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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии
საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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

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

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

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

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

WEBSITE

www.geomednews.com

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 საქმრალდებოლ!

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. რენტგენოგრაფიების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შედეგების ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

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

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

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

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

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

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

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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CARDIORENAL SYNDROME AND COVID-19

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Abstract.

The purpose of this paper is to analyse the cases with cardiorenal syndrome, and the ratio of cardiovascular disease and COVID-19. Prospective methods were used to conduct this research, including the period (January 2020-December 2021). Cases of patients treated at the Nephrology Clinic at the University Clinical Center of Kosovo (UCCK) have been studied. The categorical variables were analyzed with the χ^2 test and the Fisher exact test. The study included 120 patients with acute renal disease treated at the Nephrology Clinic at the University Clinical Center of Kosovo (UCCK), of which 46 (38.3%) female and 74 (61.6%) male. Of the 120 patients included in the study 4 were 18-34 years old, 8 were 35-49 years old, 30 were 50-64 years old, and 78 were > 65 years old. There is a strong link between cardiorenal syndrome and age. Regarding cardiorenal syndrome and its association with other diseases in this prospective study were found these concomitant diseases such as: diabetes mellitus type 2, secondary anemia, hypothyroidism, hyperparathyroidism, pneumonia, sepsis, ascites, mesenteric tumor, hyperkalemia, and Covid-19 Infection. There is a strong link between cardiorenal syndrome and COVID-19 Infection. In recent decades various studies have been done against the definition of cardiorenal syndrome, the understanding of pathophysiology, the use of new biomarkers that represent a new dimension in the diagnostic algorithm, and the difficulties in treating this syndrome.

Key words. Cardiorenal syndrome, acute renal impairment (ACI), heart failure (HF), COVID-19.

Introduction.

A spate of pneumonia cases with no known etiology surfaced in Wuhan around the end of 2019 (Hubei, China). A few weeks later, in January 2020, deep sequencing analysis of lower respiratory tract samples discovered a novel virus causing severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) as the etiological culprit for that noted pneumonia cluster.

On February 11th, 2020, the World Health Organization (WHO) Director-General, Dr. Tedros Adhanom Ghebreyesus, named the disease caused by the SARS-CoV-2 as "COVID-19", and by March 11th, 2020, when the number of countries involved was 114, with more than 118,000 cases and over 4000 deaths, the WHO declared the pandemic status [1].

The CoVs are genotypically and serologically detached into four subfamilies: α , β , γ , and δ -CoVs. α and β -CoVs are responsible for human CoV infections. SARS coronavirus (SARS-CoV) and MERS coronavirus (MERS-CoV) are members of β -CoVs [2]. SARS-CoV-2 belongs to the lineage B (Sarbecovirus) of β -CoVs [3].

Similar to SARS-CoV, human angiotensin-converting enzyme 2 (ACE2) is a functional receptor that SARS-CoV-2 has hijacked

for cell entrance [4]. ACE2 is a type I membrane protein mostly linked to cardiovascular disorders and is expressed in the lung, heart, kidneys, and intestines [5]. According to recent research, COVID-19 is a multisystemic inflammatory vasculopathy focusing on endothelial dysfunction, which directly and indirectly results in issues with the heart and kidneys. Significant COVID-19 problems are more likely to develop when underlying comorbidities such as hypertension, diabetes, obesity, smoking, and cardiovascular illnesses are present.

This is one of the factors contributing to the greater mortality and morbidity rates associated with COVID-19 infection in the older population, who have a higher prevalence of chronic comorbidities [6].

Up to 20–30% of COVID-19 patients who are hospitalized show evidence of myocardial involvement manifested by elevated troponin levels. Myocardial injury can occur through several different pathways, such as Type 1 or Type 2 myocardial infarction, myocarditis, vasculitis, or other mechanisms involving inflammation, thrombosis, and/or stress. If there is persistent inflammation or fibrosis, there may be a significant scale depending on the type of cardiac injury. Early detection and care may enhance long-term outcomes if the degree and distribution of fibrosis result in electrophysiologic abnormalities that increase the risk of atrial fibrillation and ventricular arrhythmias [7].

