Journal of Psychosomatic Research 112 (2018) 66–72

Contents lists available at ScienceDirect

Journal of Psychosomatic Research

journal homepage: www.elsevier.com/locate/jpsychores

Mental health is a risk factor for poor outcomes in cardiac patients: Findings from the national DenHeart survey

Selina Kikkenborg Berg[a,*], Trine Bernholdt Rasmussen[b], Lars Thrysoee[c], Charlotte Brun Thorup[d], Britt Borregaard[e], Anne Vinggaard Christensen[a], Rikke Elmose Mols[f], Knud Juel[g], Ola Ekholm[g]

[a] Department of Cardiology, Copenhagen University Hospital, Blegdamsvej 9, 2100 Copenhagen, Denmark
[b] Department of Cardiology, Herlev and Gentofte University Hospital, Niels Andersens Vej 65, 2900 Hellerup, Denmark
[c] Department of Cardiology, Odense University Hospital, University of Southern Denmark, J.B. Winsløwsvej 4, 5000 Odense C, Denmark
[d] Department of Cardiology, Department of Cardiothoracic Surgery and Clinical Nursing Research Unit, Aalborg University Hospital, Hobrovej 18-22, 9000 Aalborg, Denmark
[e] Department of Cardiothoracic and Vascular Surgery, Odense University Hospital, J.B. Winsløwsvej 4, 5000 Odense C, Denmark
[f] Department of Cardiology, Aarhus University Hospital, Palle Juul-Jensens Blv. 99, 8200 Aarhus N, Denmark
[g] National Institute of Public Health, University of Southern Denmark, Øster Farimagsgade 5A, 1353 Copenhagen, Denmark

ARTICLE INFO

Keywords:
Anxiety
Depression
Cardiac patients
Risk behaviour
Mortality

ABSTRACT

Objective: To explore (i) the prevalence of cardiac risk factors (obesity, smoking, excessive alcohol consumption and medication non-adherence) among cardiac patients with depression and anxiety, (ii) associations between depression and anxiety scores and cardiac risk factors and (iii) the association of depression and anxiety and cardiac risk factors with mortality, and their population attributable risk.

Methods: A national cross-sectional study using patient-reported outcomes at discharge and national register data. For one year (April 15th 2013 to April 15th 2014) all patients discharged or transferred from the five Danish Heart Centres were included in the study. A total of 14,239 patients answered the HADS questionnaire, response rate 51%.

Results: Mean age was 64.8 years and 69% were male. Patients with depression or anxiety (HADS-D or HADS-A score ≥ 8) had 30% and 45%, respectively, higher odds of being current smokers; 19% and 37% higher odds of being obese and 31% and 24% higher odds of excessive alcohol consumption. Depressive patients had 34% higher odds of being non-adherent to their medication. At one-year follow-up, patients with depression (HADS-D score ≥ 11) had the highest attributable risk associated with mortality followed by: smoking, ischemic heart disease, anxiety, diabetes, hypertension chronic obstructive pulmonary disease and excessive alcohol consumption.

Conclusion: Depression and anxiety in patients with cardiac disease is associated with cardiac risk behaviour such as smoking, obesity, excessive alcohol consumption and medication non-adherence. Depression and anxiety have an attributable risk associated with mortality that is comparable to other well-known risk factors such as smoking.

1. Introduction

1.1. Background

Depression and anxiety are common conditions among cardiac patients as up to 15% of patients across different diagnoses report symptoms of depression and 25% report symptoms of anxiety [1–3]. Depression and anxiety may lead to cardiac risk behaviour, including unhealthy eating habits, smoking, excessive alcohol consumption and medication non-adherence [4–7]. These cardiac risk factors are known

Abbreviations: BMI, body mass index; CABG, coronary artery bypass graft; CI, confidence interval; COPD, chronic obstructive pulmonary disease; HADS, Hospital Depression and Anxiety Scale; HR, hazard ratio; MI, myocardial infarction; OR, odds ratio; PAR%, population attributable risk percent; PCI, percutaneous coronary intervention; PRO, patient-reported outcome; PTSD, post-traumatic stress disorder; SD, standard deviation

* Corresponding author at: Department of Cardiology, Rigshospitalet, Blegdamsvej 9, 2100 Copenhagen, Denmark.
E-mail addresses: selina@rh.dk (S.K. Berg), trine.bernholdt.rasmussen@regionh.dk (T.B. Rasmussen), Lars.Thrysoee@rsyd.dk (L. Thrysoee), cbt@rn.dk (C.B. Thorup), Britt.Borregaard@rsyd.dk (B. Borregaard), anne.vinggaard.christensen@regionh.dk (A.V. Christensen), rikkmols@rm.dk (R.E. Mols), kj@si-folkesundhed.dk (K. Juel), oek@si-folkesundhed.dk (O. Ekholm).

https://doi.org/10.1016/j.jpsychores.2018.07.002
Received 11 April 2018; Received in revised form 10 July 2018; Accepted 10 July 2018

to increase the risk of poor outcomes, e.g. morbidity or mortality in cardiac patients [8]. In the DenHeart study, an association between symptoms of depression, anxiety and mortality has been established across cardiac diagnoses with a HR up to 2.29 (95% CI 1.81–2.90) [9]. The American Heart Association recommend that depression should be elevated to the status of a risk factor for adverse medical outcomes in patients with acute coronary syndrome [10]. However, this only applies for depression and acute coronary syndrome and not anxiety and quality of life and not for other cardiac diagnoses such as arrhythmia and heart failure.

