Elevated risk factors linked to major cardiovascular disease events across a lifetime

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In one of the largest-ever analyses of lifetime risks for cardiovascular disease (CVD), researchers have found that middle-aged adults who have one or more elevated traditional risk factors for CVD, such as high blood pressure, have a substantially greater chance of having a major CVD event, such as heart attack or stroke, during their remaining lifetime than people with optimal levels of risk factors. This National Institutes of Health-supported study used health data from 257,384 people and was the first to look simultaneously at multiple risk factors for CVD across age, sex, race, and birth generation.

The paper will be published in the January 26 issue of the New England Journal of Medicine.

"This paper adds to the substantial body of evidence that modifiable cardiovascular disease risk factors in healthy men and women heavily influence the likelihood of developing cardiovascular disease later in life, regardless of their backgrounds," said Susan B. Shurin, M.D., acting director of the NIH's National Heart, Lung, and Blood Institute.

"Prevention of cardiovascular disease is a lifetime opportunity for and a responsibility of individuals, families, communities, and the health care system. This paper reinforces that cardiovascular disease can be prevented and controlled throughout the course of an adult's lifetime," she added.

As part of the Cardiovascular Lifetime Risk Pooling Project, investigators analyzed 50 years of data from 18 existing cohort, or population-based, studies in the United States. The investigators pooled the data from the 18 cohorts and measured traditional CVD risk factors – including high blood pressure, high cholesterol levels, diabetes, and smoking status – in men and women from both black and white populations at ages 45, 55, 65, and 75 years.

Men who were 55 years old with at least two major risk factors were six times as likely to die from CVD by age 80 as were men with none or one CVD risk factor (29.6 percent vs. 4.7 percent). Women with at least two major risk factors were three times as likely to die from CVD as were women with no or one CVD risk factor (20.5 percent vs. 6.4 percent).

When all CVD events – fatal and non-fatal – were considered, the results were even more striking. Forty-five-year-old men with two or more risk factors had a 49.5 percent chance of having a major CVD event through age 80, while 45-year-old women had a 30.7 percent chance. On the other hand, men with optimal risk factor levels only had a 1.4 percent chance of having a major CVD event, while women had a 4.1 percent chance of having a major CVD event through age 80.

The results from each individual study were consistent with one another and with those of the pooled group, and showed that traditional risk factors predicted a person's long-term development of CVD more than age. All of the risk factors appeared to carry the same levels of risk as they did 20, 30, or 40 years ago. While black Americans had a higher prevalence of CVD risk factors than white Americans, their lifetime risks were similar when their risk factor profiles were similar.

"In general, previous studies have only looked at CVD risk factors across one specific age or gender in white populations," said Donald M. Lloyd-Jones, M.D., principal investigator of the study and an associate

professor and chair of the Department of Preventive Medicine at Northwestern University Feinberg School of Medicine in Chicago. "We analyzed an enormous pool of available data, which allowed for a more precise estimate of lifetime CVD risks across the age, sex, race, and risk factor spectrum."

Lloyd-Jones added, "These data have important implications for prevention. We need to get more serious about promoting healthy lifestyles in children and young adults, since even mild elevations in risk factors by middle age seem to have profound effects on the remaining lifetime risks for CVD."

The NHLBI supported several of the cohort studies involved, including the Atherosclerosis Risk in Communities Study, Cardiovascular Heart Study, Framingham Heart Study, Framingham Offspring Study, Honolulu Heart Program, Puerto Rico Heart Health Program, and Women's Health Initiative.

"This paper illustrates the power of pooling data from epidemiological studies," said Michael Lauer, M.D., director of the NHLBI's Division of Cardiovascular Sciences. "Because of the U.S. government's investments in these studies, it was possible for the investigators to gather and analyze data on over a quarter of a million people, which could lead to substantial public health and clinical practice implications."

"It is important for adults to know their blood pressure and cholesterol numbers and whether they are at risk for diabetes and also to understand the different approaches they can take to prevent or control their risks for CVD. As American Heart Month approaches in February, this paper underscores the importance of raising awareness of heart disease and coronary heart disease – the most common type of heart disease and the number one killer of both men and women in the United States," said Lloyd-Jones and Shurin.

In an effort to help people reduce their risks of cardiovascular disease, the Centers for Disease Control and Prevention and the Centers for Medicare and Medicaid Services recently launched the Million Hearts Campaign, a national initiative to prevent 1 million heart attacks and strokes over the next five years.

Also, in December 2010, in an effort to promote healthy behaviors and prevent diseases, including cardiovascular disease, the U.S. Department of Health and Human Services launched Healthy People 2020. Healthy People 2020 and its specific, measurable health objectives represent the nation's disease prevention and health promotion goals for the coming decade.

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