The theorized pathways for kidney damage once SARS-CoV-2 enters the bloodstream include sepsis, cytokine storm, and direct cellular injury. Nearly a hundred times more ACE2 is expressed in kidney tubules than in lungs. If this is supported by the SARS-higher CoV-2's binding affinity to ACE2 than the SARS-CoV, it may help to explain and explain the observed differences between the two infections in terms of a direct viral attack on the kidney. Other elements that could harm kidney function include the presence of hemodynamic instability and concurrent medications that could have an immunologic or tubular-specific toxic effect [8].

The condition of the heart and kidneys, in which acute or chronic malfunction in one organ may lead to acute or chronic dysfunction in the other, is known as cardiorenal syndrome (CRS). Five subcategories of various syndromes were categorized and identified. Acute CRS (type 1) is characterized by an acute worsening in cardiac function (AHF-ACS), leading to kidney injury or dysfunction. Chronic abnormalities in cardiac function (CHF-CHD) resulting from kidney damage or malfunction are referred to as chronic cardio-renal syndrome (type 2). Acute kidney injury (AKI) leading to heart injury or dysfunction, is known as acute reno-cardiac syndrome (type 3). Chronic renal disease leading to heart injury, disease, and/or dysfunction is known as chronic reno-cardiac syndrome (type 4). Finally, systemic diseases that simultaneously injure and/or

cause renal and cardiac malfunction are known as secondary CRS (type 5) [9].

Type 1 CRS refers to AKI caused on by direct cardiac injury or cardiac dysfunction caused by Acute distress respiratory syndrome (ARDS) itself. On the other hand, type 5 CRS's pathophysiology is defined by the onset of heart and kidney damage caused by the systemic effects of inflammation. From a microvascular perspective, the cytokines released as a result of systemic inflammation, increased vascular permeability as a result of endothelial activation, the development of renovascular microthrombi, intravascular fluid depletion or, conversely, venous congestion as a result of volume overload, and an excessive amount of vasoactive or fluid therapy could all be factors in the decline in kidney function [6].

The aim of this research is: analysis of cases with cardiorenal syndrome, the ratio of kidney diseases to heart diseases, the ratio of cardiovascular disease and COVID-19, identification of the average age of patients, the ratio of the occurrence of cardiorenal syndrome between the two sexes, association of cardiorenal syndrome with concomitant diseases and mortality in cardiorenal syndrome.

Purpose of the paper.

The purpose of this paper is to analyse cases with cardiorenal syndrome, the ratio of kidney diseases to heart diseases, the ratio of cardiovascular disease and COVID-19, identification of the average age of patients, the ratio of the occurrence of cardiorenal syndrome between the two sexes, association of cardiorenal syndrome with concomitant diseases and mortality in cardiorenal syndrome.

Materials and Methods.

We conducted a prospective cohort study, period from January 2020 to December 2021. 120 patients with cardiorenal syndrome treated in the nephrology clinic of UCCK were studied, 41 of them confirmed with a positive COVID -19 test through the polymerase chain reaction (PCR). Cardiac and renal echodopler, other complementary biochemical and radiological methods for staging renal and cardiac disease were performed.

PCR test for COVID-19. This study was carried out in accordance with the Helsinki Declaration Principles. The confidentiality of patients is maintained according to ethical rules. The ethical committee of the Faculty of Medicine of the University of Prishtina approved this study on 10.05.2022 by the decision letter with nr. 4434. 120 patients, 74 were men and 46 were women, aged 18-87 years, were included.

The paper was written in Microsoft Word, while the Microsoft Excel program was used for grouping, processing, and calculating statistical parameters. The categorical variables were analyzed with the X2 test, the Fisher exact test. Data are presented through tables, figures, and comments.

Results and Discussion.

The study included 120 patients with acute renal disease treated at the Nephrology Clinic at the University Clinical Center of Kosovo (UCCK), of whom 46 (38.3%) were women and 74 (61.6%) were men (Figure 1).

