GEORGIAN MEDICAL NEWS

ISSN 1512-0112

NO 7-8 (364-365) Июль-Август 2025

ТБИЛИСИ - NEW YORK

ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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

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

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

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

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

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

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

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

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

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

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

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

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

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

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

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

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

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

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

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

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

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

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

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

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

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

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

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

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

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

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

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

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

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

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

GEORGIAN MEDICAL NEWS
NO 7-8 (364-365) 2025

Содержание:

Babry I. Oren, Marina I. Devdariani, Gela V. Beselia, Nino N. Sikharulidze, Manana G. Dashniani, Maia A. Burjanadze, Ia R. Kvachakidze, Marina I. Nebieridze, Lena Sh. Davlianidze, Lali M. Gumberidze, Nodar P. Mitagvaria.
ROLE OF ANTIOXIDANT FOLIUM EXPOSURE ON OXIDATIVE SRESS IN A VALPROIC ACID-INDUCED ANIMAL MODEL OF AUTISM……...6-15

Hajdi Gorica, Pavllo Djamandi, Gentian Vyshka.
DELAYED ONSET OF MYASTHENIA GRAVIS FOLLOWING COLECTOMY FOR ULCERATIVE COLITIS: A CASE STUDY……..16-17

Zhadyra Yersariyeva, Bagdad Suleyeva, Botagoz Turdaliyeva, Yeldos Tussipbayev.
HEMOSTASIS GENE POLYMORPHISM IN RETINAL VASCULAR OCCLUSION: A SYSTEMATIC REVIEW……..……..…18-28

Ilia Nakashidze, Nameera Parveen Shaikh, Shota Nakashidze, Aleena Parveen Shaikh, Sarfraz Ahmad, Irina Nakashidze.
EVALUATION OF TNF-A LEVELS IN MALE PATIENTS WITH STROKE: PROGNOSTIC IMPLICATIONS…….....…….29-32

Yerbolat Iztleuov, Marat Iztleuov, Altynbek Dushmanov, Gulmira Iztleuova.
PREVENTION IN THE PARENTAL GENERATION OF EXPOSED RATS: CONSEQUENCES OF TOXIC EXPOSURE TO CHROMIUM AND GAMMA IRRADIATION IN AN EXPERIMENTAL MODEL…….....……..33-45

Rashid Nassar, Nadine Khayyat, Michele Halasa, Fahad Hussain.
TRAUMATIC ANTERIOR SHOULDER INSTABILITY (TUBS): A NARRATIVE REVIEW OF CURRENT LITERATURE……..…46-50

Albadawi Abdelbagi Talha, Mawaheip A. Abdo Jeweser, Abubakr Ali Elamin Mohamed Ahmed, Abdelrahman Eldaw Mohammed, Elhadi Abdalla Ahmed, GadAllah Modawe, Sanaa Elfatih Hussein.
THE HBV AND HCV SEROPREVALENCE AMONG BLOOD DONORS IN Al-DAMAZIN STATE, SUDAN: A THREE-YEAR RETROSPECTIVESTUDY…….....……..…51-54

Hiba Salah Hasan, Teeb Ali, Kadhim Adnan Ali, Al hassan Ali, Hany A. Al-hussaniy.
MODELING DRUG–ORGAN INTERACTIONS AND OPTIMIZING IMMUNOTHERAPY: A QUANTITATIVE SYSTEMS PHARMACOLOGY AND ODRONEXTAMAB DYNAMICS…….....……..…55-60

Zilola Mavlyanova, Davron Ravshanov, Malika Ibragimova, Lola Irbutaeva, Khalimova Fariza, May K. Ismail, Shawgi A. Elsiddig, Marwan Ismail, Salma E R Mohamed, Sara Mohammed Ali.
PROGNOSTIC SIGNIFICANCE OF PROLIFERATION (KI-67) AND ANGIOGENESIS (CD34) MARKERS IN MENINGIOMAS FOR THE DEVELOPMENT OF REHABILITATION STRATEGIES…….....……61-65

A.R. Abzaliyeva, K.K. Kurakbayev, A.R. Ryskulova, Z.R. Abzaliyev, E. Tasmagambet, D.Zh. Saussanova.
TURNOVER INTENTIONS AMONG PHYSICIANS AND NURSES IN KAZAKHSTAN DURING THE COVID-19 PANDEMIC: A CROSS-SECTIONAL STUDY OF PSYCHOLOGICAL AND PROFESSIONAL CHALLENGES…….....…….66-72

A.A. Mammadov, A.N. Mustafayev, A.H. Aliyev.
RADIOLOGICAL IMAGING METHODS FOR ACCURATE DIAGNOSIS OF ABDOMINAL POSTOPERATIVE COMPLICATIONS…73-76

I.A. Lebedev, E.V. Zakharchuk, Yu.V. Boldyreva, I.A. Aptekar, E.I. Malinina.
OSSIFICATION OF THE POSTERIOR LONGITUDINAL LIGAMENT: A CASE REPORT AND LITERATURE REVIEW……..…….77-79

Zhanar Balmukhamedova, Gulmira Derbissalina, Aliya Dzholdasbekova, Dariga Blyalova, Luiza Murzakhalova.
SPECKLE-TRACKING ECHOCARDIOGRAPHY FOR EARLY DETECTION OF SUBCLINICAL SYSTOLIC DYSFUNCTION IN PERIMENOPAUSAL WOMEN WITHOUT APPARENT DIASTOLIC DYSFUNCTION…….....……80-86

Arkam Thabit Al Neama, Musab Mohammed Khalaf, Ahmed A.J. Mahmood.
PATTERNS OF ACETYLCHOLINESTERASE AND BUTYRYLCHOLINESTERASE ACTIVITY IN COMMON CARDIOVASCULAR PHENOTYPES…….....……87-94

Argjira Veseli, Shefqet Mrasori, Ivana Čuković-Bagić, Lul Raka, Kaltrina Veseli, Enis Veseli.
PARENTAL QUALITY OF LIFE WHEN RAISING CHILDREN WITH AUTISM SPECTRUM DISORDER: A NARRATIVE REVIEW…….....……...95-100

Anas Ali Alhur, Daliya T. Sendi, Miad M. AlZahrani, Layla T. Abusharha, Rahaf Y. Abudaak, Rahmah Alsinan, Rama R. Alharbi, Lamia Almadhi, Laila M. Alotaibi, Mona A. Hadadi, Shaima H. Alattas, Fatimah Almisbah, Fathi Almisbah, Abdulrahman Alrashed, Kawkab Alharbi.
EVALUATING THE TRUSTWORTHINESS OF CHATGPT-GENERATED HEALTH INFORMATION AMONG FUTURE HEALTH CARE PROFESSIONALS…….....……...101-106

Ting-Ting Wang, Yan Wang.
HUMANISTIC CARE NURSING FOR PATIENTS IN THE OPERATING ROOM DURING THE PERIOPERATIVE PERIOD: FULL-CYCLE CARE FROM PHYSIOLOGY TO PSYCHOLOGY…….....……107-109

Zauresh Barmanasheva, Mariya Laktionova, Anna Onglas, AyauIym Kossetova, Ivan Melnikov.
PREVALENCE AND RISK FACTORS OF UTERINE FIBROIDS IN WOMEN OF REPRODUCTIVE AGE: A FACILITY-BASED STUDY IN A MEGACITY…….....……110-120

Bolat Ashirov, Assel Kassymova, Jamilya Mansurova, Andrey Orekhov, Meiramgul Tokbulatova, Mirgul Kapakova, Zhanar Toktarova, Aisulu Zhunuspekova.
PROGNOSTIC MARKERS OF ISCHEMIC AND HEMORRHAGIC COMPLICATIONS IN PATIENTS WITH ATRIAL FIBRILLATION AFTER PERCUTANEOUS CORONARY INTERVENTION…….....……121-128

