

# Mental vulnerability associated with increased risk of cardiovascular disease

April 18 2013

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People deemed to be "mentally vulnerable" are at a significantly increased risk of both fatal and non-fatal cardiovascular disease, according to results of a large population study from Denmark. The details of the study were presented today at the EuroPrevent 2013 congress in Rome. (1)

The study's first author, Dr Anders Borglykke from the Research Centre for Prevention and Health at Glostrup University Hospital, Denmark, explained that [psychosocial factors](#) and [personality traits](#) have been consistently associated with [cardiovascular disease](#) and all-cause mortality, but their role in the prediction of risk was still not clear. This study was to investigate whether mental vulnerability (defined as "a tendency to experience [psychosomatic symptoms](#) or inadequate interpersonal reactions") increases the [risk of cardiovascular disease](#) and the precision of [prediction models](#) for cardiovascular disease.

The study incorporated data from three prospective Danish population cohorts from which almost 11,000 individuals free of any cardiovascular disease were followed-up for a mean period of 15.9 years (a total of 166,787 person-years). During this follow-up period all [cardiovascular events](#) (fatal and non-fatal) were recorded and, at the outset of the study, mental vulnerability measured on a validated 12-point scale originally constructed by the Military Psychology Services in Denmark. The results categorised subjects into three groups: "non-vulnerable, latent or mentally vulnerable".

"The scale consists of questions on both mental and physical symptoms," said Dr Borglykke, "and generally measures a level of stress or a personality which is more receptive to stress. The scale has previously been found associated with early mortality and ischaemic heart disease." (2) To assess the predictive ability of the scale, the results were added to a [statistical model](#) with classical [risk factors](#) for cardiovascular disease (age, sex, smoking, systolic blood pressure and total cholesterol).

During the follow-up period there were 3045 fatal and non-fatal cardiovascular events recorded in the study population of 10,943 subjects. When the statistical analysis was performed, results showed that mental vulnerability was significantly associated with fatal and non-fatal cardiovascular events independently of the classical risk factors; the risk of events in the mentally vulnerable was 36% higher than in the non-vulnerable (hazard ratio 1.366; 1.208 - 1.545).

Are the findings sufficiently robust to suggest that mental vulnerability is considered an independent marker of cardiovascular disease - and as such able to improve the precision of [risk prediction](#)? "Several studies have found risk factors for cardiovascular disease which are clearly independent but within a broader context contribute little if anything to actual risk prediction," explains Dr Borglykke. "One of the reasons for this is that the impact of the well established risk factors - age, sex, smoking, blood pressure and total cholesterol - tend to dominate the risk stratification models. This means that a risk factor such as our scale of mental vulnerability clearly increases the risk significantly - by 36% - but still does not improve risk prediction in the general population."

Statistical analysis in this study showed that adding mental vulnerability to a risk stratification model which included the principal risk factors resulted in only very small changes in discriminative ability.

"However," added Dr Borglykke, "these results do not necessarily mean

that we should ignore mental vulnerability in our assessment of individual risk. It is still possible that it might improve risk prediction - or even emerge as a new marker to explain or reclassify some cardiovascular cases which cannot be attributed to classical risk factors.

"So mental vulnerability might describe a 'new dimension' when compared to the five classical risk factors, but to take this forward we need to identify sub-groups of the population where mental vulnerability does improve risk prediction beyond the classic risk factors."

Commenting on how mental vulnerability might be associated with cardiovascular disease, Dr Borglykke suggested that the chronic psychological stress experienced by mentally vulnerable people might provide one explanation. This, he added, might also provide a clue for reducing the risk - by removing the triggers of chronic stress to which such individuals are exposed.

**More information:** 1. Borglykke A, Ebstrup J, Jørgensen T, et al. Mental vulnerability as a predictor of cardiovascular disease and death. Presented at EuroPREvent 2013 Congress Final Programme Number P52.

2. Eplov LF, Jørgensen T, Birket-Smith M, et al. Mental vulnerability - a risk factor for ischemic heart disease. J Psychosom Res 2006; 60: 169-76.

Provided by European Society of Cardiology

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