From the presentation of the ratio between the two sexes, it is seen that men are more affected by cardiorenal syndrome. Of

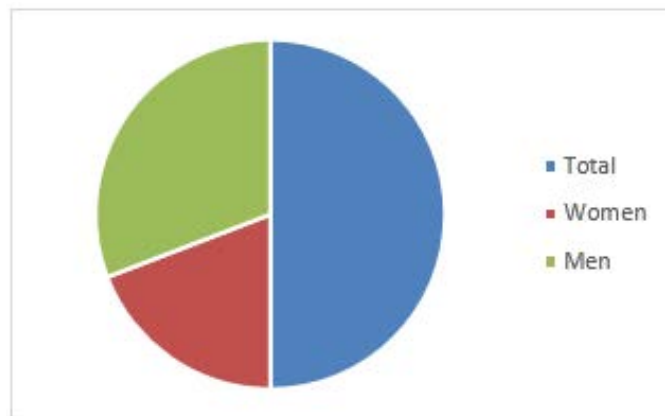


Figure 1. Men/women ratio of patients in the study.

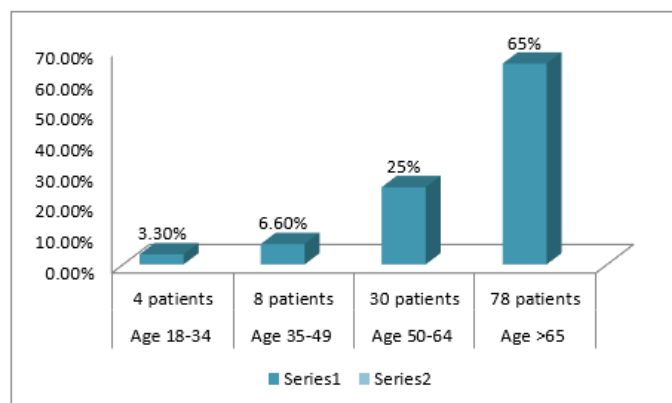


Figure 2. Distribution of patients by age groups.

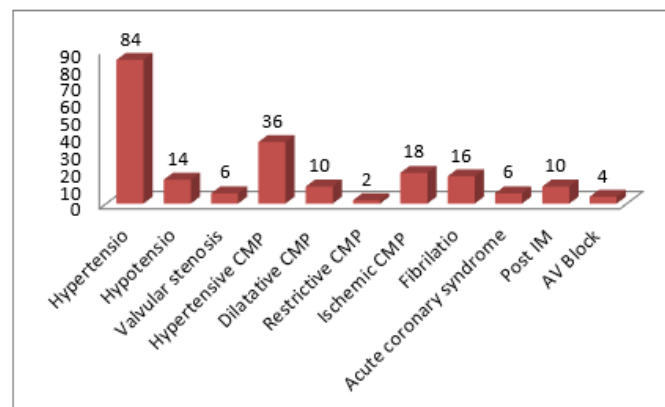


Figure 3. Presentation of heart disease in patients with acute renal impairment (AKI) treated at the Nephrology Clinic at the University Clinical Center of Kosovo (UCCK).

the 120 patients included in the study, 4 were 18-34 years old, 8 were 35-49 years old, 30 were 50-64 years old, and 78 were > 65 years old (Figure 2). The average age of the patients in the study was 67.5 years old.

There is a strong link between cardiorenal syndrome and age. As can be seen in the figure, with increasing age, the frequency of cardiorenal syndrome increases with a higher prevalence in the age group > 65 years (Figure 2).

In this research were analyzed cases with acute renal impairment (AKI) who also had diagnoses of cardiac diseases

such as: hypertrophic cardiomyopathy (CMP), dilated cardiomyopathy, restrictive cardiomyopathy, ischemic cardiomyopathy, mitral valve stenosis, aortic valve stenosis, atrial fibrillation, atrioventricular block (AV), acute coronary syndrome, myocardial infarction (IM), hypertension (Table 1 and Figure 3).

Hypertension is present in about 70% of patients treated with kidney disease in this study. Regarding cardiorenal syndrome and its connection with other diseases in this prospective study, these concomitant diseases have been found as: diabetes mellitus type 2, secondary anemia, hypothyroidism, hyperparathyroidism, pneumonia, sepsis, ascites, mesenteric tumor, hyperkalemia and Covid 19 (Figure 4).

It is worth noting that in addition to the traditional causes of kidney disease, during the period January 2020 to December 2021, patients with chronic kidney disease after infection with the SARS-Cov-2 virus causing the COVID-19 pandemic, exacerbated the disease in need of hospitalization.

The chi-square statistic is 2.8202. The p-value is 0.093084. Not significant at $p < 0.05$. The chi-square statistic with Yates correction is 2.0376. The p-value is 0.153451. Not significant at $p < 0.05$ (Table 2)

Of the 120 patients who participated in this study, 28 of them ended up with lethality, so the mortality was 23.3% (Figure 5).

