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Why Cardiovascular Disease Is the Number One Killer in the United States

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Abstract

During the last two decades, mortality from cardiovascular disease temporarily declined but then rose again to epidemic proportions. The reasons for this progressive increase are multiple, but none are insurmountable. At the forefront of this challenge is the medical/industrial complex that requires billions of dollars per year to maintain the status quo. Next are treatment guidelines that focus on cardiovascular risk instead of disease eradication. Furthermore, poor lifestyle choices are prevalent in society, often encouraged by labor saving devices and avoidance of adequate exercise and stress reduction. Added to these difficulties is the inadequate training for cardiovascular disease prevention of medical providers by educational institutions. Much of this deficiency is the delayed dispersion of new medical knowledge to the educators and providers. Also challenging is the widespread availability of fast food promulgated by industries and resulting in diabetes and obesity. Finally, identification of subclinical cardiovascular disease in individuals who should be treated before a cardiovascular event occurs has only recently been proven possible with non-invasive calcium heart scanning. What is needed at this time is the determination by society to overcome these barriers to cardiovascular disease prevention and to reduce cardiovascular deaths to a minor disease status.

Keywords

Medical/Industrial Complex, Cardiovascular Disease, Lifestyle, Heart Disease, Information Barrier

1. Introduction

For the last two decades, major changes in the rate of cardiovascular disease have been observed. Up to 2018, a major decline in cardiovascular disease occurred related to the decrease in smoking in the US. Unfortunately, since 2018, this de-

cline has leveled off and is now on the increase, as obesity (with its associated diabetes and hypertension) is afflicting much of the US population. According to the American Heart Association's 2025 statistical report, in 2022 (the most recent year for which final data are available), the overall number of cardiovascular disease (CVD) related deaths in the U.S. was 941,652, an increase of more than 10,000 from the 931,578 CVD deaths in 2021 [1]. During this same period, new discoveries have resulted in a much better understanding of the prevention of cardiovascular disease. Why this information has not reached the health care providers is complex and unfortunate as detailed in this article.

2. The Delay in Applying Medical Knowledge

Cardiovascular disease remains the number one cause of mortality in the United States. During the last decade, major advances in understanding its pathophysiology and treatment have occurred. It is now understood how coronary artery obstruction occurs and what needs to be done to prevent it [2]-[4]. Diagnosis and prevention are non-invasive, inexpensive, and readily available to all physicians and their patients [5] [6]. Unfortunately, this information rarely reaches the providers who could apply this knowledge to their patients. Traditionally, for most major medical advances, 12 to 17 years are required to transmit information from the research arena to physicians and nurse practitioners [7] [8]. Unfortunately, many people will suffer from cardiovascular disease during this lengthy interim period. In addition, the costs of this disease when it becomes symptomatic are staggering and will continue to rise [9] [10]. The reasons that knowledge of cardiovascular disease prevention requires such a prolonged time to be initiated are complex as described below. None are insurmountable if the medical establishment makes it a high enough priority to resolve these barriers (**Figure 1**).

