

GEORGIAN MEDICAL NEWS

ISSN 1512-0112

NO 11 (344) ноябрь 2023

ТБИЛИСИ - NEW YORK



ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии
საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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

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

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

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

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. 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.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, ანათალებების 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.

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| Stepanyan Lusine, Papoyan Varduhi, Galstyan Alina, Sargsyan Diana. THE PROBLEM OF COMPETENCIES MODELING IN THE SOCIAL-PSYCHOLOGICAL CRISIS CONDITIONS..... | 6-12 |
| Biduchak A, Mararash H, Mohammad Wathek O Alsalama, Chornenka Zh, Yasinska E. ORGANIZATIONAL AND FUNCTIONAL MODEL OF IMPROVEMENT OF THE SYSTEM OF PREVENTION OF CONFLICT SITUATIONS IN THE FIELD OF HEALTHCARE..... | 13-18 |
| Shalabh Kumar, Sanjay Kumar Yadav, Komal Patel, Renuka Jyothi. R, Bhupendra Kumar, Vikram Patidar. EARLY IMPLANT OUTCOMES IN ADULTS WITH DENTAL DECAY TREATED WITH PHOTODYNAMIC TREATMENT..... | 19-26 |
| M. Zubiashvili, N. Kakauridze, P. Machavariani, T. Zubiashvili. THE SIGNIFICANCE OF CIRCULATING SURFACTANT PROTEIN D(SP-D) AND DYSLIPIDEMIA IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD), CORONARY HEART DISEASE (CHD) AND THEIR COMBINATION..... | 27-33 |
| Mohamed Hamdi Mohamed Elgawadi, Yasser Abdel Fattah Radwan, Sherif Abdel Latif Othman, Ahmed Samir Barakat, Ahmed Omar Sabry, Abdallu Mohamed Ahmed. RANDOMIZED COMPARATIVE STUDY OF DEFINITIVE EXTERNAL FIXATION VERSUS ORIF IN PILON FRACTURES: AN EARLY CLINICAL OUTCOME REPORT..... | 34-38 |
| Salome Glonti, Megi Inaishvili, Irina Nakashidze. EVALUATION OF SOME LABORATORY PARAMETERS IN PATIENTS WITH MORBID OBESITY AFTER BARIATRIC SURGERY..... | 39-42 |
| Balbeer Singh, Soubhagya Mishra, Rajnish Kumar, Devanshu J. Patel, Malathi.H, Bhupendra Kumar. IMPLICATION OF THREAT FACTORS AND PREEXISTING DISORDERS IN DIFFERENT ISCHEMIC STROKE SUBGROUPS IN ELDERLY PEOPLE: A SYSTEMATIC STUDY..... | 43-46 |
| Liubov Bilyk, Neonila Korylchuk, Dmytro Maltsev, Mykola Rudenko, Olena Kozeratska. TRANSFORMATION OF UKRAINIAN HEALTHCARE TO THE NEW CONDITIONS OF DEVELOPMENT: RISKS, SOLUTIONS, MODERNISATIONOPTIONS..... | 47-52 |
| Kozak N.P, Stakhova A.P. A CASE REPORT OF EOSINOPHILIC GRANULOMATOSIS WITH POLYANGIITIS..... | 53-56 |
| Amandeep Singh, Pravesh Kumar Sharma, Ashok Kumar Singh, Chhaya Agarwal, Geetika M. Patel, Kavina Ganapathy. RELEVANCE FOR DIAGNOSIS, THERAPY, AND STRATEGIES OF GUT MICROBES DYSBIOSIS IN CHRONIC KIDNEY DISEASE: A SYSTEMATICREVIEW..... | 57-63 |
| Sharadze D. Z, Abramov A. Yu, Konovalov O.E, Fomina A.V, Generalova Yu.A, Kakabadze E. M, Bokova E. A, Shegai A.V, Kozlova Z.V, Fokina S.A. MEDICAL AND SOCIAL ASPECTS OF PREVENTING SPORTS INJURIES AMONG CHILDREN AND ADOLESCENTS..... | 64-71 |
| Hisham A. Ahmed, Abdulhameed N. Aldabagh, Abdulsattar S. Mahmood. COMPARISON BETWEEN PRE- AND POST-OPERATIVELY BOTOX INJECTION IN SECONDARY WOUNDS HEALING..... | 72-76 |
| Pantus A.V, Rozhko M.M, Paliychuk I.V, Kutsyk R.V, Kovalchuk N.Y. EFFECTIVENESS OF THE APPLICATION OF THE DEVELOPED BIOPOLYMER FIBROUS MATRIX WITH CENOBONE® BIOGEL FOR THE RECONSTRUCTION OF BONE TISSUE DEFECTS OF THE JAWS..... | 77-84 |
| Sherif W. Mansour, Nesrin R. Mwafi, Nafe' M. AL-Tawarah, Bayan Masoud, Hamzah A. Abu-Tapanjeh, Ibraheem M. Alkhalwaldeh, Mohammad S. Qawaqzeh, Raghad Amro, Sulieman B. Mazahreh. PREVALENCE OF LEFT/RIGHT CONFUSION AMONG MEDICAL STUDENTS IN MUTAH UNIVERSITY- JORDAN..... | 85-89 |
| Sadhanandham S, Preetam K, Sriram V, B Vinod Kumar, Pulkit M, TR Muralidharan. SEVERITY OF MITRAL REGURGITATION AND ITS ASSOCIATION WITH LEFT VENTRICULAR DYSFUNCTION AND BRAIN- NATRIURETIC PEPTIDE LEVELS IN PATIENTS WITH ACUTE DECOMPENSATED HEART FAILURE..... | 90-93 |
| Ahmed J. Ibrahim, Niam Riyadh. EVALUATION OF MIDPALATAL SUTURE MATURATION IN THREE AGE GROUPS IN 10-25 YEARS USING CONE-BEAM COMPUTED TOMOGRAPHY..... | 94-100 |
| Mohammed J. Mohammed, Entedhar R. Sarhat, Mossa M. Marbut. HEPCIDIN AND IRON BIOMARKERS MODULATED IN HEMODIALYSIS PATIENTS..... | 101-105 |
| Hussein A. Ibrahim, Ammar L. Hussein. ESTIMATION OF VON WILLEBRAND FACTOR IN PATIENTS CARDIAC DISEASES..... | 106-110 |
| Mohammed L. Abdulateef, Nihad N. Hilal, Mohammed M. Abdul-Aziz. EVALUATION OF VITAMIN D SERUM LEVELS AND THYROID FUNCTION TEST IN HYPOTHYROIDISM IRAQI PATIENTS..... | 111-113 |

| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| Mohammed N. Mahmmod, Entedhar R. Sarhat. HEPCIDIN AND FERRITIN MODULATED IN OBESE MALE..... | 114-118 |
| Nato Gorgadze, Manana Giorgobiani, Jumber Ungiadze, Vera Baziari, Leila Axvlediani. EFFECTS OF MATERNAL BLOOD LEAD IN THE PRENATAL PERIOD ON NEWBORNS AND THE SPECIFICS OF THE CONDITION AT BIRTH..... | 119-123 |
| Harith S. Aziz, Ammar L. Hussein, Mohamed G. Zakari. MYELOPEROXIDASE AND COENZYME Q10 MODULATED IN THE CHRONIC KIDNEY DISEASE PATIENTS..... | 124-128 |
| Arnab Sain, Shilpi Awasthi, Oluwafunmilola UKOH (Adeyemi), Kanishka Wattage, Ahmed Elkilany, Adhish Avasthi. SAFE USE OF FLUOROSCOPY AND PERSONAL PROTECTION EQUIPMENT IN TRAUMA & ORTHOAEDICS..... | 129-132 |
| Azzam A. Ahmed. SUTURED VERSUS SUTURELESS CONJUNCTIVAL AUTOGRAFT FOR PRIMARY PTERYGIUM..... | 133-136 |
| Osmolian V, Avsievich Al, Parandiy Va, Okhman Ol, Loginova N. FORENSIC AND LEGAL SIGNIFICANCE OF HYPNOSIS DURING A CRIMINAL INVESTIGATION..... | 137-146 |
| Loqman J. Tawfiq, Ali K. Durib, Esraa S. Jameel. CONCENTRATION OF MALONDIALDEHYDE IN WIVES INFECTED WITH TOXOPLASMA GONDII WHICH CORRELATES WITH INTRAUTERINE INSEMINATION IN BAGHDAD'S POPULATION COUPLES..... | 147-151 |
| Georgi Tchernev, Naydekova N. MELANOMA AND DYSPLASTIC NEVI DEVELOPMENT AFTER RANITIDINE/RILMENIDINE/MOXONIDINE, LERCANIDIPINE, ROSUVASTATIN AND VERAPAMIL/TRANDOLAPRIL- NEW DATA/CASE SERIES. THE POTENTIAL ROLE OF NITROSAMINE/ NDSRIS CONTAMINATION IN POLYMEDICATION AS SUBSTANTIAL SKIN CANCER TRIGGERING FACTOR..... | 152-158 |
| Qutaiba A. Qasim. HEPARIN-INDUCED THROMBOCYTOPENIA (HIT) SYNDROME AMONG HEMODIALYSIS PATIENTS AND DISEASE MANAGEMENT STRATEGY..... | 159-170 |
| Oleg Batiuk, Iryna Hora, Valeriy Kolesnyk, Inna Popovich, Antonina Matsola. MEDICAL AND FORENSIC IDENTIFICATION OF PERSONS WHO HAVE BECOME VICTIMS OF WAR CRIMES OF THE RUSSIAN WAR AGAINST UKRAINE..... | 171-179 |
| F. Kh. Umarov, Ju.D. Urazbaev. PATIENT-RELATED FACTORS AFFECTING THE RISK OF COMPLICATIONS AFTER PRIMARY TOTAL HIP ARTHROPLASTY..... | 180-186 |
| Arnab Sain, Ahmed Elkilany, Arsany Metry, Marina Likos-Corbett, Emily Prendergast, Kanishka Wattage, Adhish Avasthi. OCCUPATIONAL HAZARDS IN ORTHOPAEDIC PROCEDURES-A NARRATIVE REVIEW OF CURRENT LITERATURE..... | 187-190 |
| Dhanya R.S, Pushpanjali K. IMPACT OF CULTURAL FACTORS ON THE DENTAL HEALTH STATUS AND BEHAVIOUR OF FEMALES IN THEIR GESTATION PERIOD..... | 191-195 |
| Georgi Tchernev. MULTIPLE KERATINOCYTIC CANCERS AFTER ENALAPRIL/LOSARTAN INTAKE: POTENTIAL LINKS TO DRUG MEDIATED NITROSOGENESIS/ CARCINOGENESIS: MELOLABIAL ADVANCED FLAP AND UNDERMINING SURGERY AS OPTIMAL THERAPEUTIC APPROACH..... | 196-199 |
| Subhrajee Chakraborty, Ankur Khandelwal, Rashmi Agarwalla, Limalemla Jamir, Himashree Bhattacharyya. ARTIFICIAL INTELLIGENCE: CREATING NEW PARADIGMS IN THE MANAGEMENT OF NON-COMMUNICABLE DISEASES..... | 200-202 |
| VILCAPOMA URETA LIZVE, AYALA GUEVARA KAREN JANET, JUNCHAYA YLLESCAS VILMA AMPARO, PARIJULCA FERNANDEZ ISRAEL ROBERT. COMPARISON OF THE EFFICACY OF TRAMADOL AND DICLOFENAC IN RELIEVING POSTOPERATIVE PAIN OF LAPAROSCOPIC CHOLECYSTECTOMY..... | 203-206 |

PATIENT-RELATED FACTORS AFFECTING THE RISK OF COMPLICATIONS AFTER PRIMARY TOTAL HIP ARTHROPLASTY

F. Kh. Umarov¹, Ju.D. Urazbaev².

¹State Institute «The Republican Specialized Scientific and Practical Medical Center of Traumatology and Orthopedics of the Ministry of Health of the Republic of Uzbekistan», Tashkent city, The Republic of Uzbekistan.

²State Institution "Republican Scientific Centre for Emergency Medical Care Khorezm Regional Branch" of the Ministry of Health of the Republic of Uzbekistan.

Abstract.

Total hip arthroplasty is considered an effective surgery to restore limb function, reduce pain, and improve patient quality of life. The number of primary THAs is increasing every year, but despite the success rates, revision surgery remains a serious complication. The purpose of this review is to summarize current scientific evidence and evaluate patient-related risk factors and their impact on the clinical and functional outcomes of primary THA and revision. Among the demographic factors that have a strong influence on the outcome of THA are age and body mass index. It has been shown that young people have a high risk of aseptic loosening and dislocation, and the risk of complications such as thromboembolism and infection is higher in the elderly and senile. The risk of revision and complications after primary THA is significantly increased in people with high body weight and obesity. A strong risk factor causing complications is smoking and alcohol abuse. The review analyzed the influence of various diseases present in patients as risk factors for various postoperative complications: osteoporosis, diabetes mellitus, rheumatoid arthritis, avascular necrosis, neurological diseases. An increased risk factor for dislocation and an important reason for surgical revision after primary THA is a history of orthopedic disease and spinal surgery (lumbar stenosis, scoliosis, spondylosis, discectomy, and trauma). Understanding patient-related factors is important for clinical decision making in primary THA and revision and contributes to understanding which patients will be at the highest risk of complications after surgery.

