

# Coexistence of Cardiovascular and Renal Diseases

Melissa Cousino\*

Department of Cardiology, National and Kapodistrian University of Athens, Athens, Greece

## Abstract

Cardiorenal multimorbidity, the coexistence of cardiovascular and renal diseases, is a complex and challenging clinical condition frequently encountered in hospitalized cardiology patients. The close relationship between the heart and kidneys makes them susceptible to mutual pathophysiological interactions, leading to an increased risk of adverse outcomes. This essay aims to explore the prevalence, mechanisms, clinical implications, and management strategies for cardiorenal multimorbidity in hospitalized cardiology patients, emphasizing the importance of a multidisciplinary approach to optimize patient outcomes. Cardiorenal multimorbidity is a prevalent condition, particularly in the hospitalized cardiology patient population. The simultaneous presence of heart and kidney disease significantly increases the risk of morbidity and mortality.

**Keywords:** Cardiovascular disease • Therapeutic agents for CVD • Myocardial infarction • Cardiorenal multimorbidity

## Introduction

The prevalence of cardio renal multimorbidity varies depending on the population studied, but it is estimated that up to 30-60% of patients with heart failure have concomitant renal impairment. The mechanisms underlying cardio renal multimorbidity are multifactorial and interdependent. Chronic kidney disease and heart failure often share common risk factors, including hypertension, diabetes mellitus, and atherosclerosis. The progressive decline in renal function can contribute to the development or exacerbation of cardiovascular disease through various pathways, including volume overload, sodium and fluid retention, activation of the renin-angiotensin-aldosterone system, and sympathetic nervous system over activity. Similarly, cardiovascular diseases, such as heart failure, can impair renal perfusion and oxygenation, leading to kidney dysfunction. Achieving euvolemia is crucial to prevent volume overload and congestion in heart failure patients, as well as to maintain renal perfusion. Close monitoring of fluid balance, diuretic therapy optimization, and restriction of dietary sodium intake are important components of fluid management strategies [1].

## Literature Review

The presence of cardio renal multimorbidity in hospitalized cardiology patients is associated with several adverse clinical outcomes, including increased hospitalizations, longer lengths of stay, higher rates of readmission, higher healthcare costs, and higher mortality rates. The coexistence of heart and kidney disease also poses diagnostic and therapeutic challenges, as the management of one condition may directly or indirectly affect the other. Additionally, the presence of renal impairment can influence the pharmacokinetics and pharmacodynamics of medications commonly used in cardiovascular disease management, necessitating dose adjustments and careful monitoring. Risk Factor Modification: Aggressively controlling modifiable risk factors such as hypertension, diabetes, dyslipidemia, and obesity is essential to prevent or slow the progression of both cardiovascular and renal diseases. Lifestyle modifications, including a heart-healthy diet, regular exercise, smoking cessation, and weight management, should be emphasized [2].

**\*Address for Correspondence:** Melissa Cousino, Department of Cardiology, National and Kapodistrian University of Athens, Athens, Greece, E-mail: [Melissacousino9@gmail.com](mailto:Melissacousino9@gmail.com)

**Copyright:** © 2023 Cousino M. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

**Received:** 02 May, 2023, Manuscript No. jicg-23-103896; **Editor assigned:** 03 May, 2023, PreQC No. P-103896; **Reviewed:** 16 May, 2023, QC No. Q-103896; **Revised:** 22 May, 2023, Manuscript No. R-103896; **Published:** 29 May, 2023, DOI: 10.37421/2684-4591.2023.7.185

## Discussion

**Medication Management:** Medications used in the management of cardiovascular disease should be carefully selected, considering their impact on renal function. Dose adjustments may be necessary in patients with renal impairment to avoid drug toxicity or inadequate therapeutic effect. Collaboration between cardiologists and nephrologists is vital in optimizing medication regimens and preventing drug interactions. **Renal Replacement Therapies:** In patients with advanced cardio renal multimorbidity, the need for renal replacement therapy, such as dialysis or kidney transplantation, may arise. The timing and modality of renal replacement therapy should be individualized based on the patient's clinical status and goals of care. Cardio renal multimorbidity refers to the coexistence of cardiovascular disease and chronic kidney disease in an individual. It is a complex and challenging condition frequently encountered in hospitalized cardiology patients. Cardio renal interactions significantly impact patient outcomes, leading to increased morbidity, mortality, and healthcare utilization. This essay aims to explore the prevalence, pathophysiology, clinical implications, and management strategies related to cardio renal multimorbidity in hospitalized cardiology patients [3].