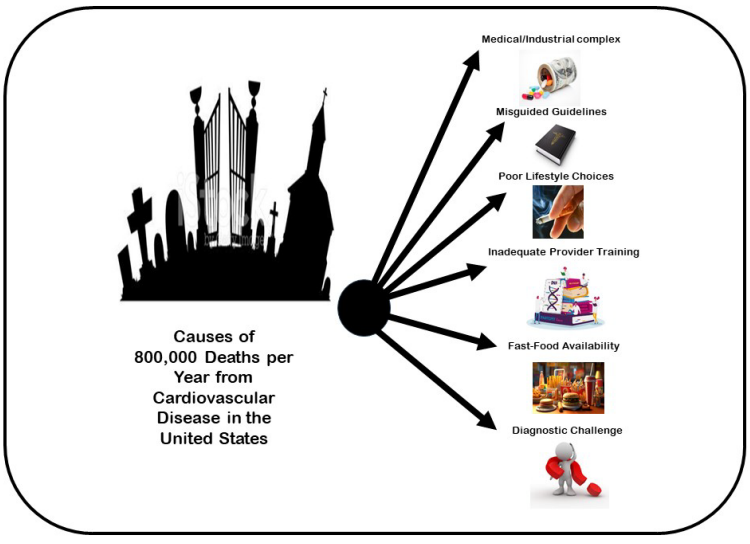

Figure 1. The societal causes of cardiovascular disease deaths are complex and multifactorial. However, addressing each one with legal, moral, educational, and financial reasoning can provide beneficial results similar to addressing smoking cessation several years ago.

3. The Medical/Industrial Complex

In 1961, President Dwight D. Eisenhower warned the nation about the "military-industrial complex" in his farewell address [11]. He cautioned against the potential influence of this powerful complex, which he described as the union of the military establishment and the arms industry dictating funding to the United States government and society. A similar challenge can be made for the "Medical/Industrial Complex" that costs the American citizen over 750 billion dollars per year for cardiovascular disease and will exceed almost a trillion dollars per year by 2030 [10]. The term "medical-industrial complex" was popularized in the 1980s by Arnold Relman, editor of the New England Journal of Medicine, to describe the growing influence of for-profit entities in healthcare [12] [13]. The major part of this expenditure is applied to the treatment of cardiovascular disease, not to its prevention. These dollars support medical institutions, manufacturers of medical products, hospital services, medical insurance companies, Medicare and Medicaid administration, and salaries of thousands of individuals involved with cardiovascular care. If cardiovascular disease were prevented, it would result in the savings of billions of dollars that could benefit other areas of disease prevention in our society. Therefore, maintaining the status quo of "treatment over prevention" may be in the interest of the "Medical/Industrial Complex" but not the patient nor society. This approach, held by many members of the Medical/Industrial complex, is often called the "status quo bias" [14] [15].

4. Misguided Guidelines

Medical guidelines serve a very important purpose in providing direction to caregivers who may not be familiar with appropriate medical therapy. Most guidelines use a rating system that indicates the strength of the recommendations based on the studies available and the scientific methods utilized to support the conclusions. However, there are major drawbacks to guidelines, including how current they are with new scientific advances, what their intended treatment goals are, and the expertise of the individuals constructing the guidelines [15] [16]. Guidelines are also influenced by the biases of the panel members writing the guidelines. These are the reasons that the 19 organizations that publish cardiovascular disease guidelines rarely agree on treatment recommendations [17]. Unfortunately, most cardiovascular guidelines recommend outdated approaches to atherosclerosis prevention, especially non-achievable lifestyle changes and insufficient reduction of LDL cholesterol [18].

5. Poor Lifestyle Choices

All recommendations for preventing atherosclerosis recommend improved lifestyle changes that include increased exercise and a caloric input focused on obtaining a normal body weight. In fact, the Federal government in partnership with several cardiovascular organizations has spent millions of dollars to convince the American public to eat healthy foods, control risk factors, and increase exercise.

This Million Hearts Model program's goal was to reduce heart attacks and strokes by 7% over a 5-year period (2017 to 2021). Under this model, the US centers for Medicare and Medicaid Services paid participating health care organizations to asses and reduce CVD risk among Medicare beneficiaries age 40 to 79 years. Unfortunately, the results were disappointing. The absolute reduction in heart attacks and strokes was only 0.3% [19] [20]. Even if it were 100% successful by preventing cardiovascular disease by 7%, in preventing CVD events, it would still not prevent millions of heart attacks and strokes occurring in the United States during this 5-year period. Other limited treatment programs have shown some immediate benefits to cardiovascular health. However, these positive results ignore the patients' high dropout rate in these studies, the fact that the studies are all relatively short term, and that the individuals who volunteer for these studies are often rewarded in various ways for their participation. As far back as 1973, Kelly West published a review demonstrating that this approach was not successful in the majority of individuals [21]. Pursuing this approach is only marginally successful in a society with innumerable food choices, extensive advertising by the food industry, and the availability of many labor-saving devices. In other words, the social determinants of health and lifestyle components are associated with dietary patterns in any population [22]. What is specifically needed is education on the quantity of cholesterol in foods and a meal plan to reduce cholesterol intake to <200 mg/day [23].