Key words. Total hip arthroplasty, complications, risk factors for complications, demographic, diseases.

Introduction.

Total hip arthroplasty (THA) results in rapid recovery of limb function after surgery. THA is used for osteoarthritis, femoral neck fracture – especially effective in displaced subcapital fractures (Garden types III or IV), intracapsular displaced fractures, avascular necrosis of the femoral head, hip dysplasia, ankylosing spondylitis, rheumatoid and traumatic arthritis [1-5]. Reconstruction of the hip joint by arthroplasty helps to eliminate clinical symptoms – relieves pain, restores motor function, which contributes to the improvement of the patient's quality of life. The number of THA is increasing every year due to the increase in the population of elderly and senile people with osteoporosis and osteoarthritis. Falls of a person with osteoporosis from a height of his height (low-energy fracture) or high-energy injuries (fall from height, motorway trauma, etc.) can lead to femoral neck fracture. Due to loss of limb function due to fracture or other conditions, mobility of the elderly is

impaired, care needs increase, and morbidity and mortality increase. Early mobilization of the patient group using THA helps in prevention of various complications.

Despite high success rates of primary THA, improvements in surgical technique and implant design, revision surgery continues to be a serious complication. The rate of revision THAs (RTHA) has increased by 25.6% from 2011–2015 to 2016–2020, but it is positive that the time between primary and RTHAs has increased from 8.8 ± 7.0 years to 10.2 ± 6.8 years [6]. The incidence of primary THAs is predicted to increase from 2014 to 2030 from 43% to 70%, with RTHAs increasing proportionately accordingly [7]. Based on an analysis of 219 revision surgeries, the leading causes within 5 years after primary THA were periprosthetic joint infection (29.6%), aseptic loosening (28.4%), and instability (22.2%). Five years after THA, late failures were aseptic loosening (75.4%), followed by periprosthetic fracture (8.0%) and polyethylene wear (5.8%) [8]. Implant-derived particulate debris causes an inflammatory reaction, bone resorption, and can lead to aseptic loosening, dislocation, and fracture [9,10].

Identifying risk factors, establishing their role, and validating the causes of failure after primary THA are important for developing new strategies to improve prosthetic longevity. Risk factors for THA instability are multifactorial. Patient-related factors (demographics, lifestyle, and diseases), preoperative, operative (implant selection, access, fixation method, surgical technique, etc.), and postoperative (rehabilitation measures, drug therapy, primarily aimed at reducing the risk of periprosthetic osteolysis) factors have an impact on the outcome of primary total hip arthroplasty and are being actively investigated [11-13].

This review aims to summarize the current scientific evidence and assess the risk patient-related factors, their impact on clinical and functional outcomes of primary THA and revision.

Methodology.

A search of the scientific literature was conducted in electronic databases including Scopus, Google, Google Scholar, PubMed and Embase using the following keywords: risk factors for complications after primary and revision hip arthroplasty, age, gender, body mass index, height, lifestyle, osteoporosis, diabetes mellitus, rheumatoid arthritis, aseptic necrosis, neurological diseases, orthopedic diseases, and spinal surgery.

Demographic factors.

Patient age and functional activity are considered as risk factors affecting complications of primary THA and revision [11,14]. After primary THA, a high risk of surgical site infection was observed in the age group of 76–80 years (adjusted odds ratio

(AOR) 1.21) compared to the control age group of 61–65 years. Age ≤ 50 years was associated with a significantly lower risk of surgical site infection (AOR 0.64) [15]. Compared to middle-aged patients, elderly patients have more risk factors (decreased immunity, nutritional deficiencies, diseases, age-related physiological and anatomical changes, etc.) that influence the predisposition to adverse effects of primary THA, including infections [15]. In a systematic review including 26 articles, 17 reported a statistically significant association between age and revision risk [11]. Fifteen sources identified an increased risk of revision for younger patients, noting that the risk of revision decreases after every 10 years. The increased risk of revision arthroplasty in the younger patient group may be related to high activity levels and increased joint loading. In another study in individuals aged 46 to 50 years, the risk of possible revision surgery was calculated to be 27.6%, and as age increased from 90 to 95 years, the probability of revision decreased to 1.1% [16]. High odds ratios of revision (OR 1.52) were found for patients younger than 75 years of age at the time of primary surgery [17]. It has also been shown that the risk of major complications such as deep vein thrombosis (DVT) and pulmonary embolism (PE) increases with age in primary THA and RTHA [18].

A risk factor affecting the outcome of THA is frailty and physical condition of the patient, which are assessed preoperatively using the 9-point The Clinical Frailty Scale (CFS) for adults over 65 years of age and the American Society of Anesthesiologists (ASA) classification based on five classes (ASA I–ASA V) to assess the physical condition of the patient. The authors observed favorable THA results and relatively low complication rates with CFS scores <5 [19], with high preoperative ASA scores being a negative factor.

Gender. The influence of gender on complications and implant failure is controversial, but most studies have considered male gender as a risk factor [11,19–21]. Based on the analysis of 18 articles, seven of them reported an increased risk of revision for males and only one study (6%) reported an increased risk of revision for females [11]. There is a study that quantified the estimated lifetime risk of revision (LTRR) after total THA in 63 158 patients. The authors found that in men in the 50–55 age group, the LTRR was 24%, which is about 1.7 times higher than in women [20]. There is evidence of an increased risk of periprosthetic infection in men, as reported after analyzing 623 253 primary THAs [22]. In general, when considering the effect of gender on primary THA outcomes, a limited number of studies should be noted. In addition, when considering the influence of gender on THA outcomes, it is necessary to consider other components, such as the patient's hormonal background, bone condition (osteopenia, osteoporosis), lifestyle, and other factors that require research.

Body mass index in the studies presented below, based on the classification proposed by the World Health Organization: underweight (BMI < 18.5 kg/m²), overweight (BMI 25–29.9 kg/m²), class I obesity (BMI 30–34.9 kg/m²), class II obesity (BMI 35–39.9 kg/m²) or class III obesity (BMI ≥ 40 kg/m²).