Khalilov Sh. Dzh.
ELECTROCARDIOGRAPHY CHARACTERISTICS OF THE PATIENTS WITH NON-ST-ELEVATION MYOCARDIAL INFARCTION (NS TEMI)……129-132

Salome Kordzaia, Elene Dolmazashvili, Khatuna Tsiklauri, Lasha Khmaladze, Nana Chikhladze.
FROM INFUSION REACTION TO IMMUNE CASCADE: A CASE OF SEQUENTIAL TAXANE AND CAPECITABINE TOXICITIES IN TRIPLE-NEGATIVE BREAST CANCER……133-136

Yu Zhu, Fandong Zeng, Weiwei Chang, Liying Wen, Lijun Zhu, Yuelong Jin.
AN EMPIRICAL STUDY ON THE ASSOCIATION BETWEEN ASPIRATION INDEX AND ACADEMIC PERFORMANCE AMONG PREVENTIVE MEDICINE STUDENTS……..137-142

Alaa O Ahmed, Mubarak S Karsany, Mohamed Elfatih Abdelwadoud, Mutaz Ali, Osama Mohamed, Amged Gaffer Mostafa, Hussam Ali Osman, Elryah I Ali, Elyasa Elfaki, Tagwa Yousif Elsayed Yousif, Ayman H. Alfeel, Mohammed Ibrahim Saeed.
MOLECULAR DETECTION OF HIGH RISK HUMAN PAPILLOMA VIRUS SUBTYPES IN CERVICAL SMEARS AMONG SUDANESE WOMEN……143-149

Tchernev G, Tchernev KG Jr, Krastev DS, Krastev NS, Kordeva S.
DERMATOLOGIC SURGERY ROUNDS: RECONSTRUCTIVE SURGERY EMPLOYING THE SHARK ISLAND FLAP FOR BASAL CELL CARCINOMA AFFECTING THE NASAL ALA……150-153

Saltanat Imanalieva, Bayan Sagindykova, Rabiga Anarbayeva, Murat Omirali, Gulnara Ospanova, Murat Ashirov.
CURRENT STATUS AND PROSPECTS FOR THE DEVELOPMENT OF PEDIATRIC DOSAGE FORMS BY THE EXAMPLE OF COMBINED MELOXICAM AND VITAMIN B12 TABLETS……154-167

Ahmed Miri Saadoon.
INCIDENCE OF PRESSURE SORE IN THE INTENSIVE CARE UNIT AT AL-DIWANYIA TEACHING HOSPITAL……168-171

Isoyan A.S, Danielyan M.H, Antonyan I.V, Azizyan N.H, Mkrtchyan A.A, Karapetyan K.V, Nebogova K.A.
MORPHOHISTOCHEMICAL ANALYSIS OF CORTICAL STRUCTURES IN AN EXPERIMENTAL MODEL OF PROLONGED COMPRESSION SYNDROME OF THE HIND LIMB IN RATS……172-179

Abdulaziz Alroshodi, Faisal A. Al-Harbi, Rasil Sulaiman Alayed, Fahad M. Alharbi, Khalid A Alkhalifah, Mayadah Assaf Alawaji, Ibrahim S. Alsabhawi.
FACTORS IMPACTING HEMODIALYSIS TREATMENT ADHERENCE IN END-STAGE RENAL DISEASE PATIENTS RECEIVING IN-CENTER HEMODIALYSIS IN QASSIM REGION……180-187

Gulshat Alimkhanova, Marat Syzdykbayev, Rinat Ashzhanov, Kulsara Rustemova, Maksut Kazymov, Rustem Kazangapov, Asem Kazangapova, Saule Imangazinova, Yernar Kairkhanov, Bazar Tuleuov, Sanzhar Khalelov, Roman Khripunov, Samatbek Abdrakhmanov, Abay Mijatov.
THE TRANSVERSUS ABDOMINIS PLANE BLOCK AS A METHOD OF MULTIMODAL OPIOID-SPARING POSTOPERATIVE ANALGESIA: A NARRATIVE REVIEW……188-194

Zhengmei Fang, Xiaoling Ran, Lijun Zhu, Yingshui Yao, Yuelong Jin.
THE IMPACT OF BMAL1 GENE POLYMORPHISM ON SLEEP QUALITY IN HEALTHY CHINESE YOUTH: A GENDER-SPECIFIC ANALYSIS……195-201

Muwafaq H. Zaya, Ahmed A. J. Mahmood, Musab M. Khalaf.
CROSS SECTIONAL EVIDENCE FOR OPPOSING EFFECTS OF HYPERGLYCAEMIA AND HYPERLIPIDAEMIA ON CHOLINESTERASEACTIVITIES……202-210

Erleta Muçaj, Erëza Durmishi, Serbeze Kabashi Muçaj, Leart Kuçi, Elza Muçaj, Gerta Durmishi.
CHALLENGES IN RADIOLOGICAL DIAGNOSIS: CRANIOPHARYNGIOMA VS ASTROCYTOMA……211-214

Uday Mahajan, Imran Khan, Ria Gupta, Meraj Akhtar, Vibhore Gupta, Edward Spurrier, Mohamed Kabary, Adnan Asif, Salman Shoukat Ali Parpia.
NAMING CONVENTIONS FOR UNIDENTIFIED PATIENTS IN EMERGENCY AND TRAUMA SETTINGS: A NARRATIVE REVIEW……..215-218

Xuexue Li, Wenjie Wen, Dandan Ren.
MOLECULAR MECHANISMS OF DIABETIC PERIODONTITIS: IDENTIFICATION OF KEY OXIDATIVE STRESS-RELATED GENES AND POTENTIAL THERAPEUTIC ROLE OF METFORMIN THROUGH MMP14 AND PXDN……....219-231

Davron Ravshanov, Zilola Mavlyanova, Kholmirzayev Bakhtiyor, Malika Tursunovna, Khalimova Fariza.
HISTOPATHOLOGICAL PREDICTORS AND FUNCTIONAL RECOVERY IN PATIENTS WITH INTRACRANIAL MENINGIOMAS……232-240

Aymuhambetov Y, Khismetova Z A, Iskakova N, Akhmetova K, Serikova-Esengeldina D, Shalgumbayeva G.M.
ASSESSMENT OF QUALITY OF LIFE IN BREAST CANCER PATIENTS BY USING EORTC QLQ-C30 QUESTIONNAIRE IN EAST KAZAKHSTAN REGION……241-248

Yujing Tao, Long Hua, Liu Zhang, Ying Feng, Liying Wen, Weiwei Chang.
THE CORRELATION BETWEEN STRESS, ACADEMIC PERFORMANCE, AND SLEEP DISTURBANCES AMONG HIGH SCHOOL STUDENTS IN ANHUI PROVINCE: A CROSS-SECTIONAL STUDY……249-257

Fahad AlAmr, Muhannad Essa S. Alghamdi, Ahmed Saeed A. Alghamdi, Osama Khamis A. Alghamdi, Hassan Mahfouz B. Alghamdi, Osama Mesfer S. Alghamdi, Abdullah Ali A. Almimoni, Abdulmalik Ahmed S. Al-Zahrani.
PREVALENCE AND ASSOCIATED RISK FACTORS OF NOCTURNAL ENURESIS AMONG CHILDREN AGED 5-18 YEARS IN ALBAHA REGION, SAUDI ARABIA……..258-263

Aya Saad Aldewachi, Mohammed I Aladul.
APPETITIVE TRAITS AND QUALITY OF LIFE IN WOMEN WITH OBESITY USING GLUCAGON-LIKE PEPTIDE-1 RECEPTOR AGONISTS: INSIGHTS FROM A PCOS-ENRICHED SAMPLE……264-269