6. Inadequate Provider Training

The current medical knowledge base is immense and a challenge for providers to understand only a small portion of what is needed for treatment in our modern society. Unfortunately, prevention of cardiovascular disease is not emphasized in many training programs. The prevention of atherosclerosis by non-invasive methodology has only been realizable in the last decade and its inclusion is inadequate in most training programs. In addition, the teachers in most educational programs are not aware of the newest approaches on prevention and lifestyle management [24]. Particularly in rural areas in the United States, education of caregivers, be it nurse practitioners, physicians, or pharmacist clinicians, needs to be urgently addressed to directly relate to atherosclerosis prevention.

7. Fast Food Availability

Many organizations have stated that fast food restaurants are to blame for both obesity and heart disease [25]. Although this assignment has merit, the society in which we live permits the selling of various foodstuffs unless direct harm can be attributed to it. Since American citizens want the choice of foods to be left to the consumer, placing blame on certain types of restaurants will not resolve the epidemic of atherosclerosis. Many foods that contain high levels of cholesterol are in fact, totally acceptable to the American public including eggs, cheese, and other dairy products [26]. At least in the foreseeable future, drastically recommending

changing the American diet through recommendations and guidelines will not be a successful approach to significantly reducing heart disease.

8. The Diagnostic Challenge

The principal problem with deciding whom to treat to prevent an atherosclerotic event in an asymptomatic person has been difficult to resolve for many years [27]. For many individuals, there are no clinical signs nor symptoms prior to a cardiovascular event that would indicate an abnormality in the cardiovascular system. In fact, many individuals with no major risk factors and normal LDL cholesterol have asymptomatic atherosclerosis by age 50 years [28]. This observation makes it difficult to identify individuals at risk by history and laboratory assessment alone. Various algorithms of risk factor assessments may be helpful but are insufficiently sensitive to avoid treating many individuals without subclinical cardiovascular disease. Non-invasive tests such as stress echocardiograms or electrocardiograms are too insensitive or too non-specific to provide support for definitive therapy in the asymptomatic patient. Invasive testing including coronary artery angiograms are too expensive, require extensive expertise, or have unacceptable hazards in asymptomatic individuals to be practical. This conundrum changed when coronary artery calcium scoring was shown to be an excellent, non-invasive, inexpensive approach to identifying atherosclerosis [29] [30]. Although it was shown to be an excellent predictor of future atherosclerotic events [31], many cardiologists and cardiovascular organizations negated its importance, citing the lack of randomized controlled trials [32]. This position was held in spite of the fact that several accepted cardiovascular tests (e.g., the electrocardiogram and stress echocardiogram) are routinely recommended and used by physicians throughout the United States without controlled clinical trials proving efficacy. However, a recent study in which all patients underwent CAC testing and only half of them were informed of the result was completed. This study confirmed that individuals who knew their calcium score had a significantly reduced cardiovascular event rate compared to those individuals who were not informed concerning their calcium score result [33].

9. Summary

Atherosclerosis leading to serious health consequences and death remains an epidemic in the United States, not because an effective preventative treatment is not available but because of multi-factorial obstacles in our society. Of all of the barriers listed above, the most serious is the resistance of the Medical/Industrial Complex to change. Understandably, this change is not easy. Medical history is replete with outmoded treatments that have taken years to correct, such as bleeding a sick individual to remove "bad humors." There is no doubt that change will eventually occur, and prevention of atherosclerosis will become the norm. The only questions are how long it will take, how many lives will be needlessly lost, and how many resources will be wasted in the meantime.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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