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Psychological distress, physical illness and mortality risk

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Abstract

Background: Psychological distress has been associated with an increased risk of overall and disease-specific mortality risk. This study examines whether the length of follow-up time influences mortality risk. **Methods:** The associations between psychological distress and all-cause and coronary heart disease mortality were modelled using proportional hazards modelling in a prospective cohort study of 6920 men and women aged 45–64 years. Psychological distress was assessed at baseline using the 30-item General Health Questionnaire (GHQ-30). **Results:** Psychological distress was associated with a 5-year all-cause mortality (RR 1.68 95% CI 1.07–2.62) and CHD mortality (RR 1.64 95% CI 1.02–2.56) in men after adjustment for socio-demographic and CHD risk factors, but not after further adjustment for baseline physical illness (RR 1.41 95% CI 0.88–2.23) for all-cause mortality (RR 1.39 95% CI 0.88–2.21) for CHD mortality. Psychological distress was not associated with all-cause and CHD mortality at 15- and 20-year follow-up. **Conclusions:** Psychological distress is a reflection of baseline physical illness that increases mortality risk. Psychological distress maybe on the causal pathway between physical illness and mortality risk.

Keywords: Psychological distress; CHD mortality; Longitudinal study

Introduction

Psychological distress has been found to predict mortality in community populations [1–5]. An association has also been found using depressive illness classified by DSM-III criteria [6] and self-reports of major depression [7]. The association between psychological distress and increased risk of mortality has also been found for scales measuring depressive symptoms, e.g., CES-D Scale [2,3,8–11], the Geriatric Depression Scale [12], and for nonspecific screening questionnaires for psychological distress like the 30-item General Health Questionnaire (GHQ-30) [5]. In this study, psychological distress was associated with a 64% increased risk of 7 years mortality in men and 58% increased risk in women, after full adjustments for socio-demographic smoking and physical illness.

Psychological distress has also been found to predict disease-specific mortality, particularly CHD mortality [8,13,14]. Recent investigations have suggested a differential effect in men and women of depressive symptoms on CHD incidence [15] and mortality; distressed men had over twice the risk of CHD mortality than nondistressed men, but distress was not associated with CHD mortality in women [8].

In studies that have found an association between psychological distress and all-cause and disease-specific mortality risk, the follow-up period over which this is evident is unclear. Some studies find that psychological distress is associated with 4–7 years all-cause mortality risk [3,5,11], while others find an association between psychological distress and all-cause mortality after 10 years of follow-up [8]. The interval between psychological distress and mortality has implications for the mechanism of this association. A short interval is in keeping with explanations either related to psychological distress at baseline being related to subclinical physical ill health, which independently predicts mortality, or to short-term effects of psychological distress on coronary heart disease risk mediated through increased risk of thrombosis, arrhythmias or inflammation. A longer interval between psychological distress and mortality would support aetiological explanations based on

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psychological distress having long-term influences on risk factors such as smoking or through pathophysiological processes such as atherogenesis.

The aim of this investigation was to examine the association between psychological distress and all-cause and CHD mortality in men and women followed up for 20 years in the Renfrew and Paisley study; to examine whether length of follow-up time influences the mortality risk associated with psychological distress.

Method

The study population and instruments used in the initial clinical screening examination have been described previously [16,17].

Design and sampling

The study design was a prospective cohort study of a community sample of men and women followed up for over 20 years. Eligibility for the Renfrew and Paisley study (one of the MIDSPAN studies) [18] was established by carrying out a door-to-door survey of all households in the two towns. Between 1972 and 1976, everyone aged 45–64 years who met the residency criteria was invited to attend 1 of 12 centres for a screening examination. Renfrew was screened first. A total of 7052 men and 8354 women aged between 45 and 64 took part in the study, a response rate of 80%.

Psychological distress was measured using GHQ-30 [19]. The GHQ is a nonspecific measure of psychological distress that not only measures a depressive syndrome but also anxiety, social impairment and hypochondriasis. Each item of the GHQ is scored either as 0, 0, 1, 1, the 0's denoting problems as absent and 1's as present. Each item contributes to a total score. At baseline, a threshold of 3/4 on GHQ-30 was selected to denote possible psychiatric caseness. Respondents scoring on four or more questions were considered to be cases. This threshold was based on the results of a validation study, which involved some participants from the MIDSPAN [18] study, carried out as a prelude to the MRC Mild Hypertension Study [20]. The sensitivity and specificity of the GHQ-30 is estimated to be 81% and 80%, respectively [21].

After the initial screening phase of the survey had been underway in Paisley for 7 months, the GHQ was introduced in the Paisley sample. Thus, early participants did not complete the GHQ. At baseline, GHQ data were collected from 3783 (44.7%) men and 4683 (55.3%) women. The low proportion of completed GHQ was due to the late introduction of the GHQ and not due to missing data. Participants in Paisley who completed the GHQ compared to early participants who did not have the opportunity to do the GHQ were more likely to be women than men (55% vs. 53%), manual than nonmanual social class (60% vs. 70%) and married than nonmarried (78% vs. 22%). Early participants who did not complete the GHQ had higher blood pressure and higher body mass index (BMI). Early participants did not differ from GHQ completers in terms of prevalence of angina, bronchitis, diabetes, ECG ischaemia and stroke.

Screening examination

The baseline examination in 1972–1976 included measurement of height and weight from which BMI was calculated. A 10-ml blood sample was taken from which glucose was determined by the measurement of oxygen consumption [22]. Plasma cholesterol was determined by autoanalyser [23]. Systolic (SBP) and diastolic blood pressures (DBP) were measured seated using the London School of Hygiene and Tropical Medicine sphygmomanometer [24]. The forced expiratory volume in 1 s (FEV_1) was measured with the use of a Garthur Vitalograph spirometer with the subject standing. FEV_1 relative to the predicted value was used to estimate impairment. The predicted values were based on a healthy sample of never smokers who answered ''no'' to questions on wheeze, breathing and asthma. Predicted values were obtained from linear regression on age and height. A six-lead electrocardiogram (I, II, III, aVR, aVL and aVF) coded by the Minnesota code was used to determine ischaemia.

Participants completed a questionnaire including information on sociodemographic factors. Social class was determined by occupation, according to the registrar general's classification. The categories were I, II, IIINM, IIIM, IV and V. Women were allocated their own social class except for housewives and retired women whose husbands' or fathers' occupation were used instead. Questionnaires on chronic illness included the MRC Bronchitis Questionnaire and the Rose Angina Questionnaire. Questions on smoking habits were classified as never-smoker; pipe or cigar smoker only; 1–14, 15–24, ≥25 cigarettes per day; and ex-smoker.

Statistical methods and mortality end points

The statistical analyses are based on only those respondents who had values on all variables used in the analyses. Therefore, the analyses are based on 2970 men and 3678 women. The analyses of the sample that were free of baseline physical illness are based on 2176 men and 2765 women. Respondents were defined as free of physical illness at baseline survey by absence of angina, bronchitis, diabetes, ECG ischaemia and stroke. Chi- square and *t* tests were used to compare the sample characteristic differences between male and female GHQ cases and noncases.

The population was flagged at the National Health Service Central Registry in Edinburgh and deaths were reported to end of 1996. Causes of death were classified using the *Ninth Revision of the International Classification of Diseases*. Two mortality end points, all-cause mortality and CHD mortality (ICD codes 410–414) were used in the analyses. Cox's proportional hazards regression models adjusted for age