Currently, approximately 27% of primary THA in middle-aged women in the UK is obesity-related. When assessing the mean age of patients at the time of primary THA, it was found that

non-obese individuals (BMI < 30 kg/m²) are routinely operated on at 69.1 years of age, obese individuals (BMI between 30 kg/m² and < 40 kg/m²) earlier at a mean age of 65.5 years, and those with morbid obesity (BMI ≥ 40 kg/m²) significantly earlier at 60.6 years [23]. The risk of hip arthroplasty increases with increasing both BMI and weight gain for every 5 kg. A comparison of a group of women weighing 75 kg with women <60 kg showed that the relative risk of THA was 2.37 times higher in the former.

Total hip arthroplasty in obese patients requires more preoperative optimization, is technically more complex, and has a high risk of complications, including an increased risk of revision [17,24,25]. It was found that for obese men and women after primary THA, the chance of revision is significantly increased (OR 1.66) [17]. In another study, when comparing obese women (BMI 30 kg/m² or more) with women with low BMI < 22.5 kg/m², the relative chance of revision was significantly higher in obese women (OR 2.47) [23]. Comparing body mass index (BMI) ≥ 30 and <30 kg/m² revealed an increased chance for dislocation after primary THA (OR 1.38) [19]. Obese patients have also been shown to have approximately 4.7 times increased aseptic loosening and osteolysis, which increases the risk of early revision surgery [26]. Obesity is considered to be an independent risk factor for early aseptic loosening of the endoprosthesis stem [27]. The rates of deep vein thrombosis, pulmonary embolism after primary THA were studied in patients with an elevated body mass index (BMI). In one of the largest studies based on the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database from 2008 to 2016, evaluated 30-day rates of deep vein thrombosis, pulmonary embolism, and combined venous thrombosis after primary THA in obese patients compared with normal weight patients [18]. In this study, obesity was considered in conjunction with other patient risk factors such as age, sex, race, patients' ASA physical status scores, diseases (diabetes, hypertension, chronic obstructive pulmonary disease), smoking status, type of anesthesia and serum albumin levels. The analysis showed that overweight or obese patients had an increased risk of pulmonary embolism but not deep vein thrombosis after primary THA, but there was no difference in the sample of patients after RTHA compared with normal weight patients. The authors consider this finding to be the result of a small sample size. Obese patients may be at increased risk of postoperative THA due to low postoperative activity, and elevated proinflammatory markers. In patients with high BMI, a strong association was found between age, high preoperative patient physical status index (ASA), vein thrombosis and pulmonary embolism [18].

An analysis of other risk factors for venous thromboembolism after primary THA is also presented. The authors identified 3 major risk factors out of ten risk factors studied, including obesity (BMI ≥ 30), that were significantly associated with THA: a history of venous thrombosis (OR > 10.6), varicose veins (OR > 2.7), and congestive heart failure (OR > 2) [24]. There was also an 8% to 30% increased risk of venous thrombosis for female subjects (age ≥ 80 years) with hypertension and oncology with a predominance in blacks.

In this review, we do not analyze periprosthetic infection factors related to surgery and hospital infection, but overweight and obesity are also considered as increased risk factors for periprosthetic infection in patients after primary THA [21,28] with an RR of 2.40 [29]. Patients with BMI >30 had greater intraoperative blood loss than patients with BMI <30 [13].

Blood groups. Not only the BMI of the patient but also the blood group present in the patient can lead to intraoperative blood loss. A prospective study of women with blood groups A, B, AB, and O, similar in age, body weight, and time of surgery, who underwent primary total hip arthroplasty was conducted [30]. A greater volume of blood loss was found in patients with blood type O. The authors suggest that this may be due to low levels of von Willebrand factor, which is involved in stopping bleeding – it activates platelets and stabilizes clotting factor VIII. This factor is about 25% lower in people with blood group O than in people with blood groups A, B and AB [30].

Another study evaluated the association between ABO blood groups and the development of symptomatic venous thromboembolism in patients after primary total joint replacement. A multivariate regression model adjusted for risk factors including age, gender, BMI, smoking, type of surgery, previous venous thromboembolism, rheumatological diseases, malignancy, hypercoagulability status and venous thromboembolism prophylaxis was used [31]. It was found that the risk of symptomatic venous thromboembolism after total joint arthroplasty was statistically significantly increased in patients with blood type AB (OR 1.4). However, the risk of pulmonary embolism was increased in patients with this blood type only after total knee arthroplasty (OR 2.24), but not after THA (OR 0.742).

Patient height, in most studies, is considered as a risk factor for revision surgery after primary THA. A study analyzed 719 patients (case-control) who underwent RTHA after THA and showed a high chance of revision for men ≥ 170 cm and for women ≥ 159 cm (OR 1.40) [17]. A British study comparing a group of tall patients (170 cm and above) with patients of short stature (<155 cm) also found a higher risk of TNA in the taller (OR 1.90) [23].

Lifestyle.

Smoking is considered a negative risk factor not only preoperatively but also after THA and other surgical interventions. As shown in a meta-analysis based on 40 studies of primary THA and TKA involving 3,037,683 cases, smoking increased total complications (OR 1.41), wound healing (OR 1.77) and increased the odds ratio of joint infection (OR 1.84) [32]. In another study, after primary THA, smokers compared to non-smokers showed development of superficial or deep infection and infection requiring revision surgery, odds ratio OR 1.54 (95% CI: 1.25-1.91 [33]. In addition, patients who smoke usually have a higher risk of complications after THA: cardiac arrest (OR 4.90), cerebral circulatory failure (OR 2.22), pneumonia (OR 2.35), acute renal failure (OR 2.01), sepsis (OR 4.35), and in-hospital death (OR 12.37) [32]. Smoking patients undergoing THA had higher 1-year mortality rates compared to nonsmokers and ex-smokers [34].

An increased risk of complications was observed in patients who smoked cigarettes within 90 days of primary THA. Higher

rates of wound rupture, pneumonia, deep vein thrombosis, acute kidney injury, cardiac arrest, need for blood transfusion, re-hospitalisation and longer length of stay were found compared with a control group of non-smoking patients [35]. Smokers showed higher rates of endoprosthesis stem dislocation and overall joint-related complications at 2 years compared to the control group [35]. Another study found that smoking affects aseptic loosening of the endoprosthesis (OR 1.62) and leads to revision with high frequency (OR 2.12) [32]. This may be due to impaired metabolic and bone quality, low serum levels of osteogenic markers compared to non-smokers.

In addition, smoking has a toxic effect directly on bone cells (osteoblasts and their precursors), indirectly affects hormones, disrupts vitamin D metabolism, and leads to vasoconstriction, which impairs oxygenation and bone quality [36,37]. The combined effects of smoking and increased risk of infection contribute to early aseptic loosening of the joint, which increases the frequency of revision. In addition, smokers are more likely to be prescribed opioids (OR 1.64) for pain management after primary THA [32].

