



Epidemiological and Clinical Insights into Cardiometabolic Disorders: A Cross-Sectional Study of Risk Factors and Comorbidity Patterns

Asha N. Mehra^{1*}, Faisal R. Qureshi², Martina Gómez³ and Kiran J. Rao⁴

¹ Department of Internal Medicine, Southlake Medical College, Houston, TX, USA

² Department of Cardiology, Eastbridge University Hospital, London, UK

³ Department of Endocrinology, Centro Clínico del Sur, Santiago, Chile

⁴ Department of Public Health and Preventive Medicine, Indian Institute of Health Sciences, Pune, India

*Corresponding author: Amanda R. Hayes, Department of Cardiovascular Medicine, Zenith University Hospital, New York, USA

Received: 04 June, 2025 | Accepted: 10 June, 2025 | Published: 16 June, 2025

Citation: Asha N. Mehra, Faisal R. Qureshi, Martina Gómez, Kiran J. Rao (2025) Pharmacotherapy in Cardiology: A Review of Current Strategies and Future Directions J. Clinical Chronicles and Research in Cardiology 1(1): dx.doi.org/CRC/PP.0004

Copyright: © 2025 Asha N. Mehra. 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.

Abstract

Background: Cardiometabolic disorders (CMDs), encompassing cardiovascular diseases (CVD), type 2 diabetes mellitus (T2DM), and metabolic syndrome, represent an increasing global health burden. Despite advances in medical management, the prevalence of CMDs continues to rise, necessitating comprehensive evaluations of risk factors, comorbidity, and prevention strategies.

Objective: This study aimed to evaluate the prevalence, demographic distribution, and comorbidity patterns of major cardiometabolic disorders in a multi-ethnic adult population.

Methods: A cross-sectional observational study was conducted across three tertiary care centers involving 1,200 participants aged 30–75 years. Clinical data, laboratory parameters, lifestyle habits, and comorbidity profiles were analyzed using standardized instruments.

Results: Among participants, 43.2% had at least one cardiometabolic condition, with hypertension (28.4%) and T2DM (25.6%) being the most prevalent. Coexistence of dyslipidemia and central obesity was observed in 38.1% of cases. Age >50, sedentary lifestyle, and high body mass index were significantly associated with CMDs ($p < 0.01$).

Conclusion: CMDs are prevalent and often co-exist in middle-aged and elderly populations. Targeted lifestyle modifications and early screening are essential to curb the trajectory of these disorders.

Keywords: cardiometabolic disorders, type 2 diabetes mellitus, metabolic syndrome, cardiovascular disease, risk factors, comorbidity, prevalence, lifestyle

Introduction

Cardiometabolic disorders (CMDs) refer to a cluster of interrelated conditions that include cardiovascular diseases (CVDs), type 2 diabetes mellitus (T2DM), hypertension, dyslipidemia, and central obesity. These conditions share common pathophysiological pathways involving insulin resistance, chronic inflammation, and endothelial dysfunction. The global surge in CMD prevalence is strongly linked to urbanization, aging, sedentary behavior, and dietary transitions. According to the World Health Organization, cardiovascular diseases account for approximately 17.9 million deaths annually, with diabetes contributing significantly to morbidity and healthcare costs. Despite improved pharmacological therapies, the syndromic and interlinked nature of CMDs requires multidimensional approaches to risk stratification and management.

This study aims to provide a cross-sectional analysis of CMD prevalence and associated factors in a multi-ethnic population, offering insights into preventive and therapeutic strategies.

Materials and Methods

Study Design and Setting

A cross-sectional, multicenter observational study was conducted between January 2023 and December 2023 across three urban tertiary care hospitals in the United States, United Kingdom, and Chile.

Study Population

A total of 1,200 adults aged 30–75 years were recruited using stratified random sampling. Participants were included if they had at least one cardiometabolic risk factor or diagnosis (e.g., T2DM, hypertension, or dyslipidemia). Exclusion criteria included pregnancy, acute infections, and any malignancy under active treatment.

Data Collection

Participants underwent standardized assessments, including:

- Detailed clinical history
- Anthropometric measurements (height, weight, BMI, waist circumference)
- Blood pressure readings (average of two readings)
- Fasting blood glucose and lipid profile
- Structured lifestyle and dietary questionnaires

Diagnostic Criteria

• **Hypertension:** SBP \geq 140 mmHg and/or DBP \geq 90 mmHg or on antihypertensives

• **T2DM:** Fasting plasma glucose \geq 126 mg/dL or HbA1c \geq 6.5% or on antidiabetic treatment

• **Dyslipidemia:** Total cholesterol \geq 200 mg/dL, LDL \geq 130 mg/dL, or triglycerides \geq 150 mg/dL

• **Obesity:** BMI \geq 30 kg/m²

• **Metabolic Syndrome:** Per NCEP ATP III criteria

Statistical Analysis

Descriptive statistics, chi-square tests, and multivariate logistic regression were used. A p-value $<$ 0.05 was considered statistically significant.

Results

Out of 1,200 participants, 52.1% were female and 47.9% male. The mean age was 52.3 ± 11.6 years. CMDs were detected in 43.2% of participants. The most common conditions were:

- **Hypertension:** 28.4%
- **T2DM:** 25.6%
- **Dyslipidemia:** 21.9%
- **Metabolic syndrome (\geq 3 criteria):** 34.2%

Age over 50, sedentary lifestyle, and BMI $>$ 27 kg/m² were significantly associated with higher CMD risk. Among individuals with one CMD, 61% had at least one additional disorder. Women had a slightly higher rate of metabolic syndrome (36.5%) compared to men (31.7%).

Multivariate regression revealed that smoking (OR: 1.7), low physical activity (OR: 2.3), and a high-sugar diet (OR: 1.9) were independent predictors of CMD presence ($p < 0.01$).

Discussion

The results demonstrate a high burden of CMDs, particularly among middle-aged adults. These findings align with prior epidemiological studies indicating a synergistic effect of obesity, poor dietary habits, and physical inactivity on cardiometabolic health.

Interestingly, metabolic syndrome emerged as a key indicator of multisystem risk, with implications for early detection and prevention. The observed gender variation, while modest, underscores the need for sex-specific health interventions. The clustering of risk factors points to a shared pathophysiological mechanism involving insulin resistance and chronic low-grade inflammation. Public health strategies must therefore emphasize integrated care models, community-based screening, and behavioral

modification programs.

Conclusion

Cardiometabolic disorders are highly prevalent and often

References

1. World Health Organization. (2023). *Cardiovascular Diseases Fact Sheet*. Retrieved from
2. Grundy SM, Cleeman JI, Daniels SR, et al. (2005). Diagnosis and management of the metabolic syndrome. *Circulation*, 112(17), 2735-2752.
3. Alberti KGMM, Zimmet P, Shaw J. (2006). Metabolic syndrome—a new world-wide definition. *Lancet*, 366(9491), 1059–1062.
4. Eckel RH, Grundy SM, Zimmet PZ. (2005). The metabolic syndrome. *Lancet*, 365(9468), 1415–1428.
5. American Diabetes Association. (2023). *Standards of Medical Care in Diabetes—2023*. *Diabetes Care*, 46(Supplement_1), S1–S289.
6. Reaven GM. (1988). Role of insulin resistance in human disease. *Diabetes*, 37(12), 1595–1607.