George Shaburishvili, Nikoloz Shaburishvili, Georg Becker, Solomon Zeikidze, Bacho Tsiklauri.
INCIDENCE OF ADVERSE EVENTS RESULTING FROM BETA-BLOCKER TITRATION IN PATIENTS WITH HEART FAILURE…….270-279

Blushinova A.N, Orazalina A.S, Shalgumbayeva G.M.
INDUCED ABORTION IN KAZAKHSTAN: WOMEN'S PERCEPTIONS AND EXPERIENCES BASED ON CROSS-SECTIONAL STU DY……280-288

Qunru Hu, Liying Wen, Jingqi Zhang, Weiwei Chang, Yuelong Jin, Anshi Wang, Lijun Zhu.
IS CORE SELF-EVALUATION A PROTECTIVE FACTOR FOR COLLEGE STUDENTS'MARITAL ATTITUDES? THE MODERATING ROLE OF PSYCHOLOGICAL STATUS…….289-294

Gulfariza Gani, Ubaidilla Datkhayev, Kairat Zhakipbekov, Serzhan Mombekov, Murat Ashirov, Nurgali Rakhymbayev, Zhanerke Seitova.
STUDY OF THE CHEMICAL COMPOSITION AND ANTIMICROBIAL ACTIVITY OF SUBCRITICAL CO_2 EXTRACT FROM *EUPHORBIA HUMIFUSA* WILLD……295-302

Maysoon Mohammed Hassan, Mohammed Abdulwahab Ati Al-askeri, Naseer Kadhim Jawad.
PROGNOSTIC IMPACT OF EGFR2 AND KI-67 OVEREXPRESSION WITH DOWNREGULATION OF *miR-17* AND *miR-1307* IN FEMALE BREAST CANCER PATIENTS……303-313

Imzharov Talgat Abatovich, Zhakiev Bazylbek Sagidollievich, Sarkulov Marat Nukinovich, Pavlov Valentin Nikolaevich, Kurmangaliev Oleg Maratovich.
THE EFFECTIVENESS OF METAPHYLAXIS OF NEPHROLITHIASIS DURING PERCUTANEOUS NEPHROLITHOTRIPSY: A SYSTEMATIC REVIEW AND META-ANALYSIS……..314-322

Yan Wang, Ting-Ting Wang, Chang-Sheng He.
PROGRESS IN T-CELL IMMUNE RESEARCH ON HYPERLIPIDEMIC PANCREATITIS……323-326

Marwan I Abdullah.
MINING THE CELLMINER DATABASE TO IDENTIFY SHARED BIOMARKERS OF 5-FU AND OXALIPLATIN RESPONSE…...327-341

Shyngys Adilgazyuly, Tolkyn Bulegenov, Akmaral Mussakhanova, Tasbolat Adylkhanov, Kanat Abdilov, Zhannur Altybayeva, Gulmira Bazarova, Malike Kudaibergenova, Makpal Alchimbayeva, Aigul Utegenova, Gulnara Otepova.
ASSESSING THE INFLUENCE OF MEDICAL EDUCATION REFORMS ON ONCOLOGIST WORKFORCE AND LUNG CANCER MORTALITY IN KAZAKH-STAN: AN INTERRUPTED TIME SERIES ANALYSIS WITH PREDICTIVE MOD-ELING OF NATIONWIDE DATA FROM 1998 TO 2023……342-351

Wen-Wen Liu, Zhi-Juan Xu, Fang Xu.
NEW INSIGHTS INTO THE PATHOGENESIS AND TREATMENT ADVANCES OF AGE - RELATED MACULAR DEGENERATION……352-354

Zhamilya Zholdybay, Zhanar Zhakenova, Madina Gabdullina, Yevgeniya Filippenko, Suria Yessentayeva, Galymzhan Alisherov, Aigerim Mustapaeva, Jandos Amankulov, Ildar Fakhradiyev.
^{68}GA-FAPI PET/CT IN DIAGNOSIS OF THE BREAST CANCER DEPENDING ON THE MOLECULAR SUBTYPES AND EXPRESSION STATUS OF HUMAN EPIDERMAL GROWTH FACTOR RECEPTOR 2 (HER2/NEU)……355-363

A.I. Rybin, V.E. Maksymovskyi, O.V. Kuznetsova, V.V. Osyk, A.S. Bohdan.
THE RESULTS OF LIFE QUALITY ASSESSMENT IN PATIENTS WITH PRIMARY OVARIAN CANCER DURING TREATMENT: EFFECT OF DIFFERENT TACTICS AND HIPEC……364-368

Miranda Sejdiu Abazi, Arbër Prokshaj, Shpëtim Prokshaj, Fitim Alidema, Nora Leci, Linda Abazi Morina.
ASSESSMENT OF PRACTICAL PERFORMANCE IN ORTHODONTIC CLASP FABRICATION AMONG DENTAL TECHNICIAN STUDENTS AT UBT: A REAL-TIME ANALYSIS OF WORKING TIME AND PERCEIVED STRESS……369-377

Abylay Baimakhanov, Ainash Oshibayeva, Temirkhan Kozhakhmetov, Nazarbek Omarov, Dinara Akhmetzhanova, Berikuly Duman.
RESULTS OF MEDICAL CARE FOR PERSONS WITH POLYTRAUMA IN ALMATY AND CORRECTION OF THE ORGANIZATIONAL APPROACH……...378-382

Khatia Mikeladze, Nino Chikadze, Nino Gachechiladze, Marina Tediashvili, Irina Datikashvili-David, Peter Lydyard, Nina Porakishvili.
SERUM IL-6, IL-12, AND IL-10 LEVELS IN EARLY-STAGE, UNTREATED CHRONIC LYMPHOCYTIC LEUKEMIA PATIENTS: INSIGHTS FROM GEORGIA……383-387

Musayeva H.H.
FREQUENCY OF COMPLICATIONS IN PATIENTS WITH ADENTIA (BASED ON ARCHIVAL DATA)……388-393

Hong-Xia Wang, Xiao-Xia Hou, Jie Xu.
NURSING RESEARCH ON EMERGENCY GASTROSCOPIC TREATMENT OF UPPER GASTROINTESTINAL FOREIGN BODIES……394-396

Tolegenova Z.Zh, Tokanova Sh.E, Baibussinova A.Zh, Kalikhanova K, Iskakova A.M, Shalgumbayeva G.M.
ASSESSMENT OF INFECTIOUS DISEASE RISK FACTORS, INCLUDING COVID-19, AMONG HEALTHCARE WORKERS IN EAST KAZAKHSTAN REGION……397-405

Bassam A. Al- jabery, Majid R. Al-bahrani.
ENVIRONMENTALLY SAFE $CsPbBr_3$/MXene/MWCNTs HYBRID NANOCOMPOSITES: OPTOELECTRONIC AND STRUCTURAL CHARACTERISTICS FOR POSSIBLE BIOMEDICAL AND HEALTH APPLICATIONS……..……406-414

Hasan AlAidarous.
PIGMENTED VILLONODULAR SYNOVITIS IN THE ANKLE OF A PEDIATRIC PATIENT: A CASE REPORT…….....……..…415-419

Kuat Zhussupov, Nazarbek Omarov, Sagit Imangazinov, Saule Imangazinova, Yernar Kairkhanov, Olga Tashtemirova, Rustem Kazangapov, Aldiyar Masalov, Darkhan Otkenov.
ENDOSCOPIC INJECTION HEMOSTASIS AND LOCAL TREATMENT OF GASTRODUODENAL BLEEDING. LITERATURE REVIEW AND OWN DEVELOPMENTS…….....……..…420-424

GEORGIAN MEDICAL NEWS
No 7-8 (364-365) 2025

PROGNOSTIC MARKERS OF ISCHEMIC AND HEMORRHAGIC COMPLICATIONS IN PATIENTS WITH ATRIAL FIBRILLATION AFTER PERCUTANEOUS CORONARY INTERVENTION

Bolat Ashirov[2], Assel Kassymova[1], Jamilya Mansurova[1], Andrey Orekhov[1], Meiramgul Tokbulatova[3], Mirgul Kapakova[1], Zhanar Toktarova[3], Aisulu Zhunuspekova[1]*.