Cardio renal multimorbidity is highly prevalent among individuals with CVD, especially those requiring hospitalization. The simultaneous presence of heart and kidney diseases poses a significant clinical burden and worsens patient outcomes. The pathophysiology underlying cardio renal multimorbidity is multifactorial, involving shared risk factors, hemodynamic disturbances, neurohormonal activation, and systemic inflammation. Shared risk factors, such as hypertension, diabetes mellitus, dyslipidemia, and obesity, contribute to the development of both CVD and CKD. These risk factors promote endothelial dysfunction, oxidative stress, and inflammation, leading to damage in the heart and kidneys. Additionally, the renin-angiotensin-aldosterone system and sympathetic nervous system activation play crucial roles in the pathophysiology of cardio renal multimorbidity. Excessive activation of these systems contributes to vasoconstriction, sodium and water retention, and further organ damage. The presence of cardio renal multimorbidity in hospitalized cardiology patients carries significant clinical implications. It is associated with worse outcomes, including increased morbidity, mortality, prolonged hospital stays, and higher healthcare costs [4].

Cardiorenal multimorbidity is associated with a higher risk of adverse cardiovascular events, such as myocardial infarction, heart failure exacerbation, arrhythmias, and sudden cardiac death. Furthermore, it increases the risk of progressive kidney dysfunction, end-stage renal disease, and the need for renal replacement therapy. **Complex Treatment Strategies:** Managing patients with cardiorenal multimorbidity requires an integrated and individualized approach. The presence of impaired kidney function can influence medication choices, dosing adjustments, and interventions. This complexity necessitates close collaboration between cardiologists, nephrologists, and other healthcare providers to optimize patient care. **Increased Hospitalization and Readmission Rates:** Patients with cardiorenal multimorbidity have higher rates of hospitalization and readmission,

reflecting the complex nature of their conditions [5].

The intertwined pathophysiology and potential treatment challenges often lead to recurrent exacerbations and complications, requiring comprehensive management and follow-up care. The management of cardiorenal multimorbidity in hospitalized cardiology patients involves addressing both cardiovascular and renal aspects of the disease. Achieving target blood pressure levels is crucial in slowing the progression of both CVD and CKD. Renin-angiotensin system inhibitors, including angiotensin-converting enzyme inhibitors or angiotensin receptor blockers are commonly prescribed to manage blood pressure and mitigate the adverse cardio renal effects. Fluid Monitoring and balancing fluid status is essential to prevent volume overload and congestion, which can worsen cardiac and renal function. Individualized fluid restriction, diuretic therapy, and close clinical assessment can help optimize volume status. Considering the altered pharmacokinetics and potential nephrotoxic effects in patients [6].

## Conclusion

Cardio renal multimorbidity refers to the coexistence of cardiovascular disease and chronic kidney disease in individual. This overlapping condition poses significant challenges for healthcare providers and patients alike. Hospitalized cardiology patients often present with both cardiac and renal complications, requiring comprehensive management strategies to optimize outcomes. This essay aims to explore the relationship between cardio renal multimorbidity, its impact on hospitalized cardiology patients, and the approaches employed to address these complex medical conditions. Cardiovascular disease and chronic kidney disease are interrelated conditions, sharing common risk factors and pathophysiological mechanisms. The bidirectional relationship between CVD and CKD contributes to the development and progression of both diseases. Cardio renal multimorbidity is prevalent among hospitalized cardiology patients, as these individuals often have underlying cardiac conditions that may predispose them to kidney dysfunction and vice versa.

## Acknowledgement

None.

## Conflict of Interest

None.

## References

1. Zotov, Aleksandr, Sergei Vachev, Daniil Borisov and Aleksandr Troitskiy, et al. "Thoracoscopic pulmonary vein and left atrial posterior wall isolation combined with left atrial appendage resection in patients with long-standing persistent atrial fibrillation." *Braz J Cardiovasc Surg* 35 (2020): 22-27.
2. Van Laar, Charlotte, G. S. Geuzebroek, Frederik N. Hofman and Bart P. Van Putte. "The totally thoracoscopic left atrial maze procedure for the treatment of atrial fibrillation." *Cardiothoracic Surg* (2016).
3. Harlaar, Niels, Niels J. Verberkmoes, Pepijn H. van der Voort and Serge A. Trines, et al. "Clamping vs. nonclamping thoracoscopic box ablation in long-standing persistent atrial fibrillation." *J Thorac Cardiovasc Surg* 160 (2020): 399-405.
4. Batko, Jakub, Daniel Rams, Grzegorz Filip and Artur Bartoszcze, et al. "Left atrial appendage morphology and course of the circumflex artery: Anatomical implications for left atrial appendage occlusion procedures." *Innovations* 17 (2022): 424-429.
5. Rams, Daniel, Jakub Batko, Krzysztof Bartuś and Grzegorz Filip, et al. "Left internal mammary artery operative topography for midcab and tecab procedures." *Innovations* (2022): 15569845221137578.
6. Li, Xiangyu, Mingfang Li, Yongfeng Shao and Weidong Gu, et al. "Thoracoscopic ablation delays progression from paroxysmal to persistent atrial fibrillation." *J Thorac Cardiovasc Surg* (2021).

**How to cite this article:** Cousino, Melissa. "Coexistence of Cardiovascular and Renal Diseases." *J Interv Gen Cardiol* 7 (2023): 185.