pellatt R, Fomin I, Pienaar C, et al. Is buddy taping as effective as plaster immobilization for adults with an uncomplicated neck of fifth metacarpal fracture? A randomized controlled trial. *Ann Emerg Med*. 2019;74:88-97.
12. McNemar TB, Howell JW, Chang E. Management of metacarpal fractures. *J Hand Ther*. 2003;16:143-151.
13. Kollitz KM, Hammert WC, Vedder NB, et al. Metacarpal fractures: treatment and complications. *Hand (N Y)*. 2014;9:16-23.
14. Bansal R, Craigen MA. Fifth metacarpal neck fractures: is follow-up required?. *J Hand Surg Eur Vol*. 2007;32:69-73.
15. Stadius Muller MG, Poolman RW, van Hoogstraten MJ, et al. Immediate mobilization gives good results in boxer's fractures with volar angulation up to 70 degrees: a prospective randomized trial comparing immediate mobilization with cast immobilization. *Arch Orthop Trauma Surg*. 2003;123:534-537.
16. Kollitz KM, Hammert WC, Vedder NB, et al. Metacarpal fractures: treatment and complications. *Hand (N Y)*. 2014;9:16-23.
17. Ali A, Hamman J, Mass DP. The biomechanical effects of angulated boxer's fractures. *J Hand Surg Am*. 1999;24:835-844.
18. Kamath JB, Harshvardhan, Naik DM, et al. Current concepts in managing fractures of metacarpal and phalanges. *Indian J Plast Surg*. 2011;44:203-211.
19. Galal S, Safwat W. Transverse pinning versus intramedullary pinning in fifth metacarpal's neck fractures: a randomized controlled study with patient-reported outcome. *J Clin Orthop Trauma*. 2017;8:339-343.
20. Winter M, Balaguer T, Bessière C, et al. Surgical treatment of the boxer's fracture: transverse pinning versus intramedullary pinning. *J Hand Surg Eur Vol*. 2007;32:709-713.
21. Boussakri H, Elidrissi M, Azarkane M, et al. Fractures of the neck of the fifth metacarpal bone, treated by percutaneous intramedullary nailing: surgical technique, radiological and clinical results study (28 cases). *Pan Afr Med J*. 2014;18:187.
22. Facca S, Ramdhian R, Pelissier A, et al. Fifth metacarpal neck fracture fixation: locking plate versus K-wire?. *Orthop Traumatol Surg Res*. 2010;96:506-512.
23. Leinberry C, Ukomadu U, Ilyas A. Metacarpal Fractures and Carpometacarpal Fracture-Dislocations. 2013, 1st New Delhi, India Jaypee Brothers Medical Publishers.
24. Botte MJ, Davis JLW, Rose BA, et al. Complications of smooth pin fixation of fractures and dislocations in the hand and wrist. *Clin Orthop Relat Res*. 1992:194-201.
25. Balaram AK, Bednar MS. Complications after the fractures of metacarpal and phalanges. *Hand Clin*. 2010;26:169-177.
26. Tobert DG, Klausmeyer M, Mudgal CS. Intramedullary fixation of metacarpal fractures using headless compression screws. *J Hand Microsurg*. 2016;8:134-139