[1]*Department of Therapy, Semey Medical University, Semey, Kazakhstan.*

[2]*Department of Therapy and Cardiology, South Kazakhstan Medical Academy, Kazakhstan.*

[3]*Department of Internal Medicine, Kazakh National Medical University named after S.D. Asfendiyarov, Kazakhstan.*

Abstract.

Background and Objectives: Patients with acute coronary syndrome (ACS) and atrial fibrillation (AF) undergoing percutaneous coronary intervention (PCI) are at high risk for ischemic and hemorrhagic complications. This study aimed to identify predictors of these complications to optimize risk assessment and management.

Materials and Methods: A retrospective analysis of 92 ACS patients with AF who underwent PCI at Semey Emergency Hospital (2022–2023) was conducted. Patients were followed for one year, and ischemic (myocardial infarction [MI], stroke, stent thrombosis, revascularization, and mortality) and hemorrhagic (BARC types 3 and 5 bleeding) events were recorded. Logistic regression and receiver operating characteristic (ROC) analyses identified significant risk factors.

Results: Ischemic events occurred in 23 patients (25%), including MI (56.5%) and stroke (34.8%). Hemorrhagic events occurred in 14 patients (15.2%), with gastrointestinal bleeding (50%) and hemorrhagic stroke (35.7%) being most common. One-year mortality was 22.8%. Predictors of ischemic events included MI history, reduced left ventricular ejection fraction, elevated pro-brain natriuretic peptide, creatinine, and platelet count, and decreased estimated glomerular filtration rate ($p<0.001$). Predictors of hemorrhagic events included male sex, smoking, peptic ulcer disease, anticoagulant use, low hemoglobin, and elevated international normalized ratio and prothrombin time ($p<0.05$).

Conclusions: Identifying ischemic and hemorrhagic risk factors allows for personalized therapy in ACS patients with AF after PCI, reducing complications and improving outcomes.

Key words. Atrial fibrillation, acute coronary syndrome, dual antithrombotic therapy, percutaneous coronary intervention, ischemic events, hemorrhagic events.

Introduction.

Atrial fibrillation (AF) is the most prevalent sustained arrhythmia among adults, with its incidence continuing to rise due to population aging and the increasing prevalence of risk factors such as hypertension, diabetes mellitus, and cardiovascular diseases [1-3]. Projections indicate that by 2050, the number of AF patients in Asia will reach 72 million, more than twice the estimated number of cases in Europe and the United States [4]. AF significantly elevates the risk of thromboembolic complications, including stroke, cardiovascular events, and mortality [5,6]. A particularly challenging clinical scenario arises when AF coexists with acute coronary syndrome (ACS), necessitating careful selection of antithrombotic therapy [7,8].

Patients with ACS and AF undergoing percutaneous coronary intervention (PCI) are at high risk for both ischemic and hemorrhagic complications [9]. The primary therapeutic approach involves dual antiplatelet therapy (DAPT) to mitigate the risk of stent thrombosis and recurrent cardiovascular events [10]. However, combining DAPT with oral anticoagulants (OAC) in a triple antithrombotic therapy (TAT) regimen increases the risk of bleeding, creating a clinical dilemma: how to balance the reduction of ischemic events without substantially increasing the risk of major bleeding [11,12].

Existing risk assessment models, such as CHA_2DS_2-VASc and HAS-BLED, have limitations in predicting the combined risk of ischemic and hemorrhagic complications in patients with concurrent AF and ACS [13]. These scores were developed based on populations of patients with atrial fibrillation outside the setting of acute coronary syndrome and do not account for the specific course of ACS and the need for combined antithrombotic therapy, which may reduce their prognostic accuracy in cases of atrial fibrillation combined with ACS. For instance, a study by Puurunen et al. demonstrated that the CHA_2DS_2-VASc score had only moderate predictive ability for thrombotic events, whereas HAS-BLED showed no significant prognostic value for bleeding risk [14]. These findings underscore the need for more precise risk stratification tools tailored to this high-risk patient population.

Moreover, existing protocols are often based on data from Western populations and may not take into account the presence of the "East Asian paradox," which is characterized by a lower risk of ischemic complications but a higher risk of bleeding in patients of East Asian origin receiving antithrombotic therapy [15,16]. This phenomenon highlights the importance of ethnic and regional differences in the selection of management strategies. Central Asian populations, including Kazakhstan, may occupy an intermediate position between Western and East Asian models, combining a high prevalence of atherothrombosis, metabolic disorders, and hypertension with a potentially altered bleeding risk profile. This necessitates further research and refinement of prognostic models for use in regional clinical practice.

Thus, the aim of this study was to identify clinical and laboratory predictors of ischemic and hemorrhagic complications in patients with atrial fibrillation and acute coronary syndrome who underwent percutaneous coronary intervention, with the goal of improving risk stratification and individualizing antithrombotic therapy.

Materials and Methods.

This study is a retrospective analysis of data from 92 ACS patients with AF who underwent PCI with stenting. The research was conducted in the Cardiology Department of the Semey Emergency Hospital, Kazakhstan, from January 2022 to December 2023. This study was approved by the local ethics committee (No. 16 dated November 2, 2023). All data were anonymized in compliance with confidentiality requirements.

Inclusion Criteria:

Patients included in the study were diagnosed with ACS, either with ST-segment elevation (STE-ACS) or without ST-segment elevation (NSTE-ACS). Coronary angiography and successful myocardial revascularization with stent implantation were required. Additionally, the presence of AF, whether permanent, persistent, or paroxysmal, was a necessary criterion. All patients were on combined antithrombotic therapy.

Exclusion Criteria:

Patients were excluded if they had contraindications to antithrombotic therapy, terminal-stage oncological diseases, or incomplete clinical data.

All patients received aspirin and a P2Y12 inhibitor (clopidogrel) in combination with oral anticoagulants (OAC). The duration and regimen of therapy were determined by treating physicians based on an individual assessment of thrombotic and bleeding risks.

Endpoints:

The study assessed ischemic events (IE) and hemorrhagic events (HE). Ischemic events included death from any cause, myocardial infarction, stent thrombosis, unplanned revascularization, and ischemic stroke. Hemorrhagic events were defined as major bleeding, classified as types 3 and 5 according to the Bleeding Academic Research Consortium (BARC), and hemorrhagic stroke.

Data Collection:

Data were extracted from the electronic patient record management system. Information included demographic characteristics, disease history, laboratory and instrumental parameters, details of antithrombotic therapy, and treatment outcomes. To clarify the data, discharge summaries from hospital records were used, including information on repeat hospitalizations during the one-year follow-up.

Statistical Analysis:

Statistical analysis was performed using SPSS 23.0 and StatTech 4.7.0 software. Methods of analysis included: for quantitative variables, the Mann–Whitney U test to compare medians, and the Student's t-test to compare means. For categorical variables, Pearson's chi-square test was used to assess relationships between variables, and Fisher's exact test was used for small samples. Receiver operating characteristic (ROC) analysis was carried out to assess the prognostic value of quantitative variables (AUC), as well as their sensitivity/specificity. The criterion for significance was set at $p<0.05$.

Results.