Alcohol. Alcohol abuse is considered an independent risk factor for complications after primary THA [38,39]. A study was conducted in which, after primary THA for osteoarthritis, complications were evaluated in three groups of patients: those diagnosed with alcoholism (identified by codes, ICD-9: 305.01 and 305.02), alcohol dependence (ICD-9: 303.91 and 303.92) and a comparison control group [39]. Patients in the groups were matched according to age, gender, and comorbidities. The duration of hospital stay was statistically significantly longer in the main group patients. At 90 days after THA, a high incidence of medical complications was found in the main group (45.94% vs. 12.25%, OR 2.89), including respiratory failure, impaired cerebral circulation, acute kidney injury, pneumonia, episodes of intestinal obstruction, urinary tract infection, and others. After 2 years, implantation-related complications amounted to 17.71% vs. 8.46% (OR 1.97), among which periprosthetic fractures, dislocations, revisions, and others, exceeded almost twice the rates of the control group [39].

Excessive alcohol consumption combined with smoking have been associated with a high incidence of periprosthetic joint infection [40].

Medical problems, Diseases.

Proximal femoral fractures, degenerative and inflammatory joint are most common in the elderly and elderly, often with a variety of somatic conditions.

In the acute postoperative period, factors determining the length of hospital stay after primary THA have been studied, evaluating potentially modifiable risk factors, which include opioid use, hypotension (relative risk (RR) 1.232), low hemoglobin (RR 3.265), high glucose (RR 1.887) and high creatinine (RR 2.874) [41]. Non-modifiable risk factors determining the length of hospital stay after THA included non-white race (RR 1.497), single marital status (RR 1.724), older age (RR 1.330) and increased Charlson comorbidity index (RR 1.411), which predicts 10-year survival in patients with multiple comorbidities. Obesity, coronary heart disease and pulmonary hypertension were identified as independent risk

factors for deep periprosthetic infection after primary THA. If osteoporosis, diabetes mellitus (DM), cardiovascular and other diseases were present preoperatively or comorbidity was present in most patients, after primary THA, the risk of complications was significantly higher.

Osteoporosis is the most common disease affecting bone quality in the elderly and seniors. Osteoporosis is divided into primary (postmenopausal, senile) or secondary osteoporosis, which is associated with a variety of endocrine and metabolic diseases, connective tissue, gastrointestinal and other chronic diseases, nutritional and lifestyle problems. Bone quality is important for the long-term success of osseointegration, as the bone-implant interface area must be able to withstand high physiological loads, and poor bone quality around the implant increases the risk of aseptic loosening and fracture. In patients with osteoporosis treated with primary THA after proximal femoral fracture or osteoarthritis, 3 major potential complications have been documented: intraoperative fracture, increased risk of periprosthetic fracture due to osteolysis with implant migration, or late aseptic loosening [12,42]. The fragility of osteoporotic bone leads to intraoperative fractures ranging from 0.3 % to 7.8 %, and this variability in prevalence may reflect the use of different endoprosthesis stems and insertion methods [43]. To reduce the risk of complications, the International Society for Clinical Densitometry (ISCD) recommends bone mineral density assessment during orthopedic surgery [44], on the basis of which a rational approach to THA can be selected.

Among the unmodifiable risk factors for fracture after THA, besides osteoporosis (Hazard ratio, HR 2.043) and osteoporotic bone resorption of the proximal femur (HR 1.627), older age (HR 1.026) and femoral neck fracture as primary disease (HR 4.536) are considered [45]. According to the National Osteoporosis Guideline Group (NOGG), 57% of patients with osteoporosis need treatment, but only 8% receive adequate treatment [46], which should be taken into account during the patient's rehabilitation period.

Diabetes mellitus is a common metabolic disease, with the number of patients increasing every year. While 425 million adults worldwide suffered from DM in 2017, this number is predicted to rise to 629 million in 2035 [46]. Diabetes mellitus is statistically significantly associated with an increased risk of proximal femur fractures (OR 2.07), with rates higher in type 1 DM (OR 5.76) than in type 2 DM (OR 1.34), as shown in a meta-analysis including 2,293 cases of proximal femur fractures among 6,995,272 participants [47]. The high risk of fracture has also been pointed out by other researchers [48]. The odds ratio between DM and the risk of proximal femur fracture was similar in men and women (OR 1.09). Type 2 DM has a negative impact on postoperative outcome, including hospital stay and the incidence of early re-hospitalisation after femoral neck fracture [49].

Similar to primary THA, after RTHA, the incidence of hospital postoperative complications was more common among patients with type 2 DM compared to patients without DM (19% vs. 15.64), statistically significantly increased risks of postoperative infection (4.51% vs. 2.94%), acute posthemorrhagic anemia

(7.21% vs. 5.62%), and urinary tract infection (1.13% vs. 0.72%) [50]. In addition, ASA score ≥ 3 and DM were identified as significant risk factors for periprosthetic infection [21]. The comorbidities, older and senile age, and obesity increased the risk of periprosthetic infection [51]. An analysis of fourteen retrospective case-control and prospective cohort studies showed no association with venous thromboembolism after THA in patients with DM [24].

Neurological disorders. In patients with neurological diseases (Parkinson's disease, multiple sclerosis, cerebral palsy, Charcot's disease, poliomyelitis, spondylotic neuropathy and other conditions: stroke, brain injury, spinal cord injury, brain tumors, etc.) and the presence of a disorder in the hip joint, after THA, the pain in the joint is reduced and the function of the limb is improved [52]. However, there is an increased risk of complications with an incidence of up to 10.6 %, which mainly include dislocation of the endoprosthesis, compared to patients with THA without disease. A high odds ratio of dislocation (OR 1.63) and (OR 1.96) has been found in Parkinson's disease and dementia, respectively [51]. Patients with Parkinson's disease are at increased risk of superficial wound infection and deep vein thrombosis, the length of hospital stay is increased [53], and the risk of periprosthetic infection is almost 2-fold [54].

In cerebral palsy, the most frequent complication was hip dislocation, followed by periprosthetic femoral fracture, which occurred intraoperatively or within 6 months after THA. Other complications were periprosthetic joint infections, aseptic loosening, deep vein thrombosis, heterotopic ossification, and wound dissection [55]. The increased risk of complications after THA should be taken into account when planning surgery in patients with neurological disorders and discuss possible risks with the caregivers [52].

Chronic lung disease has been considered as a risk factor with a 1.2-fold increase dislocation after THA [29,51]. In addition, ASA score ≥ 3 and pulmonary disease have been identified as significant risk factors for periprosthetic infection after primary THA [21].

