Future Research Directions for Multimorbidity Involving Cardiovascular Diseases

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KEYWORDS

• Multimorbidity • Aging • Chronic disease • Multiple morbidities

KEY POINTS

- A research agenda focused on cardiovascular disease (CVD) in the context of multimorbidity (2 or more chronic conditions) can address broad scientific issues that are important to the populace.
- Systematic understanding of the molecular mechanisms underlying complex and potentially interacting chronic diseases can be developed to improve strategies for treatment and prevention.
- Clinical trials should ascertain comorbid disease, enroll multimorbid persons to study applicable interventions, and examine patient-centered outcomes relevant to health benefits and harms.
- By eliciting and addressing patient goals of care, the treatment of complex patients with cardiovascular and other chronic illnesses can optimize person-centered outcomes.
- Guideline development must systematically approach the most common and salient disease combinations and, in the case of an absence of evidence, outline high-priority research questions.

INTRODUCTION

Multimorbidity, or multiple chronic conditions (MCCs), is defined as the coexistence of 2 or more chronic conditions and has been observed in approximately two-thirds of older adults in many population studies, making it the "most common chronic condition."[1] Although MCCs lacks a standardized definition in some respects, considerable research has been published demonstrating its substantial human burden in terms of symptoms, medications, treatment costs, and quality of life.[2] Multimorbidity is increasing faster than any single disease and is increasing across all age groups.[3]

Disclosure Statement: The author has nothing to disclose. The views expressed in this article do not necessarily reflect the view of the National Institutes of Health, Department of Health and Human Services, or the United States government.
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Clin Geriatr Med 32 (2016) 399–407
http://dx.doi.org/10.1016/j.cger.2016.01.008 **geriatric.theclinics.com**
0749-0690/16/$ – see front matter Published by Elsevier Inc.

No core list of chronic conditions has been widely accepted to define MCCs; however, most population-based studies of the topic are dominated by persons with hypertension, hyperlipidemia, coronary artery disease, and other CVDs. This article advances a set of future research directions for multimorbidity involving CVDs, using an interdisciplinary patient-centered (not disease-centered) approach, with the intent of moving the field forward by translating evidence into policy and practice.

Geriatricians and general internists have previously developed research agendas related to multimorbidity in an effort to broaden the focus from single diseases or organ systems.[4–6] Subsequently, the Department of Health and Human Services released *Multiple Chronic Conditions: A Strategic Framework* in 2010. Although a major focus has been on the strategic framework's Goal 4, "Facilitate research to fill knowledge gaps about, and interventions and systems to benefit, individuals with MCC," substantial work has addressed the other goals: (1) foster health system change, (2) empower individuals, and (3) equip clinicians.[6] In the spirit of a cycle approach to health from staying healthy to treating conditions to reducing pain and suffering, this article approaches the research on CVDs but from a patient-centered multimorbidity perspective. With this broad scope, it must be recognized that any set of research directions is subjective and not definitive. Available sources that were examined include prior published research agendas, recent meetings, and grant portfolio analyses. A research agenda focused on CVDs in the context of multimorbidity can address broad scientific issues that are important to the populace.

FRAMEWORK FOR MULTIMORBIDITY AND CARDIOVASCULAR DISEASES

This article uses the prominent frameworks for multimorbidity. Although some studies of multimorbidity have analyzed several diseases and conditions at once, other studies have evaluated interactions between just 2 or 3 conditions (dyads and triads), for example, hypertension and diabetes. Another approach is the comorbidity paradigm, where research focuses on an index condition and its coexisting conditions (eg, comorbidities of coronary artery disease).[7] Among comorbid conditions, concordant conditions have similar underlying pathophysiology and may be more the focus of the same disease management plans; for example, diabetes is considered concordant with hypertension, coronary artery disease, and peripheral vascular disease.[8] Atherosclerotic vascular disease is another salient example, which manifests in the body systems as cerebrovascular, cardiovascular, and peripheral artery diseases, although they commonly co-occur. Conversely, discordant conditions are not directly related in either pathology or management, such as discordance of coronary artery disease with low back pain, prostate cancer, and arthritis. Another important concept among the multimorbid conditions is that one condition may be clinically dominant, such as an end-stage disease, or one severely symptomatic, such as class IV congestive heart failure. Finally, some research uses the true multimorbidity approach, where the diseases are considered equally without ranking, and the focus is the impact on the patient.

The frameworks themselves raise several researchable questions. Although a widely accepted definition of multimorbidity is 2 or more chronic conditions, this could achieve wider consensus, and alternatives, such as 3 or more conditions, could be examined and rejected. Which conditions should be included on a universal list of chronic conditions? Should obesity, hyperlipidemia, urinary incontinence, and other geriatric syndromes (cognitive impairment, and delirium) be on that list?[2] How should atherosclerosis be included? Should CVDs be grouped with stroke? How should the framework for research on combinations of CVDs and MCCs be optimized? Which dyads and triads including CVDs are most in need of new research?