Cardiorenal syndrome is a term that includes pathophysiological interactions in patients with renal and cardiac dysfunction. In patients with acute heart failure, worsening of renal function is

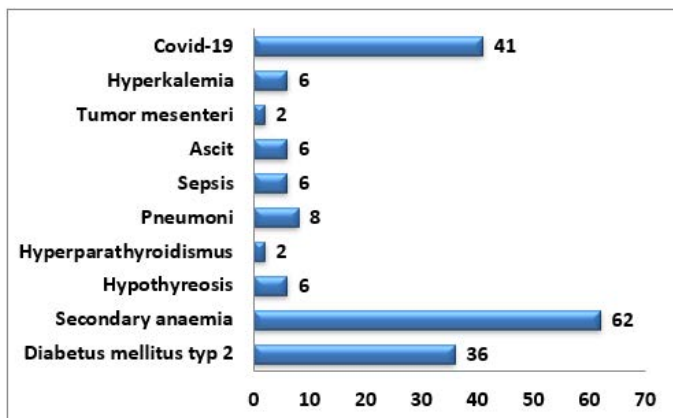


Figure 4. Association of cardiorenal syndrome with concomitant diseases.



Figure 5. Representation of mortality in cardiorenal syndrome.

Table 1. Presentation of cardiac diseases in patients with acute renal impairment (ACI).

CARDIORENAL SYNDROME	
Renal diseases	Cardiac diseases
Acute kidney injury (AKI)	Hypertension, CMP hypertension, post IM, hypotension, atrial fibrillation, acute coronary syndrome.
	Hypertension, dilated CMP, hypertensive CMP, restrictive CMP, mitral valve stenosis, aortic valve stenosis, atrial fibrillation, post IM, ascending aortic dilatation, acute coronary syndrome, AV block.

Table 2. Men/women tabular ratio of patients in the study.

	with COVID-19	without COVID-19	Marginal Row Totals
Male	25 (33.7) [0.9]	49 (66.2) [0.18]	74
Female	16 (34.7) [1.45]	30 (65.3) [0.29]	46
Marginal Column Totals	41	79	120 (Grand Total)

common with an incidence of about 40% of patients. Anemia is present in over 1/3 of cases with CRS, where the triad of heart failure, renal insufficiency, and anemia form cardio-renal-anemia syndrome. Anemia is quite common in patients with CRS and comes mainly as a result of decreased erythropoietin secretion [10].

Compared to a study done in the intensive care unit at Al Ameen Medical College Hospital of India with 100 cases for the period December 2016-June 2018, 74% of patients were men, 26% were women. Regarding the age of the patients, over 30% were aged 51-60 years, with a mean age of 55 years old. Risk factors for developing cardiorenal syndrome include hypertension (75%), type 2 diabetes mellitus (44%), and dyslipidemia (30%).

Anemia was present in 40% of cases. Patients with decompensated acute heart failure developed acute renal failure in 47% of cases. The mortality of patients in this study was 7%. These results are consistent with our research in terms of gender and age. The large number of cases with COVID-19 positive (41 cases) increase mortality in our research, by 23.3%, reasoning with the presence of COVID-19 positive infection [1,6,8].

Conclusion.

Renal impairment is one of the most significant comorbidity in heart failure, where a decrease in GFR is an indicator of complications and cardiovascular mortality. In recent decades, various studies have been conducted against the definition of cardiorenal syndrome, understanding of pathophysiology, the use of new biomarkers that represent a new dimension in the diagnostic algorithm and evaluation of heart failure with impaired renal function, and provides prognostic value for the syndrome cardiorespiratory.

The nature of the lesion in cardiorenal syndrome is quite heterogeneous, as it is sometimes quite difficult to identify between types. Management strategies include discontinuation of nephrotoxic agents (NSAIDs, aminoglycosides, radiocontrast

agents) attempts to maintain euvoemia, diuretics, vasodilators, inotropic drugs, and RRT. COVID-19 positive increase morbidity and mortality of this category of patients.

Ethical statement.

The University of Prishtina's Faculty of Medicine's ethics committee approved this study on 10 May 2022, by the decision letter with number 4434.

Conflict of interest.

Authors declare no conflict of interest.

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