Rheumatoid arthritis. Patients with rheumatoid arthritis had longer hospital stays after THA; in addition, the risk of periprosthetic joint infection was increased 1.37-fold [29]. In addition to infection, high incidence of complications such as aseptic loosening, dislocation, periprosthetic fracture and mortality. Patients who received biological therapy before surgery have an increased risk of infection (HR 1.35) and venous thromboembolism (HR 4.82) compared to patients who did not receive biological drugs, which should be taken into account when planning THA [56]. Analysis of results THA identified both non-modifiable risk factors (type of surgery, gender) and modifiable risk factors (postoperative blood transfusion) that contribute to better management of anemia [52].

Orthopedic diseases and a history of spinal surgery (lumbar stenosis, scoliosis, spondylosis, discectomy, and trauma) are an increased risk factor for dislocation after primary THA with a high odds ratio (OR 1.89) and are an important reason for surgical revision [57]. A history of spondylosis is considered a strong independent predictor of dislocation after primary THA

(OR 2.45) [51], with long spondyloses increasing the risk of aseptic loosening (OR 2.33), dislocation (OR 3.25) infection (OR 2.14) and revision (OR 5.25), compared to controls [58].

Avascular necrosis. THA is used to treat late stages of avascular necrosis in 5-12% of cases. It has been found that the rate of medical complications in patients with avascular necrosis is higher compared to the control group (20.3% vs. 15.3%), they are more likely to undergo blood transfusion (19.6% vs. 13.9%), and they are twice as likely to be re-hospitalized (OR 2.093) [59]. The risk of endoprosthesis dislocation is also 1.6-fold higher [29].

Depression is a risk factor for complications after primary THA. In a study of the impact of first-time depression after primary THA, infection of the operated joint (OR 1.82), periprosthetic fracture (OR 1.72), and late hospital discharge (OR 1.59) were found [60]. The odds ratio of revision is elevated (OR 1.47). Another study also reported the effect of depression on increasing the risk of periprosthetic infection [22] and the risk of stem dislocation (OR 1.28) [51].

Conclusion.

Identifying risk factors as causes of THA failure is important and is the main link for developing new strategies to improve the endoprosthesis longevity. Understanding patient-related risk factors for THA and revision is important for clinical decision making to reduce the risk of complications. Although many studies have been conducted on patient demographic and medical risk factors, to date, there is no clear understanding of the role of individual factors in primary THA impairment and revision risk. Of the demographic factors, the greatest percentage of evidence is present for obesity. Obese patients have been shown to have an increased risk of operative and postoperative complications after primary THA and revision compared to patients with normal BMI. These complications are dominated by loosening, osteolysis, fractures, infection, and thrombosis. Complications associated with the risk of periprosthetic infection increase with age. The patient's blood group should also be considered in terms of risk stratification and prevention of bleeding and thromboembolism. In the preoperative period, special attention in planning surgery should be paid to patients who smoke and abuse alcohol, who have been shown to be at increased risk of developing multiple postoperative complications and revision after primary THA. The impact of osteoporosis on the outcome of THA may be related to a decrease in bone mineral density leading to bone fragility, alteration of the course of regeneration and periprosthetic fractures, the presence of diseases and other factors that require basic research. Risk factors for THA complications include diabetes mellitus, rheumatoid arthritis, avascular necrosis, neurologic diseases, etc. The contribution of orthopedic diseases and a history of spinal surgery to the development of complications after THA was evaluated.

The most common causes of THA complications that increase the risk of revision are loosening, dislocation, fractures, infection, etc., but the incidence and manifestation of complications vary according to patient demographics and medical data. Understanding risk factors, identifying groups of patients with specific characteristics that contribute to THA outcome, along with consideration of preoperative and operative

factors, is important for clinical decision making during surgical treatment and rehabilitation.

Conflict of interest.

The authors declare no conflict of interest and no financial interest in the preparation of the article.

Information about funding.

The article was written as part of the planned scientific work.

Authors' contribution: F. Umarov – conception and design of the study, analysis of the material and writing the article; J. Urazbaev – collection of literature sources, analysis, participation in writing the article.

REFERENCES

1. Cha Y.H, Yoo J.I, Kim J.T, et al. Dual mobility total hip arthroplasty in the treatment of femoral neck fractures: systematic review and meta-analysis. *Bone Joint J.* 2020;102-B:1457-1466.
2. You D, Sepehri A, Kooner S, et al. Outcomes of total hip arthroplasty using dual mobility components in patients with a femoral neck fracture: a systematic review and meta-analysis. *Bone Joint J.* 2020;102-B:811-21.
3. Gausden E.B, Cross W.W. 3rd, Mabry T.M, et al. Total Hip Arthroplasty for Femoral Neck Fracture: What Are the Contemporary Reasons for Failure? *J Arthroplasty.* 2021;36:S272-S276.
4. López P.D, Almada A.G, Iglesias S.L, et al. Instability Risk Factors in Total Hip Arthroplasty for Femoral Neck Fracture. *Rev Asoc Argent Ortop Traumatol.* 2022;87:685-692.
5. Sun W, Zhao K, Wang Y, et al. Epidemiological Characteristics and Trends of Primary Hip Arthroplasty in Five Tertiary Hospitals: A Multicenter Retrospective Study. *Orthop Surg.* 2023;15:2267-2273.
6. Feng X, Gu J, Zhou Y. Primary total hip arthroplasty failure: aseptic loosening remains the most common cause of revision. *Am J Transl Res.* 2022;14:7080-7089.
7. Schwartz A.M, Farley K.X, Guild G.N, et al. Projections and Epidemiology of Revision Hip and Knee Arthroplasty in the United States to 2030. *J Arthroplasty.* 2020;35:S79-S85.
8. Iamthanaporn K, Chareancholvanich K, Pornrattanamaneewong C. Revision primary total hip replacement: causes and risk factors. *J Med Assoc Thai.* 2015;98:93-99.
9. 15th Annual Report 2018. National Joint Registry for England, Wales, Northern Ireland, and the Isle of Man.
10. Xing D, Li R, Li J.J, et al. Catastrophic Periprosthetic Osteolysis in Total Hip Arthroplasty at 20 Years: A Case Report and Literature Review. *Orthop Surg.* 2022;14:1918-1926.
11. Prokopetz J.J, Losina E, Bliss R.L, et al. Risk factors for revision of primary total hip arthroplasty: a systematic review. *BMC Musculoskelet Disord.* 2012;13:251.
12. Bottai V, Dell'Osso G, Celli F, et al. Total hip replacement in osteoarthritis: the role of bone metabolism and its complications. *Clin Cases Miner Bone Metab.* 2015;12:247-50.
13. Hijazi A, Padela M.T, Sayeed Z, et al. Review article: Patient characteristics that act as risk factors for intraoperative complications in hip, knee, and shoulder arthroplasties. *J Orthop.* 2019;17:193-197.

