HIGH CHOLESTEROL AND MORTALITY IN OLDER PATIENTS

Clinical question. Is the total serum cholesterol value, the high-density lipoprotein cholesterol (HDL-C) value, or the ratio between the two associated with survival or hospitalization for coronary heart disease in men or women over the age of 70?

Background. Because heart disease is the leading cause of death in the United States, the National Cholesterol Education Program has aggressively promoted cholesterol testing to all segments of the US adult population during the last 5 years. All family physicians have probably had elderly patients ask for a cholesterol test as part of their annual physical examination, and many family physicians may believe that cholesterol testing and treatment are important components of preventive medicine. However, there is little evidence to suggest that high cholesterol levels in *elderly* patients are a risk factor for coronary artery disease, heart attacks, or death.

Population studied. Subjects were part of a longitudinal cohort of 2812 noninstitutionalized, community-based elderly men and women living in New Haven, Connecticut in 1982. In 1988, 1617 members of the cohort were recontacted and asked for a blood sample. The 997 who agreed to have a blood sample drawn (35% of original cohort) constituted the final cohort used for analysis. Data on this final cohort are reported for 4 years of follow-up, from 1988 to 1992.

Study design and validity. Drawn from a community-based cohort study, this research has many positive features. There was little loss to follow-up (<1%), and important variables of interest were collected, including level of education, tobacco use, body mass index, and history of hypertension, diabetes mellitus, and myocardial infarction, if any. All deaths were verified by examination of death certificates, and hospitalizations for myocardial events were assessed by monitoring hospitals on a weekly basis. Diagnoses of myocardial events were confirmed by chart review. Multivariate analyses examined the independent effects of cholesterol values on the outcome events to determine if there was any association between having a lower cholesterol value in 1988 and experiencing fewer outcome events by 1992.

A weakness of the study is that only 62% of eligible patients actually participated (997/1617), primarily because of refusal to have a blood sample drawn. However, the 4-year rates of outcome events were not different between participants and nonparticipants. Another drawback to the study is that since the cohort has been followed for only 4 years, there may have been an insufficient number of outcome events to be able to detect a true difference between high- and low-cholesterol groups. A calculation shows that the sample size in this study was sufficient to detect an absolute difference of 9% in the number of myocardial events between high and low cholesterol groups, ie, 40% vs 31%. Thus, a difference of less than 9% would not have been detected by this study, even if some physicians may consider it clinically significant.

Outcomes measured. Primary outcome measures included all-cause mortality, coronary heart disease mortality, and hospitalization for unstable angina or myocardial infarction.

Results. Of the 997 subjects, 16% of the men and 34% of women had a cholesterol level greater than 240 mg/dL at baseline in 1988. The mean age of the cohort was 79 years. There was no association between total cholesterol levels and the incidence of myocardial infarction, unstable angina, coronary heart disease mortality, or all-cause mortality.

Recommendations for clinical practice. One of every four people in this trial was theoretically at risk for an adverse event associated with an elevated cholesterol level. However, no such excess risk was seen. This finding suggests that physicians who routinely obtain cholesterol levels for asymptomatic individuals over the age of 70 risk unnecessarily labeling something as a "medical problem" that is likely benign. Such testing and labeling also add significant costs to the health care system. This study does not address the assessment and management of cholesterol values for patients who are younger than age 70, or for those who are older than age 70 with signs or symptoms of coronary heart disease. However, physicians can safely tell asymptomatic patients over the age of 70 that elevated cholesterol values appear to have little relationship to poor health in individuals in their age group.

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