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Wife's Level of Education and Husband's Risk of Primary Cardiac Arrest

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Abstract: Data from a case-control study were analyzed to examine wife's education and risk of primary cardiac arrest in the husband. Men whose wives had more than 12 years of education had 80 per cent the rate of men with less educated wives (odds ratio = 0.8, 95% confidence interval = 0.5, 1.3), after adjustment for risk factors. There was no evidence of a status incongruity effect. These data are inconsistent with reports of positive associations between wife's education and coronary heart disease. (*Am J Public Health* 1988; 78:1491–1493.)

Introduction

Data from the Framingham Study revealed that the risk of coronary heart disease among married men was positively associated with their wives' education.[1] Reports from other populations suggest that this association may apply especially to men who have low education or who demonstrate Type A behavior.[2,3] During the past 20 years, investigations of direct and indirect socioeconomic measures in the United States and Europe typically have found an inverse association with coronary heart disease,[4–9] so a positive relationship with wife's education is a notable exception and may reflect the impact of stress-inducing changes in women's social roles and marital expectations on the home environment.[1,2]

To provide further information on wife's education as a risk factor, we analyzed data from a community-based, case-control study of one major form of coronary heart disease, primary cardiac arrest (PCA). Because this study was restricted to married individuals, it offered the opportunity to examine associations involving wife's education, separately and in combination with husband's education.

Methods

The study design and methods have been described in detail elsewhere.[10,11] PCA was defined as a sudden, pulseless condition without evidence of non-cardiac cause.[12] All cases (fatal and non-fatal) of out-of-hospital PCA in King County, Washington between December 1979 and January 1981 were identified by trained paramedics. The study was restricted to 25-75 year old married residents of King County who had no history of clinically recognized heart disease or activity-limiting co-morbidity (e.g., chronic lung disease, musculoskeletal impairment). For all study subjects, information was obtained in home interviews with spouses. After each case was identified, a control subject meeting the same criteria for eligibility and matched for age (± 7 years), sex, and urban or suburban residence was chosen by random digit dialing.[13] Of eligible subjects identified, 89 per cent of case spouses and 85 per cent of control spouses agreed to participate, producing 163 case-control pairs. Eighty-two per cent of the case-control pairs were male, slightly over half were urban residents, and the average age of cases and controls was 58 and 57 years, respectively.

This analysis was restricted to the 133 male case-control pairs. Education of the men and their wives was classified as

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TABLE 1—Distribution of Male Primary Cardiac Arrest Case-Control Pairs According to the Education of Wife: King County, Washington, December 1979–January 1981

		Education of Wife of Control		
		≤12 years	>12 years	Total
Education of Wife of Case	≤12 years	34	42	76
	>12 years	27	30	57
	Total	61	62	133

less than or equal to 12 years (high school graduate or less) or greater than 12 years (beyond high school), yielding approximately equal numbers in each group. Other risk factors which were measured included physical activity (estimated by the Minnesota Leisure-Time Activity Questionnaire),[14] alcohol consumption, current smoking status, and current treatment for hypertension. Odds ratios (OR) were estimated by the conditional maximum-likelihood method using discordant pairs[15] and by logistic regression for matched case-control data.[16] The association between wife's education and PCA in the husband was examined in the absence and presence of other risk factors and by level of the husband's own education, to detect a status incongruity effect.

Results

The distribution of case-control pairs by wives' education is shown in Table 1. A wife who went beyond high school was less common among cases of PCA (OR = 0.6, 95 per cent CI = 0.4, 1.1). An OR of similar direction, magnitude, and precision was observed for the education of the men themselves (Table 2), with the more educated men at lower risk (OR = 0.7, 95 per cent CI = 0.4, 1.2). When variables representing wife's education and husband's education were entered into a conditional logistic model, the estimated OR for wife's education and PCA changed to 0.7 (95 per cent CI = 0.4, 1.2). The inclusion of a product term combining wife's education and husband's education revealed an absence of interaction; at both levels of husband's education, the estimated OR for wife's education was 0.7. When three categories of wife's education were considered (≤ 12 years, 13-15 years, ≥ 16 years) the OR's with ≤ 12 years as the referent category were 0.7 and 0.6, respectively.

The association between wife's education and primary cardiac arrest in the husband was also examined simultaneously with several risk factors (Table 3). The husband's education and activity level confounded the association slightly. Adjusted for all the risk factors, the OR for wife's education was 0.8 (0.5, 1.3).