A total of 92 ACS patients with AF were included in the study, with an average age of 68.54±9.06 years. Among them, 61 patients (66.3%) were men with an average age of 67.0±11.3 years, while 31 patients (33.7%) were women with an average age of 73.0±9.5 years. Men were significantly younger than women (p=0.001). No significant differences were observed in the incidence of serious ischemic or hemorrhagic events between STE-ACS and NSTE-ACS (p=0.293), so the analysis was conducted on the combined sample. Patients in the NSTE-ACS group had a history of myocardial infarction (MI) eight times more frequently than those in the STE-ACS group (OR 0.132, 95% CI: 0.051–0.347; p<0.001). Additionally, atrial fibrillation (AF) in medical history was 4.7 times more frequent in the NSTE-ACS group (OR 0.206, 95% CI: 0.085–0.501; p<0.001).

Main Clinical Events:

Ischemic events occurred in 23 patients (25%), including MI in 13 cases (56.5%), ischemic stroke in 8 cases (34.8%), venous thrombosis in 1 case (4.3%), and stent restenosis in 1 case (4.3%). Bleeding events were observed in 14 patients (15.2%), with gastrointestinal bleeding occurring in 7 cases (50%), hemorrhagic stroke in 5 cases (35.7%), and other types of bleeding in 2 cases (14.3%). The overall mortality rate was 22.8% (n=21), with 8 patients (38.1%) dying in the hospital within the first week and 13 patients (61.9%) dying within one year.

Patients in the study were divided into two groups based on the presence or absence of ischemic events: those without ischemic events (n=69, 75%) and those with ischemic events (n=23, 25%). Similarly, they were categorized into those without hemorrhagic events (n=78, 84.8%) and those with hemorrhagic events (n=14, 15.2%). All patients received aspirin and a P2Y12 inhibitor, supplemented by oral anticoagulants (OAC). Follow-up lasted for one year.

Univariate regression analysis identified several significant risk factors for ischemic events. A history of MI was associated with increased risk (OR 6.336, 95% CI: 2.097–19.144; p<0.001), as was reduced left ventricular ejection fraction (LVEF) (OR 0.893, 95% CI: 0.837–0.952; p<0.001). Elevated pro-BNP levels (OR 1.0, 95% CI: 1.0–1.0; p=0.003) and higher creatinine levels (OR 1.052, 95% CI: 1.027–1.076; p<0.001) were also linked to ischemic complications. Additionally, a lower estimated glomerular filtration rate (eGFR) (OR 0.898, 95% CI: 0.856–0.943; p<0.001) and increased platelet count (OR 1.013, 95% CI: 1.004–1.021; p=0.003) were associated with a higher likelihood of ischemic events. The CHA_2DS_2-VASc score was not statistically significant (OR 0.984, 95% CI: 0.688–1.405; p=0.928).

Several variables were found to significantly influence the risk of bleeding. Male sex was strongly associated with an increased risk (OR 8.125, 95% CI: 1.011–65.328; p=0.049), as was smoking status (OR 4.444, 95% CI: 1.363–14.497; p=0.013). A history of peptic ulcer disease (PUD) (OR 2.462, 95% CI: 1.395–4.345; p=0.002) and the use of OAC (OR 7.371, 95% CI: 1.546–35.151; p=0.012) also contributed to a higher risk of hemorrhagic events. Lower hemoglobin levels (OR 0.959, 95% CI: 0.933–0.985; p=0.002), prolonged prothrombin time (PT) (OR 1.015, 95% CI: 0.983–1.049; p=0.025), and elevated international normalized ratio (INR) (OR 3.096, 95%

CI: 1.248–7.681; p=0.015), HAS-BLED (OR 2.373, 95% CI: 1.074–5.244; p=0.033), were also significant predictors of bleeding complications. The PRECISE-DAPT variable was not statistically significant (OR 1.032; 95% CI 0.982-1.085; p=0.216).

ROC analysis was performed to assess the prognostic value of various clinical and laboratory parameters in predicting ischemic and hemorrhagic complications in AF patients following PCI. This analysis enabled the determination of optimal cutoff values for predictors, their sensitivity and specificity, and the area under the curve (AUC).

To determine the critical values of quantitative predictors, ROC analysis was performed with the construction of ROC curves (see Figures 1 and 2).

For several variables (in particular, LVEF and eGFR), the AUC was significantly less than 0.5, which reflects an inverse prognostic relationship: a decrease in these indicators is associated with an increased risk.

ROC curves located below the reference line (AUC < 0.5) reflect an inverse prognostic relationship: a decrease in hemoglobin level is associated with an increased risk of bleeding.

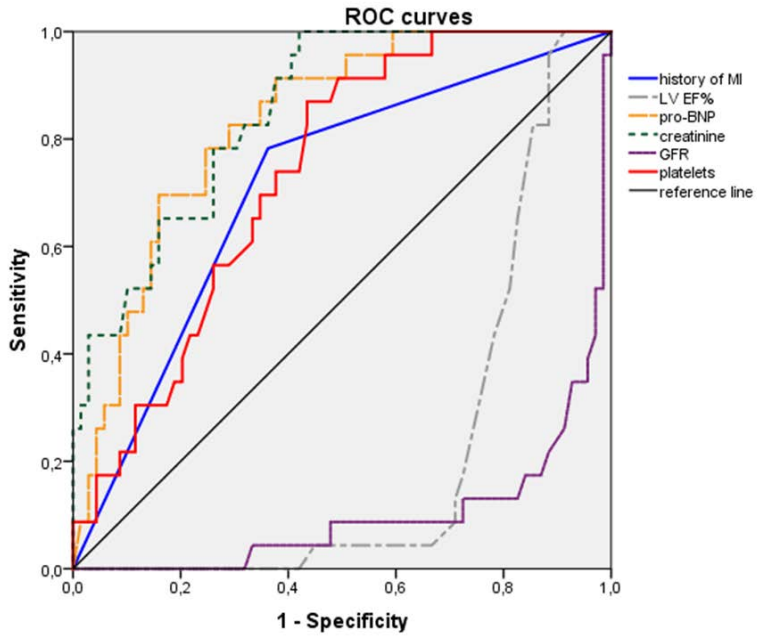

Figure 1. *ROC Curves for Independent Risk Factors of Ischemic Events in ACS Patients with AF After PCI.*

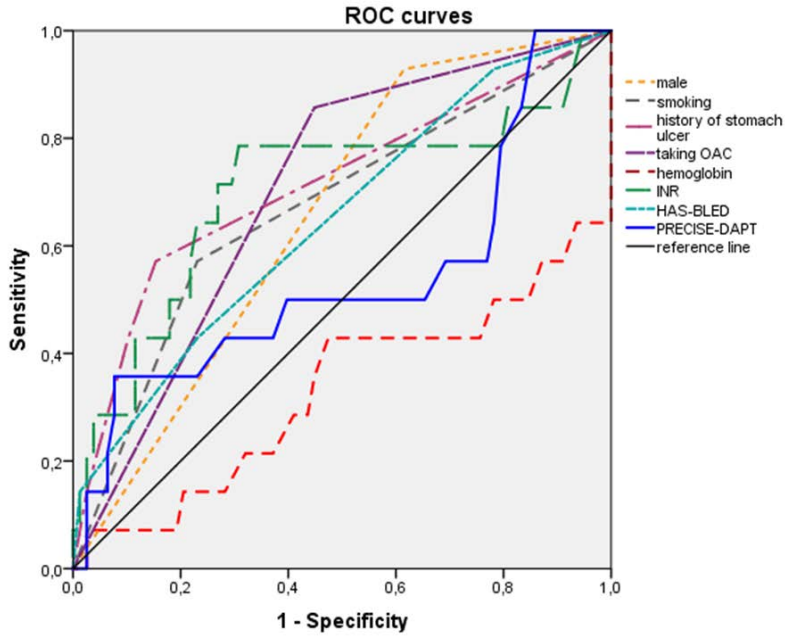

Figure 2. *ROC Curves for Independent Risk Factors of Hemorrhagic Events in ACS Patients with AF After PCI.*

