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Mental vulnerability—a risk factor for ischemic heart disease

A new measure of mental vulnerability has been tested for its ability to predict objective heart disease. It was a significant moderate predictor. Mental vulnerability would probably increase the rate of reports of distress at work, leading to an association between stress and heart disease.

The Demands-Control (and Support) model of occupational stress has gained much credence since its relationship with heart related symptoms became apparent in cross sectional studies, and in one notable study of longitudinal design. The latest position on this seems to be that excessive demands, and not control or support, are significantly predictive of chest pain on a ten year time scale. There is some support for there being objective measures of heart disease associated with demands, but making corrections for potential confounding factors is complex and subject to error. Correction for personality traits is exceptionally rare in this kind of research. The research certainly does show that senior employment grade is associated with lower risk of heart disease.

Physical ill health is not strongly linked with stress measures in prospective studies. Reviews find that personality traits and depression are more strongly predictive of physical ill health.

In this study, type D, mental vulnerability describes an individual who has many psychosomatic symptoms and finds it difficult to socialize with other people. We observe that personality traits tend to be stable over extensive periods. The outcome of interest was a registered diagnosis of ischaemic heart disease (IHD).

Assessment of mental vulnerability was made using the following questionnaire:

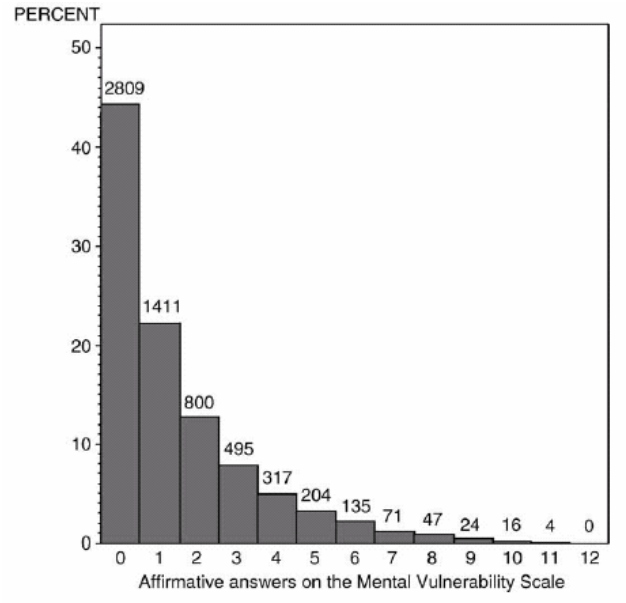
The Mental Vulnerability Scale, 12-question version

We would like to ask you some questions regarding your personal well being. Please do not think too much about the answers—just answer as you find most suitable.

1. Do your hands easily shake?
2. Do you often suffer from loss of appetite?
3. Do you often suffer from sleeplessness?
4. Do you often feel very tired?
5. Do you often take medicine, such as headache tablets, sleeping pills, tranquillizers or the like?
6. Do you often have pain in different parts of your body e.g. your stomach, neck, back or chest?
7. Do you often suffer from fits of dizziness?
8. Does your heart often beat very fast for no particular reason?
9. Is it difficult for you to make friends?
10. Do small things get much on your nerves?
11. Do you constantly have thoughts, which trouble and worry you?
12. Do you usually feel misunderstood by other people?

Three study populations were randomly sampled from the south-western part of Copenhagen County, and 8505 men and women were invited to participate. Of these, 6528 individuals (76.8%) participated in a general health examination. People with existing ischaemic heart disease were excluded from the study. 6333 responses were valid and retained for analysis. Baseline data on weight, height, blood pressure, total cholesterol, gender, age, diabetes, cardiovascular disease, tobacco consumption, alcohol consumption, type D mental vulnerability and physical activity were elicited by questionnaire. Outcomes were taken from medical registries migration register.

The following figure shows the distribution of ‘yes’ answers to the 12 item questionnaire:



Individuals with zero to two affirmative answers were classified as not vulnerable, individuals scoring three to four = medium vulnerability (12.8%), and those scoring five or more = highly vulnerable (7.9%).

At baseline, medium and high vulnerability were associated with female gender, hypertension, physical inactivity, higher smoking levels and social class. These variables were therefore active in multivariate analysis of ischaemic heart disease outcomes.

The mean follow-up time was 13.4 years (maximum = 22.7 years), mean age at baseline 45.5 years. In one analysis, those who became cases within 2 years of baseline were excluded in order to reduce the contribution from reverse causation.

The fully adjusted relative risk of IHD for those described as moderately vulnerable was 1.41 (95% CI = 1.04 to 1.91) and for the strongly vulnerable; 2.05 (95% CI = 1.46 to 2.88). The two year exclusion reduced the later risk estimate to 2.0 (95% CI = 1.4 to 2.9). Analysis with respect to item 6 on the 12 point scale revealed a hazard ratio of 1.8 (95% CI = 1.2 to 2.7).

Comment

The study had a number of high quality features; participation rate, objective outcomes, prospective design, relevant period of study and a validated risk measurement tool. However, it is not clear that those with high vulnerability would be proportionately selected in a volunteer study such as this.

Reverse causation was not significant in this study.

The association between high vulnerability and IHD is significant in this analysis. The mechanism of this association would be critical to understanding whether any fault attached to it.

Prospective changes in vulnerability score (specific items on the 12 point scale would be of more interest) as a response to occupational stress would encourage the view that occupational stress was a risk factor for IHD. There have been no assessments of this as yet.