

A Few Unpleasant Facts About Atherosclerotic Arterial Disease in the United States and the World

Heart disease continues to be the number one cause of death for both men and women in the United States. The majority of these patients die as a result of atherosclerosis involving the heart and cardiovascular system. Atherosclerosis is a disease that is associated with living in a modern, industrialized nation. When countries such as China rapidly acquire this lifestyle, the incidence of atherosclerotic vascular disease increases strikingly. In the year 2002, approximately 700,000 individuals in the United States (29% of all deaths in the United States) died of heart disease.¹⁻³ The projected cost for the immense burden of heart disease in the United States during 2006 was between \$143 and \$258 billion for health care services, medications, and lost productivity.^{4,5} Arteriosclerotic cardiovascular disease is now the most common cause of death in the entire world.

Not surprisingly, risk factors for the development of atherosclerotic disease are widespread in the United States and in other resource-rich, technically advanced countries. Indeed, between the years 1999 and 2000, approximately 30% of Americans aged 20 years or more were diagnosed with hypertension or were taking antihypertensive medications; 17% had high blood cholesterol, 6.5% were diabetic, 30.5% were obese, and more than 21% smoked cigarettes. Unfortunately, more than 37% reported no leisure-time physical activity.² In 2003, approximately 37% of American manifested 2 or more risk factors for atherosclerotic cardiovascular disease with obesity and diabetes on the rise. Of the approximately 700,000 heart disease deaths in 2002, approximately 500,000 were the result of ischemic coronary heart disease, with approximately half of these individuals dying before emergency services or transport to a hospital could occur. For many of these sudden death cases, their death was the first indication of the presence of coronary heart disease.⁶

WHEN DOES ATHEROSCLEROSIS BEGIN?

Subclinical and unsuspected coronary atherosclerosis is often present in young children with coronary risk factors.¹¹⁻¹⁴ Autopsy studies in children dying of noncardiac causes have

shown that the arterial atherosclerotic process is initiated in childhood with the development of fatty streaks that progress to fibrous plaques.⁷⁻¹⁰ These lesions occur 20 years or more before clinically manifest coronary artery disease is detected. Coronary risk factors such as hyperlipidemia, obesity, and hypertension are common among children in North American and Europe.¹²⁻¹⁵ For example, data from the Bogalusa Heart Study demonstrated that the presence of fatty streaks in autopsied children correlated positively with the presence of elevated blood levels of low-density lipoprotein cholesterol.^{12,15} Thus, the arterial atherosclerotic process begins in childhood as a result of the presence of coronary risk factors, with the disease process progressing into adult life, at which time clinically evident coronary heart disease becomes manifest. The lifetime risk for developing clinically manifest coronary disease (angina pectoris, myocardial infarction, coronary insufficiency, or death from coronary heart disease) at age 40 years is approximately 50% for men and 32% for women.^{16,17}

THE ECONOMIC IMPLICATIONS OF CORONARY ARTERY DISEASE IN THE UNITED STATES

The economic impact of atherosclerosis and ischemic heart disease in the United States is staggering. Between 1979 and 2005, the number of inpatient discharges secondary to cardiovascular disease increased by 26%.¹⁸⁻²¹ During 2005, there were more than 81 million outpatient and more than 4 million emergency department visits by Americans with a primary diagnosis of cardiovascular disease. In addition, approximately 1 in 6 acute hospital stays were the result of cardiovascular disease, at a cost of \$71.2 billion. This amount of money represents approximately one fourth of the total hospital costs in the United States for that year. Coronary atherosclerosis itself led to 1.2 million hospital admissions at a cost of more than \$44 billion. During 2008, loss of work and other associated costs of cardiovascular disease added additional costs of \$448.5 billion.

POTENTIAL BENEFITS OF IDENTIFYING CORONARY HEART DISEASE EARLY

Given the early age for the initiation of the atherosclerotic process and the huge economic burden on the United States of the atherosclerotic disease process, as well as the wide-

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spread existence of atherosclerotic risk factors, it is mandatory that widely disseminated and aggressive public health measures be instituted to reduce the burden on our society imposed by atherosclerotic disease. Many primary and secondary lifestyle and medical interventions have been conclusively demonstrated to prevent or ameliorate the devastating effects of atherosclerosis.

It seems clear to this observer that the time is now ripe for earlier and more aggressive use of such effective measures to lessen the burden of atherosclerotic disease in the United States. Please support the American Heart Association, the American College of Cardiology, the American Diabetes Association, and other local and national programs that seek to ameliorate this devastating burden of disease. As always, I look forward to hearing your responses to this editorial on our blog at <http://amjmed.blogspot.com>.

Joseph S. Alpert, MD
Professor of Medicine
University of Arizona College of Medicine
Tucson
Editor-in-Chief
The American Journal of Medicine

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