Table 1. *Comparative characteristics of ACS patients with AF after PCI in groups with and without ischemic events.*

Indicator	**Patients without IE (n=69; 75%)**	**Patients with IE (n=23; 25%)**	**p-value**
Age, years	68,35±9,10 (46–85)	69,13±9,12 (57–94)	0,722*
Male, n(%)	46(66,7%)	15(65,2%)	1,000 [b]
BMI, kg/m2	28,60(8,50) (21,8–46,6)	29,40(8,0) (22,00–44,6)	0,850**
Smoking, n(%)	19(27,5%)	7(30,4%)	0,794[b]
Diabetes mellitus, n(%)	24(34,8%)	7(30,4%)	0,802[b]
History of stroke, n(%)	11(15,9%)	4(17,4%)	1,000[b]
MI history, n(%)	25(36,2%)	18(78,3%)	0,001[a]
AF history, n(%)	34(49,3%)	11(47,8%)	0,904[a]
CHA2DS2-VASc	4(2) (1-7)	4(2) (2-7)	0,926**
ABP systolic, mm Hg	130(25) (80–180)	130(30) (90–180)	0,412**
ABP diastolic, mm Hg	80(20) (50–110)	80(10) (60–100)	0,485**
HR, beats per minute	82(22) (35–150)	82(32) (52–190)	0,211**
LV EF, %	50(19) (24–69)	40(4) (35–53)	<0,001**
Troponin ng/mL.	0,10 (2,37) (0,10–2,45)	1,31(4,73) (0,10–4,31)	0,057**
D-dimer ng/mL.	0,00 (175,0) (0,00; 5300)	0,00 (1400) (0,00; 8630)	0,747**
NT-proBNP pg/mL	1042,70 (1735,2) (0,0–35000,0)	5331,00 (12834,9) (659,0–35000,0)	<0,001**
Creatinine, μmol/L	80,0 (36,5) (40,0–144,0)	122,0 ±52,0 (85,7–224,0)	<0,001*
GFR	77,0 (28) (26–111)	49,0±20,0 (21–88)	<0,001*
Platelet count	213 (76) (44–377)	256 (77) (188–439)	<0,001**

Note
*- parametric criteria—student t-test, M±SD (mean ± standard deviation); min and max values
**- nonparametric test—Mann-Whitney U-test, Me(IQR) (median(interquartile range)); min and max values; nominal variables (absolute number of patients (%))[a] - $\chi 2$ Pearson
[b] - Fisher test
BMI—body mass index; HR-heart rate; LV EF—left ventricular ejection fraction; GFR–glomerular filtrate rate.

Table 2. *Comparative characteristics of ACS patients with AF after PCI in groups with and without hemorrhagic events.*

Indicator	**Patients without HE (n=78; 84,8%)**	**Patients with HE (n=14; 15,2%)**	**p-value**
Age, years	69,06 ± 9,33 (46–94)	65,64 ± 6,98 (58–79)	0,195*
Male, n(%)	1 (3,2%)	13 (21,3%)	0,049[b]
Smoking, n(%)	6 (9,1%)	8 (30,8%)	0,013[b]
History of peptic ulcer disease, n(%)	12 (60,0%)	8 (40,0%)	0,002[b]
use of OAC, n(%)	2 (4,4%)	12 (25,5%)	0,012[b]
HAS-BLED	2 (0) (1-4)	2 (1) (1-4)	0,033**
PRECISE-DAPT	21(10) (2-56)	20(22) (11-50)	0,216**
HR, beats per minute	82(24) (35–190)	85(25) (62-150)	0,553**
ABP systolic, mm Hg	130(20) (80–180)	130(30) (80-180)	1,000**
ABP diastolic, mm Hg	80(20) (50–110)	85(13) (60-90)	0,665**

Hemoglobin, g/L	134,13±15,66 (88–172)	109,93±39,02 (35–162)	0,002*
Erythrocytes	4,58 ± 0,57 (3,30–6,0)	3,95±1,28 (1,85–6,45)	0,092*
Hct %	39(5,3) (26–50)	39,5(15,4) (13–49)	0,333**
Platelet count	232,50 ± 65,85 (104–439)	217,79± 68,32 (44–309)	0,446*
INR	1,07(0,20) (0,83–3,70)	1,27(0,84) (0,88–4,08)	0,015**
APTT	29,20(13,3) (0–140)	32,55(11,6) (21,1–114)	0,135**
PT	11,65(2,6) (9,1–129)	15,50(9,1) (9,6–45)	0,025**
PI	85,18 ± 26,87 (26,6–146,9)	69,57 ± 32,25 (16,3–126,9)	0,056*
GFR	71,24 ± 23,01 (21–111)	73,00 ± 17,02 (49–111)	0,786*
NT-proBNP pg/mL	1398,50(5084,4) (0–35000)	1415,55(1712,0) (199,2–3868,0)	0,845**
LV EF, %	45,50(20) (24–69)	47,00(16) (38–61)	1,000**

Note
*- parametric criteria—student t-test, M±SD (mean ± standard deviation); min and max values
**- nonparametric test—Mann-Whitney U-test, Me(IQR) (median(interquartile range)); min and max values; nominal variables (absolute number of patients (%)) a - $\chi 2$ Pearson
b - Fisher test
HR-heart rate; Hct- hematocrit; INR-international normalized ratio; APTT- activated partial thromboplastin time; PT- prothrombin time; PI-prothrombin index; GFR–glomerular filtrate rate; LV EF-left ventricular ejection fraction.

Table 3. *Summary table of ROC analysis results for ischemic events.*

Variable	**AUC**	**95% CI**	**p**	**cutoff values**	**sensitivity**	**specificity**
history of MI	0,710	0,590– 0,830	0,003	-	0,783	0,638
LVEF %	0,216	0,124 – 0,308	0,000	≤ 43,5%	0,130	0,290
pro-BNP	0,829	0,743 – 0,916	0,000	≥ 1010,5	0,957	0,493
Creatinine level	0,852	0,772 – 0,931	0,000	≥ 85,85	0,957	0,580
eGFR)	0,100	0,023 – 0,178	0,000	≤ 67	0,087	0,667
Platelet count	0,733	0,629 – 0,837	0,001	≤ 225,5	0,739	0,580

Table 4. *Summary table of ROC analysis results for hemorrhagic events.*

Variable	**AUC**	**95% CI**	**p**	**cutoff values**	**sensitivity**	**specificity**
male sex	0,657	0,522 – 0,791	0,063	-	0,929	0,385
smoking	0,670	0,507 – 0,834	0,043	-	0,571	0,769
history of peptic ulcer disease	0,714	0,549 – 0,879	0,011	-	0,571	0,846
The use of OAC	0,704	0,570 – 0,838	0,015	-	0,857	0,551
hemoglobin levels	0,331	0,148 – 0,513	0,044	≤ 123,5 г/л	0,429	0,244
INR	0,703	0,527 – 0,879	0,016	≥ 1,085	0,786	0,551
HAS-BLED	0,647	0,488 – 0,807	0,080	≥ 1,5	0,929	0,218
PRECISE-DAPT	0,540	0,351 – 0,730	0,632	≥ 13,5	0,643	0,218

Discussion.

Key findings:

This study identified key predictors of ischemic and hemorrhagic events in AF patients after PCI. Elevated NT-proBNP and creatinine levels, platelet count, reduced LVEF, and decreased eGFR were independent risk factors for ischemic complications. These findings are consistent with international studies that confirm the role of heart failure and renal dysfunction in predicting adverse outcomes. In our study OAC use, and hemoglobin levels emerged as the most significant predictors of bleeding risk. These findings are in line with the recommendations of the European Society of Cardiology (ESC), which emphasize the importance of hemostasis monitoring and bleeding prevention in AF patients [17,18].

