Socioeconomic Status in Childhood Affects Risk for CHD

Kittleson MM, Meoni LA, Wang NY, et al. Association of childhood socioeconomic status with subsequent coronary heart disease in physicians. Arch Intern Med 2006;166:2356–61.

Study Overview

Objective. To determine whether low childhood socioeconomic status (SES) is associated with increased risk of coronary heart disease (CHD) in adults who have achieved high SES.

Design. Prospective cohort study.

Setting and participants. Participants were men who graduated from the Johns Hopkins University School of Medicine between 1948 and 1964 and were enrolled in the Johns Hopkins Precursors Study. Participants provided a detailed medical history and underwent a physical examination before graduating from medical school, and follow-up was performed using annual mailed questionnaires. Childhood SES was determined based on the occupation of the participant's father.

Main outcome measures. The primary outcome measure was incidence of CHD by age 50 years. Secondary outcomes included CHD occurring at any age, CHD mortality, and all-cause mortality.

Main results. Of 1131 study participants, 216 (19.1%) were from low SES families. Low childhood SES was associated with a 2.40-fold increased risk of developing CHD by age 50 years (95% confidence interval, 1.21–4.74); however, the slightly higher CHD rate was not statistically significant by age 70. The impact of low SES on early CHD persisted after adjusting for other CHD risk factors, including body mass index, cholesterol level, amount of exercise, depression, coffee drinking, smoking, hypertension, diabetes mellitus, and parental history of CHD. Compared with high childhood SES, low childhood SES showed a trend toward increased CHD mortality (hazard ratio, 2.0 [95% confidence interval, 0.99–3.90]); however, low childhood SES was not associated with all-cause mortality.

Conclusion. Low childhood SES is a risk factor for CHD in men aged ≤ 50 years.

Commentary

CHD remains the primary cause of death in the United States [1]. Although many risk factors for CHD have been identified, including advancing age, tobacco use, hypertension, cholesterol, diabetes, depression, and low SES, these factors have only modest capability of predicting which patients will develop or die from CHD. Finding novel risk factors is important because they can help delineate the pathophysiology of CHD and help identify patients who might need more aggressive screening and treatment.

Previous studies have shown that SES (a person's education and income) has a strong effect on the likelihood of developing and eventually dying from CHD [2]. However, given that childhood SES closely predicts adulthood SES, it has been difficult to determine whether both are independent risk factors for CHD. By studying graduates of Johns Hopkins University School of Medicine, Kittleson et al

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theorize that adulthood SES is comparable among all study participants, and therefore, childhood SES can be examined in isolation to determine if it is an independent predictor of CHD. This novel cohort is a relatively homogeneous group of men who were well-educated with at least above-average income. Results suggested that participants with low childhood SES had an increased CHD risk by age 50, but this risk did not appear to remain later in life.

Several shortcomings of the study limit the interpretation of the findings. First, the relatively small number of participants with low childhood SES limits the power of the study. The authors found large differences in CHD and mortality rates at all ages between the 2 groups, but many of the differences did not reach statistical significance. Therefore, it is likely that the differences in CHD rates seen at age 50 persist with increasing age. Second, the authors assumed that all participants had achieved high SES as adults. While this might be true, it is possible that those of low childhood SES had more medical school debt or had lower incomes than participants with high childhood SES. These differences in adulthood might also impact the risk for developing CHD. Finally, the major limitation of the study is the generalizability of the findings. By limiting data to white men who were graduates of Johns Hopkins University School of Medicine, the study sheds little light on whether the same results would be found among minorities, women, or other groups.

Applications for Clinical Practice

Childhood SES is a possible risk factor for CHD. The current application of this study in clinical medicine is somewhat limited by the narrow demographics of the patient population studied. Although questions about childhood SES are unlikely to become a part of the history, the results suggest that childhood SES may be an important factor when assessing a patient's risk for CHD.

—Review by Ashish K. Jha, MD, MPH

References

1. Anderson RN, Smith BL. Deaths: leading causes for 2002. Natl Vital Stat Rep 2005;53:1–89.
2. Kaplan GA, Keil JE. Socioeconomic factors and cardiovascular disease: a review of the literature. Circulation 1993;88 (4 Pt 1):1973–98.