1. Title: 
Occupational and Psychosocial Status as Risk Factors for Atherosclerosis

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3. Timeline: 
Analysis to be done starting in November using data from first and second visit.

4. Rationale: 
Advances in technology have reduced the need for jobs requiring heavy physical labour.1 As a result, the demands of life have become less labour intensive, and it has become more important to evaluate the psychosocial aspects of work and home.2 Considerable attention has focused on the psychosocial risk factors of disease, such as stress, depression and social support.3-11. Work related stresses in particular have been widely studied as potential risk factors of heart disease in men,8-13 and women,5,11,14-15 For example, in a prospective study done on a male working Swedish population, psychologically stressful jobs were found to be associated with cardiovascular disease, and situations of high strain, defined as those involving high demand and low control, may be independent risk factors for coronary heart disease,8 and have been associated with high levels of serum cholesterol.3 Other evidence exists to show a significant association with elevated risk of myocardial infarction in high strain groups.13 Additional evidence suggests that under situations of high demand and low control, the likelihood of depression and fatigue increases.2

Based on previous findings of associations between inadequate workplace social support and increases in the incidence of angina pectoris in men in Israel16 and coronary heart disease in female clerks,14 Johnson has taken Karasek’s job strain model one step further by adding social isolation and lack of social support as risk factors in the development of heart disease.9,10 Work-related social support was found to modify the impact of job strain, with higher prevalence ratios of CHD at each level of job strain in those with low levels of social support.10 Other literature has also supported the view that high levels of social support alleviates the effects of stress.4,11 Johnson further suggests that there may be a sex and class difference with respect to psychosocial risk factors of coronary heart disease.10 Social support may be different in its importance in predicting heart disease between men and women.5 Some literature has even suggested that women may have different types of support than men, with non-work related support playing a more important role in their lives than work-related support.4,11

Until recently, men were thought to be at a higher risk of developing stress-induced heart disease than women, due to the stresses they encountered at work.17-19 It was assumed that women who stayed at home, and therefore led a stressful life, would be at lower risk of developing such diseases. Evidence now exists that employed women are actually at a lower risk of developing CHD 15,20, are less vulnerable to depression21, and have a healthier lipid profile than full-time homemakers.15 Although this evidence
suggests employment as a potentially protective factor for the development of cardiovascular disease, other evidence exists that women with jobs and families are at increased risk of coronary disease. The Framingham Study14 and the Health and Nutrition Examination Survey I (HANES I)20 were two of the earliest studies to produce conflicting results when looking at the relationship between employment status and coronary disease. In the Framingham Study14, no differences were found in risk between working women and housewives with respect to coronary heart disease incidence and cardiovascular disease risk factors, whereas in HANES I20, employed women had lower levels of the risk factors for coronary heart disease than housewives, and were less likely to have elevated levels of serum cholesterol. It is important to note, though, that both of these studies differed in many ways. The Framingham Study used a prospective design, whereas the study using the HANES I data was cross-sectional in nature. They also differed in their definition of a "working woman." The Framingham Study defined a "working woman" as one who had been employed for at least half of her adult life, whether or not she was currently employed. On the other hand, the study using HANES I data, defined as "working woman" as one who was currently employed. It is also important to note that both of these studies were done before the large influx of women into the paid labor force occurred, and may therefore not be applicable to the situation facing women today.15

Recent findings from the San Antonio Heart Study15 support the claim that employed women have a healthier lipid and lipoprotein profile than housewives. Researchers in the San Antonio Heart Study also suggested that employed women have a healthier and less stressful life because of a greater sense of control they have over their life when compared to homemakers, although this claim was not supported by their data.15

Some attention has also been given to the increasing responsibilities that women have as they take on the roles of mother, wife and worker, and the impact that these multiple roles have on health outcome as a result of the increase in stress that those roles produce.6,21,22 This role overload has been associated with higher cholesterol level,6 and some evidence suggests that women with families, jobs and husbands are at increased risk of developing cardiovascular disease.6 One theory even cites children as the added source of stress,22 and incidence of coronary heart disease has been shown to rise as the number of children increases.14

Cardiovascular disease is the leading cause of death among men and women in the United States. The effects of risk factors, such as diabetes, smoking, obesity, and family history have been widely studied and proven to be associated with cardiovascular disease. What have not been as closely studied are the effects of psychosocial risk factors on heart disease between men and women, and the effects of occupational status between the sexes. Due to the controversial evidence regarding the risks of heart disease among women that work versus those that do not work, it is important to further investigate this area in order to clarify the relationship between employment and heart disease, and to see if similar relationships exist among men. Given that sources of stress may also be different for the sexes, it is also important to look at how different psychosocial variables, such as social support, depression and fatigue, affect the health of women as compared to men, and to see if these variables are independent risk factors for the development of atherosclerosis.

5. Main Hypotheses:
Occupational status and measures of psychosocial stress, such as social support, depression and fatigue, interact as risk factors of atherosclerosis. These associations between cardiovascular disease and occupational versus psychosocial status are different in men than in women. These associations are partially independent of the main cardiovascular risk factors.

6. Data:
Using men and women from the ARIC cohort, a cross-sectional study will be done to assess differences in carotid intimal-medial wall thickness according to levels of psychosocial risk factors. The cohort will be divided into percentiles based on level of carotid intimal-medial wall thickness, as measured by B-mode ultrasound from the second visit. Analysis will first view the cohort overall, and then stratify by sex and race
to test for sex and race differences that may occur. Responses to the psychosocial questionnaire from the second visit will be used to create scales of depression, social support, and fatigue which will be used to evaluate differences in atheroclerosis within the cohort. Using the occupational codes from the first visit and marital status from the second visit, percentiles will then be stratified according to employment status and marital status to test for interaction between occupational status, marital status and levels of depression, fatigue and social support. Confounders found in the first visit, such as age, smoking status, family history, physical exercise and weight, will then be adjusted for in the analysis to see if associations found in first analysis remain after adjustment. Cross-sectional findings in this analysis may be the basis for future prospective analyses.

PS. Mona Foad is a graduate student in the Department of Epidemiology at the Johns Hopkins School of Hygiene and Public Health, and will work under the supervision of Dr. Graham, Dr. Nieto, and Dr. Szklo.

REFERENCES