Strengths and limitations:

International guidelines recommend the use of triple antithrombotic therapy (TAT) as the default strategy in patients with AF for the first week after PCI. In cases of high bleeding risk and low thrombotic risk, an early transition to dual antithrombotic therapy (DAT) is recommended for long-term treatment [10,19]. Individualized selection of antithrombotic therapy plays a crucial role in reducing complications [3,20].

These findings align with international research emphasizing the central role of heart failure in recurrent ischemic events in AF patients undergoing PCI [18]. Additionally, a study by Nasab Mehrab et al. demonstrated that pro-BNP levels and reduced LVEF are strong prognostic markers of adverse outcomes in AF patients ([21]. Renal dysfunction emerged as a significant risk factor for adverse outcomes, as confirmed by our findings and international guidelines [22].

Elevated creatinine and decreased eGFR require close monitoring and treatment adjustments. In the male subgroup, the risk of major bleeding was significantly higher (OR 8.125), which may be attributed to a higher prevalence of additional risk factors such as smoking. Patients with a history of peptic ulcer disease, a well-established risk factor for bleeding under antithrombotic therapy, require gastroprotection to mitigate this risk. High INR levels (>1.16) reflect an increased risk of coagulation disturbances, while a drop in hemoglobin (<88 g/L) may indicate latent bleeding. The study highlights the importance of personalized antithrombotic management, in line with current guidelines emphasizing individualized risk assessment. The main limitation of our study is the small sample size, the short follow-up period, and its retrospective design, which complicated the evaluation of patients' adherence to therapy.

Comparison with similar research:

Current recommendations rely on risk assessment scores to estimate individual probabilities of thrombosis and bleeding [17,20]. Despite the availability of various risk assessment scales, such as GRACE, CHA2DS2-VASc, HAS-BLED, CRUSADE, BARC, and PRECISE-DAPT, none is specifically designed for patients with a combination of ACS and AF [23]. In a study by Puurunen et al., CHA2DS2-VASc was found to be only a moderate predictor of thrombotic events (p=0.57), while HAS-BLED was ineffective in predicting bleeding (p=0.51) [14]. Similarly, in our study, HAS-BLED did not demonstrate significant prognostic value (OR 2.373, 95% CI: 1.074–5.244; p=0.033), PRECISE-DAPT showed no statistically significant differences (OR 1.032; 95% CI 0.982-1.085; p=0.216), and CHA2DS2-VASc also proved to be statistically insignificant (OR 0.984, 95% CI: 0.688–1.405; p=0.928).

Renal dysfunction is a recognized predictor of poor outcomes in ACS patients, as reduced eGFR and increased creatinine levels are linked to a higher risk of cardiovascular events, including recurrent MI and mortality (Ranucci et al., 2018) [24]. In our study, the critical creatinine threshold was 85.7 μmol/L, which corresponds with data from the ACEF score (Barili et al., 2014) [25]. The ACEF scale, incorporating age, LVEF, and creatinine levels, has proven effective in stratifying high- and low-risk patients for planned cardiac surgery compared to more complex scoring systems, as well as in PCI. Furthermore, ACEF II includes anemia (hematocrit <36%), allowing for additional prognostic considerations (Ranucci et al., 2018) [24]. Our results reinforce the significance of renal dysfunction as an independent risk factor for severe cardiovascular complications in ACS patients. Hemorrhagic events in ACS patients can significantly worsen the prognosis. A meta-analysis of the GUSTO IIb, PURSUIT, and PARAGON B studies, which included over 24,000 patients, demonstrated that those who received blood transfusions during hospitalization had a substantially higher risk of mortality and recurrent MI within 30 days after ACS [26]. The use of the BARC (Bleeding Academic Research Consortium) classification enabled the determination that type 2 or higher bleeding events were associated with an increased risk of recurrent ischemic events, whereas type 1 bleeding had no significant impact [27]. Mortality rates following recurrent MI were found to be lower than after class 3c bleeding events [28].

The PARIS (Patterns of Non-Adherence to Anti-Platelet Regimen in Stented Patients) study identified the use of anticoagulants as part of triple antithrombotic therapy as a significant predictor of bleeding risk. In our study, the use of anticoagulants was also associated with a higher risk of bleeding [29]. The ORACUL study incorporated factors such as age, creatinine levels, hemoglobin levels, peptic ulcer disease history, and OAC use. The ORACUL score demonstrated good prognostic value in assessing the risk of significant bleeding events within one year in ACS patients [30].

Explanations of findings:

Based on our study results, several conclusions can be drawn. TAT is effective in patients with a high ischemic risk; however, its use should be limited to one week to reduce the risk of bleeding. Prolonged use of P2Y12 inhibitors (such as clopidogrel) in combination with OAC appears to be a safer strategy for most patients, minimizing bleeding risks while maintaining efficacy in preventing ischemic complications. Our findings are consistent with ESC guidelines and major studies, including work by Hindricks et al., which highlights the significance of personalized antithrombotic therapy based on ischemic and bleeding risks [18].

Implications and actions needed:

The primary risk factors for ischemic events included high pro-BNP levels, which serve as a marker of heart failure associated with increased preload and myocardial dysfunction. Elevated pro-BNP levels were correlated with a higher incidence of ischemic events, supporting previous research highlighting its strong prognostic value in ACS and AF [21]. Reduced LVEF, reflecting impaired cardiac pump function, was linked to a higher likelihood of recurrent ischemic events. In our study, LVEF below 45% was an independent predictor of poor outcomes.

In this study, the risk of bleeding was higher in men and patients with a history of peptic ulcer disease, as well as those with elevated INR and decreased hemoglobin levels. These findings highlight the importance of monitoring coagulation parameters and adjusting anticoagulant dosages to reduce hemorrhagic complications. This study underscores the need for a personalized approach in managing AF patients after PCI. Identifying predictors of ischemic and hemorrhagic

complications allows for risk minimization and optimization of treatment outcomes. To achieve an optimal balance between ischemic and hemorrhagic risks in high-risk patients, a scoring system integrating both stent thrombosis, stroke, and systemic embolism risks, along with bleeding risks, is necessary. Such an approach would simplify clinical decision-making regarding antithrombotic therapy and help tailor anticoagulation strategies to the clinical profile of each patient.

Study limitations:

The main limitation of this study is the small sample size, the short follow-up period of one year, and its retrospective design, which may introduce information bias due to reliance on electronic medical records and discharge summaries for data collection. Future prospective studies with larger cohorts are necessary to validate the identified predictors and develop more accurate risk stratification models. This would facilitate optimization of antithrombotic therapy, enhancing both the safety and efficacy of treatment in this high-risk population.

Conclusion.

As a result of this study, predictors of unfavorable outcomes in ACS patients with AF after PCI were identified. Predictors of ischemic outcomes included a history of MI, elevated NT-proBNP, decreased LVEF, elevated creatinine, low eGFR, and a high platelet count.

Predictors of hemorrhagic outcomes included male sex, a history of peptic ulcer disease, low hemoglobin, anticoagulant use, and elevated INR and prothrombin time.

The data obtained confirm that ischemic and hemorrhagic events in AF patients post-PCI are associated with clinical and laboratory parameters, indicating the necessity of regular monitoring of key predictors to minimize the risk of complications.