14. Jo S, Lee S.H, Yoon S.J. Clinical Outcomes of Total Hip Arthroplasty for Displaced Femoral Neck Fractures in Patients 80 Years of Age and Older Selected by Clinical Frailty Score. *Hip Pelvis*. 2020;32:148-155.
15. Bischoff P, Kramer T.S, Schröder C, et al. Age as a risk factor for surgical site infections: German surveillance data on total hip replacement and total knee replacement procedures 2009 to 2018. *Euro Surveill*. 2023;28:2200535.
16. Nugent M, Young S.W, Frampton C.M, et al. The lifetime risk of revision following total hip arthroplasty. *Bone Joint J*. 2021;103-B:479-485.
17. Wright E.A, Katz J.N, Baron J.A, et al. Risk factors for revision of primary total hip replacement: results from a national case-control study. *Arthritis Care Res (Hoboken)*. 2012;64:1879-85.
18. Sloan M, Sheth N, Lee G.C. Is Obesity Associated With Increased Risk of Deep Vein Thrombosis or Pulmonary Embolism After Hip and Knee Arthroplasty? A Large Database Study. *Clin Orthop Relat Res*. 2019;477:523-532.
19. Kunutsor S.K, Barrett M.C, Beswick A.D, et al. Risk factors for dislocation after primary total hip replacement: meta-analysis of 125 studies involving approximately five million hip replacements. *Lancet Rheumatol*. 2019;1:e111-e121.
20. Bayliss L.E, Culliford D, Monk A.P, et al. The effect of patient age at intervention on risk of implant revision after total replacement of the hip or knee: a population-based cohort study. *Lancet*. 2017;389:1424-1430.
21. Zhong J, Wang B, Chen Y, et al. Relationship between body mass index and the risk of periprosthetic joint infection after primary total hip arthroplasty and total knee arthroplasty. *Ann Transl Med*. 2020;8:464-476.
22. Lenguerrand E, Whitehouse M.R, Beswick A.D, et al. Risk factors associated with revision for prosthetic joint infection after hip replacement: a prospective observational cohort study. *Lancet Infect Dis*. 2018;18:1004-1014.
23. Liu B, Balkwill A, Banks E, et al. Relationship of height, weight and body mass index to the risk of hip and knee replacements in middle-aged women. *Rheumatology (Oxford)*. 2007;46:861-7.
24. Zhang J, Chen Z, Zheng J, et al. Risk factors for venous thromboembolism after total hip and total knee arthroplasty: a meta-analysis. *Arch Orthop Trauma Surg*. 2015;135:759-72.
25. Rhind J.H, Baker C, Roberts P.J. Total Hip Arthroplasty in the Obese Patient: Tips and Tricks and Review of the Literature. *Indian J Orthop*. 2020;54:776-783.
26. Electricwala A.J, Narkbunnam R, Huddleston J.I. 3rd, et al. Obesity is Associated With Early Total Hip Revision for Aseptic Loosening. *J Arthroplasty*. 2016;31:217-220.
27. Goodnough L.H, Finlay A.K, Huddleston J.I. 3rd, et al. Obesity Is Independently Associated With Early Aseptic Loosening in Primary Total Hip Arthroplasty. *J Arthroplasty*. 2018;33:882-886.
28. Cochrane N, Ryan S, Kim B, et al. Total Hip Arthroplasty in Morbidly Obese: Does a Strict Body Mass Index Cutoff Yield Meaningful Change? *Hip Pelvis*. 2022;34:161-171.
29. Ren X, Ling L, Qi L, et al. Patients' risk factors for periprosthetic joint infection in primary total hip arthroplasty: a meta-analysis of 40 studies. *BMC Musculoskelet Disord*. 2021;22:776.
30. Maezawa K, Nozawa M, Gomi M, et al. Association of ABO blood group with postoperative total bleeding volume in patients undergoing total hip arthroplasty. *Vox Sang*. 2021;116:841-845.
31. Newman J.M, Abola M.V, Macpherson A, et al. ABO Blood Group Is a Predictor for the Development of Venous Thromboembolism After Total Joint Arthroplasty. *J Arthroplasty*. 2017;32:S254-S258.
32. Yue C, Cui G, Ma M, et al. Associations between smoking and clinical outcomes after total hip and knee arthroplasty: A systematic review and meta-analysis. *Front Surg*. 2022;9:970537.
33. Bojan B, Perni S, Prokopovich P. Systematic Review and Meta-Analysis of Tobacco Use as a Risk Factor for Prosthetic Joint Infection After Total Hip Replacement. *Arthroplast Today*. 2020;6:959-971.
34. Matharu G.S, Mouchti S, Twigg S, et al. The effect of smoking on outcomes following primary total hip and knee arthroplasty: a population-based cohort study of 117,024 patients. *Acta Orthop*. 2019;90:559-567.
35. Waters T.L, Collins L.K, Cole M.W, et al. Smokeless Tobacco Use is Associated With Worse Medical and Surgical Outcomes Following Total Hip Arthroplasty. *J Arthroplasty*. 2023;S0883-5403(23)00565-X.
36. Ehnert S, Aspera-Werz R.H, Ihle C, et al. Smoking Dependent Alterations in Bone Formation and Inflammation Represent Major Risk Factors for Complications Following Total Joint Arthroplasty. *J Clin Med*. 2019;8:406.
37. Barbosa A.P, Lourenço J.D, Junqueira J.J.M, et al. The deleterious effects of smoking in bone mineralization and fibrillar matrix composition. *Life Sci*. 2020;241:117132.
38. Karlson E.W, Ratzlaff C, Lu B, et al. Alcohol Consumption and Risk of Total Hip Replacement Due to Hip Osteoarthritis in Women. *Arthritis Rheumatol*. 2023;75:1522-1531.
39. Horn A.R, Diamond K.B, Ng M.K, et al. The Association of Alcohol Use Disorder with Perioperative Complications following Primary Total Hip Arthroplasty. *Hip Pelvis*. 2021;33:231-238.
40. Challoumas D, Munn D, Stockdale H, et al. Outcomes of total hip and knee arthroplasty in special populations: a synopsis and critical appraisal of systematic reviews. *Arthroplasty*. 2023;5:34.
41. Farley K.X, Anastasio A.T, Premkumar A, et al. The Influence of Modifiable, Postoperative Patient Variables on the Length of Stay After Total Hip Arthroplasty. *J Arthroplasty*. 2019;34:901-906.
42. Karachalios T.S, Koutalos A.A, Komnos G.A. Total hip arthroplasty in patients with osteoporosis. *Hip Int*. 2020;30:370-379.
43. Davidson D, Pike J, Garbuz D, et al. Intraoperative periprosthetic fractures during total hip arthroplasty. Evaluation and management. *J Bone Joint Surg Am*. 2008;90:2000-12.
44. Ding X, Liu B, Huo J, et al. Risk factors affecting the incidence of postoperative periprosthetic femoral fracture in primary hip arthroplasty patients: a retrospective study. *Am J Transl Res*. 2023;15:1374-1385.