Discussion

These results offer some evidence against the hypothesis that wife's education is directly associated with coronary heart disease in the husband.[1] As indicated by the confidence intervals, chance cannot exclude a weak association; also, there could have been unmeasured confounders in our data. If our findings are correct, differences between this study and previous studies may account for the discrepancy. For example, the effect of wife's education may vary for varying forms of coronary heart disease. Men in this study may differ from men studied previously, e.g., if few had Type A behavior.[3,17] However, the proportion of Seattle men with white collar occupations (52 per cent) would not indicate a likely deficit of Type A behavior.[18–20] The Seattle men were born somewhat later (mean year of birth = 1922) than the men of Framingham,[1] Rancho Bernardo,[2] or the Western Collaborative Group Study[3]; possibly secular changes in the social meaning and implications of wife's education have occurred.

Status incongruity and coronary heart disease has been a controversial subject, particularly since status incongruity is not easily defined and analyzed.[21–24] We view status incongruity effects as distinct from effects of the constituent status variables,[25] i.e., the risk for men with more educated wives would represent more than just the expected influence of two separate variables: wife's education and husband's education. These analyses suggest that a less educated husband and a more educated wife do not form a synergistic combination to increase risk of primary cardiac arrest.

TABLE 2—Distribution of Male Primary Cardiac Arrest Case-Control Pairs According to the Education of the Case/Control: King County, Washington, December 1979–January 1981

		Education of Control		
		≤12 years	>12 years	Total
Education of Case	≤12 years	26	38	64
	>12 years	26	43	69
	Total	52	81	133

TABLE 3—Adjusted Odds Ratios Relating Education of Wife to Primary Cardiac Arrest in the Husband: King County, Washington, December 1979–January 1981

Covariate*	Odds Ratio†	95% Confidence Interval
None	0.6	(0.4, 1.1)
Husband's education	0.7	(0.4, 1.2)
Husband's education, smoking	0.7	(0.4, 1.3)
Husband's education, hypertension	0.6	(0.4, 1.1)
Husband's education, physical activity	0.8	(0.5, 1.4)
Husband's education, alcohol consumption	0.7	(0.4, 1.2)
Husband's education, smoking, hypertension, physical activity, alcohol consumption	0.8	(0.5, 1.3)

*The covariates are defined as follows: husband's education (≤12/>12); current smoking status (yes/no); history of treatment for hypertension (yes/no); regular physical activity (above the median/below); monthly alcohol consumption (1–29 drinks/<1 drink; ≥30 drinks/<1 drink).

†Odds ratios were defined to contrast (wife's education >12 years)/(wife's education ≤12 years) and were derived from conditional logistic regression models.

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Effects of the North Carolina Prematurity Prevention Program among Public Patients Delivering at New Hanover Memorial Hospital

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Abstract: Twelve per cent of the 847 women who delivered in one hospital prior to implementation of the North Carolina Prematurity Prevention Program had low-birthweight births compared with 9.5 per cent of the 748 women who delivered during the program. Controlling for known risk factors, both low- and very-low birthweight births among Whites (Odds Ratio 2.0 and 3.7 respectively) and very-low-birthweight births among Blacks (OR 2.9) were reduced. (*Am J Public Health* 1988; 78:1493–1495.)

Introduction

In 1984, there were 8.2 neonatal deaths per 1,000 live births in North Carolina compared with 7.3 neonatal deaths per 1,000 live births in the United States in 1983.[1] Because premature delivery and low birthweight are major contributing factors to neonatal mortality,[2,3] the North Carolina Department of Human Resources initiated a statewide program to reduce the risk of prematurity; in January 1985 the obstetric clinic at New Hanover Memorial Hospital implemented this program.

Adapted from programs developed by Papiernik, Creasy, and Hobel,[4–6] the North Carolina Prematurity Prevention Program includes three components: patient identification, patient education, and staff education. Patient identification includes the use of a standardized risk assessment to identify women at risk of preterm labor. Patient education includes intensive education for all patients both on the signs and symptoms of preterm labor and on the need to seek early treatment if preterm labor occurs. Staff education includes in-service training for all staff on the importance of responding promptly to patient complaints of signs and symptoms of preterm labor. Staff are advised to freely admit and observe women suspected to be in preterm labor and, when appropriate, to treat these women using tocolytic agents.

New Hanover Memorial Hospital is a 520-bed community hospital with a university medical center affiliation. It is a regional referral center serving seven counties in the southeastern coastal area of North Carolina. Within the hospital, an obstetric outpatient clinic is staffed by University of North Carolina Medical School faculty, obstetric residents, staff nurses, and County Health Department personnel. Women seeking prenatal care at this facility are mainly young, poorly educated, economically disadvantaged, live in rural as well as urban areas, and about half are Black.

The purpose of this study is to evaluate the effectiveness of the Prematurity Prevention Program in reducing low-birthweight births in the population of women seeking prenatal care at this clinic.

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