Author Contributions: conceptualization, J.M., A.K., A.Z., B.A., M.T. M.K., Z.T., A.O.; methodology, J.M., A.K., A.Z., B.A., A.O., M.T. M.K., Z.T; software, J.M., A.K., A.Z., B.A., M.T. M.K., Z.T.; validation, J.M., A.K., A.Z., B.A., A.O., M.T. M.K., Z.T.; formal analysis, J.M., A.K., A.Z., B.A.,.; investigation, J.M., A.K., A.Z., B.A., M.T. M.K., A.O., Z.T data curation, J.A., A.A., A.S., B.A., M.O. M.K., Z.T.; writing—original draft preparation, J.A., A.A., A.; writing—review and editing, J.M., A.K., A.Z., B.A., A.O., M.T. M.K., Z.T.; visualization, J.M., A.K., A.Z., B.A., A.O., M.T. M.K., Z.T, supervision, J.M., A.K., B.A., project administration, J.M., A.A.; funding acquisition, J.M. All authors have read and agreed to the published version of the manuscript.

Funding: This work was carried out within the framework of grant funding for scientific startups of teaching staff at the NJSC "Semey Medical University" for 2022–2025 under the project: "Improvement of antithrombotic therapy in patients with acute coronary syndrome after percutaneous coronary intervention with comorbid conditions."

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Not applicable.

Conflicts of Interest: None of the authors have any conflicts of interest to disclosure.

Ethical Approval: This study was approved by the local ethics committee (No. 16 dated November 2, 2023). All data were anonymized in compliance with confidentiality requirements.

REFERENCES

1. Rivas Rios JR, Franchi F, Rollini F, et al. Diabetes and antiplatelet therapy: From bench to bedside. Vol. 8, Cardiovascular Diagnosis and Therapy. AME Publishing Company. 2018:594-609.
2. Murphy A, Banerjee A, Breithardt G, et al. The World Heart Federation Roadmap for Nonvalvular Atrial Fibrillation. Glob Heart. 2017;12:273-284.
3. Wijesurendra RS, Casadei B. Mechanisms of atrial fibrillation. Heart. 2019;105:1860-7.
4. Tse HF, Wang YJ, Ahmed Ai-Abdullah M, et al. Stroke prevention in atrial fibrillation - An Asian stroke perspective. Heart Rhythm. 2013;10:1082-8.
5. Goette A, Kalman JM, Aguinaga L, et al. EHRA/HRS/APHRS/SOLAECE expert consensus on atrial cardiomyopathies: Definition, characterization, and clinical implication. Heart Rhythm. 2017;14:e3-40.
6. Campbell BCV, De Silva DA, Macleod MR, et al. Ischaemic stroke. Nat Rev Dis Primers. 2019;5.
7. Goette A. Antithrombotic therapy after coronary artery stenting in atrial fibrillation: dual therapy encompassing NOAC plus P2Y12 inhibitor is ready for prime time! Ann Transl Med. 2019;78:S70-S270.
8. Jones DW, Minhas S, Fierro JJ, et al. From WOEST to AUGUSTUS: a review of safety and efficacy of triple versus dual antithrombotic regimens in patients with atrial fibrillation requiring percutaneous coronary intervention for acute coronary syndrome. Ann Transl Med. 2019;7:405-405.
9. Xu K, Chan NC. Bleeding in patients with atrial fibrillation treated with combined antiplatelet and anticoagulant therapy: time to turn the corner. Ann Transl Med. 2019;7:S198-S198.
10. Byrne RA, Rossello X, Coughlan JJ, et al. 2023 ESC Guidelines for the management of acute coronary syndromes. Eur Heart J. 2023;44:3720-826.
11. Kirolos I, Ifedili I, Maturana M, et al. Ticagrelor or prasugrel vs. clopidogrel in combination with anticoagulation for treatment of acute coronary syndrome in patients with atrial fibrillation. Ann Transl Med. 2019;7:406-406.
12. Esmonde S, Sharma D, Peace A. Antiplatelet agents in uncertain clinical scenarios-a bleeding nightmare. Cardiovascular Diagnosis and Therapy. 2018;8:647-62.
13. Piccini JP, Singer DE. Putting risk prediction in atrial fibrillation into perspective. European Heart Journal. 2012;33:1431-3.
14. Puurunen MK, Kiviniemi T, Schlitt A, et al. CHADS2, CHA2DS2-VASc and HAS-BLED as predictors of outcome in patients with atrial fibrillation undergoing percutaneous coronary intervention. Thromb Res. 2014;133:560-6.
15. Jeong YH, Tantry US, Omar M, et al. “East Asian Paradox” Revisited: Precision Medicine for Antithrombotic Strategies Tailored to Atherothrombotic Cardiovascular Risks. Journal of Cardiovascular Intervention. 2024;3:119.

16. Kang J, Kim HS. The evolving concept of dual antiplatelet therapy after percutaneous coronary intervention: Focus on unique feature of east Asian and "Asian paradox." Korean Circulation Journal. Korean Society of Cardiology. 2018;48:537-51.
17. Van Gelder IC, Rienstra M, Bunting K V, et al. 2024 ESC Guidelines for the management of atrial fibrillation developed in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS). Eur Heart J. 2024;45:3314-414.
18. Hindricks G, Potpara T, Dagres N, et al. 2020 ESC Guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS). Eur Heart J. 2021;42:373-498.
19. Hindricks G, Potpara T, Kirchhof P, et al. 2020 ESC Guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS). European Heart Journal. Oxford University Press. 2021;42:373-498.
20. Potpara TS, Mujovic N, Proietti M, et al. Revisiting the effects of omitting aspirin in combined antithrombotic therapies for atrial fibrillation and acute coronary syndromes or percutaneous coronary interventions: Meta-analysis of pooled data from the PIONEER AF-PCI, RE-DUAL PCI, and AUGUSTUS trials. Europace. 2020;22:33-46.
21. Nasab Mehrabi E, Toupchi-Khosroshahi V, Athari SS. Relationship of atrial fibrillation and N terminal pro brain natriuretic peptide in heart failure patients. ESC Heart Failure. John Wiley and Sons Inc; 2023;10:3250-7.
22. Di Mauro M, Fiorentini V, Mistrulli R, et al. Acute coronary syndrome and renal impairment: A systematic review. Reviews in Cardiovascular Medicine. IMR Press Limited; 2022;23.
23. Zhang HH, Liu Q, Zhao HJ, et al. Predictive validation of existing bleeding and thromboembolic scores in elderly patients with comorbid atrial fibrillation and acute coronary syndrome. Journal of Geriatric Cardiology. 2023;20:330-340.
24. Ranucci M, Pistuddi V, Scolletta S, et al. The ACEF II Risk Score for cardiac surgery: Updated but still parsimonious. Eur Heart J. 2018;39:2183-9.
25. Barili F, Pacini D, Grossi C, et al. Reliability of new scores in predicting perioperative mortality after mitral valve surgery. In: Journal of Thoracic and Cardiovascular Surgery. 2014:1008-12.
26. Rao SV, Jollis JG, Harrington RA, et al. Relationship of Blood Transfusion and Clinical Outcomes in Patients with Acute Coronary Syndromes. JAMA. 2004;292:1555-62.
27. Mehran R, Rao SV, Bhatt DL, et al. Standardized bleeding definitions for cardiovascular clinical trials: A consensus report from the bleeding academic research consortium. Circulation. 2011;123:2736-47.
28. Caneiro-Queija B, Abu-Assi E, Raposeiras-Roubín S, et al. Differential Prognostic Impact on Mortality of Myocardial Infarction Compared with Bleeding Severity in Contemporary Acute Coronary Syndrome Patients. Revista Española de Cardiología (English Edition). 2018;71:829-836.
29. Baber U, Mehran R, Giustino G, et al. Coronary Thrombosis and Major Bleeding After PCI With Drug-Eluting Stents Risk Scores From PARIS. 2016.
30. Brazhnik VA, Minushkina LO, Guliev RR, et al. Bleeding risk factors in patients with acute coronary syndrome: Data from observational studies ORACUL II. Russian Journal of Cardiology. 2019;24:7-16.