45. Holzer L.A, Borotschnig L, Holzer G. Evaluation of FRAX in patients with periprosthetic fractures following primary total hip and knee arthroplasty. *Sci Rep.* 2023;13:7145.
46. Guariguata L, Whiting D.R, Hambleton I, et al. Global estimates of diabetes prevalence for 2013 and projections for 2035. *Diabetes Res Clin Pract.* 2014;103:137-149.
47. Fan Y, Wei F, Lang Y, et al. Diabetes mellitus and risk of hip fractures: a meta-analysis. *Osteoporos Int.* 2016;27:219-228.
48. Bai J, Gao Q, Wang C, et al. Diabetes mellitus and risk of low-energy fracture: a meta-analysis. *Aging Clin Exp Res.* 2020;32:2173-2186.
49. Lee T.C, Lee Y.L, Chen J.C, et al. Impact of type 2 diabetes on postoperative outcome after hip fracture: nationwide population based study in Taiwan. *BMJ Open Diab Res Care.* 2020;8:e000843.
50. López-de-Andrés A, Hernández-Barrera V, Martínez-Huedo M.A, et al. Type 2 diabetes and in-hospital complications after revision of total hip and knee arthroplasty. *PLOS One.* 2017;12:e0183796.
51. Gausden E.B, Parhar H.S, Popper J.E, et al. Risk Factors for Early Dislocation Following Primary Elective Total Hip Arthroplasty. *J Arthroplasty.* 2018;33:1567-1571.e2.
52. O'Driscoll C.S, Hughes A.J, Davey M.S, et al. Total Hip Arthroplasty in Patients With Neurological Conditions: A Systematic Review. *Arthroplast Today.* 2022;19:101068.
53. Kleiner J.E, Eltorai A.E.M, Rubin L.E, et al. Matched cohort analysis of total hip arthroplasty in patients with and without Parkinson's disease: complications, mortality, length of stay, and hospital charges. *J Arthroplasty.* 2019;34:S228-S231.
54. Shah N.V, Solow M, Lavian J.D, et al. Total hip arthroplasty in Parkinson's disease patients: a propensity score-matched analysis with minimum 2-year surveillance. *Hip Int.* 2020;30:684-689.
55. Adams C.T, Lakra A. Clinical and functional outcomes of total hip arthroplasty in patients with cerebral palsy: A systematic review. *J Orthop.* 2020;21:19-24.
56. Cordtz R, Odgaard A, Kristensen L.E, et al. Risk of medical complications following total hip or knee arthroplasty in patients with rheumatoid arthritis: A register-based cohort study from Denmark. *Semin Arthritis Rheum.* 2020;50:30-35.
57. Fessy MH, Putman S, Viste A, et al. What are the risk factors for dislocation in primary total hip arthroplasty? A multicenter case-control study of 128 unstable and 438 stable hips. *Orthop Traumatol Surg Res.* 2017;103:663-668.
58. Tsai S.H.L, Lau N.C, Chen W.C, et al. Total hip arthroplasty has higher complication rates in stiff spine patients: a systematic review and network meta-analysis. *J Orthop Surg Res.* 2022;17:353.
59. Lovecchio F.C, Manalo J.P, Demzik A, et al. Avascular Necrosis Is Associated With Increased Transfusions and Readmission Following Primary Total Hip Arthroplasty. *Orthopedics.* 2017;40:171-176.
60. Wilson J.M, Schwartz A.M, Farley K.X, et al. Preoperative Patient Factors and Postoperative Complications as Risk Factors for New-Onset Depression Following Total Hip Arthroplasty. *The Journal of arthroplasty.* 2021;36:1120-1125.

Пациент-связанные факторы, влияющие на риск осложнений после первичной тотальной артропластики тазобедренного сустава

Ф.Х. Умаров, Ж.Д. Уразбаев

¹Государственное учреждение "Республиканский специализированный научно-практический медицинский центр травматологии и ортопедии Министерства здравоохранения Республики Узбекистан", г. Ташкент, Республика Узбекистан.

²Государственное учреждение «Республиканский научный центр экстренной медицинской помощи Хорезмский областной филиал Министерства здравоохранения Республики Узбекистан», г. Ургенч, Узбекистан.

Резюме

Тотальное эндопротезирование тазобедренного сустава относят к эффективной операции для восстановления функции конечности, снижения боли и повышению качества жизни пациента. Количество первичных ТНА увеличивается с каждым годом, но, несмотря на показатели успеха, ревизионные операции продолжают оставаться серьезным осложнением. Цель обзора – обобщить текущие научные данные и оценить пациент-связанные факторы риска, их влияние на клинические и функциональные результаты первичной ТНА и ревизии. Среди демографических факторов, оказывающих сильное влияние на исход ТНА, являются возраст и индекс массы тела. Показано, что высокий риск асептического расшатывания эндопротеза и вывиха имеют лица молодого возраста, а риск таких осложнений, как тромбоз, инфекции – пожилого и старческого возраста. Значительно повышен риск ревизии и осложнений после ТНА у лиц с высокой массой тела и ожирением. Сильным фактором риска, вызывающим осложнения, являются курение и злоупотребление алкоголем. В обзоре проанализировано влияние различных заболеваний, присутствующих у пациентов как факторов риска различных послеоперационных осложнений: остеопороза, сахарного диабета, ревматоидного артрита, аваскулярного некроза, неврологических заболеваний. Оценен вклад ортопедических заболеваний и операций на позвоночнике в анамнезе на риск развития осложнений после ТНА. Понимание пациент-связанных факторов риска, имеет важное значение для принятия клинических решений при проведении первичной ТНА и ревизии, а также способствует пониманию, какие пациенты после хирургии будут подвергаться наибольшему риску осложнений.

Ключевые слова: эндопротезирование тазобедренного сустава, факторы риска осложнения, демографические, заболевания.