Poor outcomes due to depression and anxiety could be explained by both physiological and behavioural processes. Psychological factors stimulate the autonomic nervous system, which triggers production of catecholamines, increases blood pressure, constricts coronary arteries and increases platelet activity. Consequently, patients suffer increased thrombogenesis, arrhythmogenesis, reduced heart rate variability, myocardial ischemia and impaired ventricular function [11]. Moreover, behavioural mechanisms are another link between mental status and cardiac disease. Individuals with symptoms of depression and anxiety are suggested to have an unhealthier food intake, smoke more, consume more drugs and/or alcohol, be less adherent to treatment, sleep poorly, and be less physically active [7]. These elements are risk factors associated with progression of cardiac disease and thus, subsequently, the identified adverse outcomes [12].

As both depression and anxiety symptoms and behavioural cardiac health risks are prevalent in cardiac patients it is relevant to investigate whether there is an association between symptoms of depression and anxiety and risk behaviour across cardiac diagnostic groups. If patients with depression or anxiety have a higher prevalence of poor cardiac risk behaviour they are at increased risk of adverse outcomes. It is also crucial to determine the attributable risk of depression and anxiety in prioritizing interventions to reduce mortality. Depression and anxiety are potentially modifiable which make the association with mortality clinically relevant. Furthermore, cardiac risk modification initiatives might be ineffective if depression and anxiety are not successfully treated.

Thus, the overall purpose was to gain insight into the mechanisms that cause higher mortality in cardiac patients with depression and anxiety.

1.2. Objectives

The objectives were, in cardiac disease patients, to explore (i) the prevalence of cardiac risk factors (obesity, smoking, excessive alcohol consumption and medication non-adherence) among patients with depression and anxiety, (ii) the associations between depression and anxiety scores and cardiac risk factors and (iii) the association of depression, anxiety and cardiac risk factors with mortality and their population attributable risk.

2. Methods

2.1. Study design

The DenHeart study was designed as a centre-based cohort study based on patient-reported data and national register data. All patients admitted to a Heart Centre were asked to fill out a paper-based questionnaire at hospital discharge to evaluate patient-reported outcomes (PROs) across cardiac diagnostic groups. The methods were thoroughly described in the published study protocol [13].

In previously published papers from the DenHeart study we reported diagnostic differences in symptoms of depression and anxiety between cardiac groups [3]. We also reported that depression and anxiety are predictors of both mortality and cardiac events after 1 year across cardiac diagnoses [9]. For the current paper we take the next step and try to explain the association between depression/anxiety and mortality/cardiac events by looking at cardiac risk factors. This paper is investigating if patients´ with depression and anxiety have more risk factors (e.g. smoking and obesity) potentially leading to the poorer outcomes already documented from the DenHeart study [9]. Furthermore, we wanted to follow up on the American Heart Association suggestion of elevating depression as a risk factor [10] by investigating the population attributable risk of depression and anxiety on mortality compared to other known risk factors.

2.2. Setting and participants

For one year (April 15th 2013 to April 15th 2014) all patients discharged or transferred from the five Danish Heart Centres were included in the study.

2.3. Eligibility criteria

All patients were unselected and consecutively included. Patients under 18 years of age, without a Danish civil registration number and unable to understand Danish were excluded from the study. For ethical reasons, patients who were unconscious when transferred were also excluded.

2.4. Recruitment

Patients were asked to complete and return the questionnaire before they left the hospital or to do so at home within three days of discharge and return it by mail. Patients who were transferred to another hospital were asked to fill out the questionnaire at final discharge.

Patients were recruited by a ward nurse or by a research assistant nurse. All nurses at the Heart Centres, approximately 800, were informed about the study and procedures at ward meetings. Moreover, guidelines were distributed and a website established (www.DenHeart.dk). The questionnaire was distributed with a postage pre-paid envelope to facilitate its return.

2.5. Data sources/measurement

The DenHeart questionnaire consisted of a series of well-validated questionnaires and a number of ancillary questions. The questionnaire consisted of 80 questions. It was tested for feasibility in a small sample and took approximately 20 min for patients to fill out. Among other questionnaires, the Hospital Depression and Anxiety Scale (HADS) was included in the DenHeart survey. HADS is a 14-item questionnaire that assesses levels of depression and anxiety in medically ill patients admitted to non-psychiatric hospital clinics. The scale offers two scores, HADS-D and HADS-A, and consists of seven questions to assess depression and seven to assess anxiety [14]. For each of the questions the respondent chooses from four responses to indicate the extent to which each applies for the last week. HADS is a valid and internally consistent measure, with a mean Cronbach's alpha of 0.82 and 0.83 for the HADS-D and HADS-A, respectively [15]. Scores of 0 to 7 for either subscale are regarded as normal and scores of 8 to 10 suggest the possible presence of a mood disorder. Scores of 11 and above indicate the probable presence of a mood disorder [16]. In this paper, when we report depression and anxiety it is based on this patient-reported questionnaire. For the sake of readability, we use “depression and anxiety” and not possible or probable depression and anxiety throughout the paper.

The survey also included nine questions about health and health behaviour from the Danish Health and Morbidity Survey and the Danish National Health Survey [17, 18] and one question regarding medication adherence.

Data from the following Danish national registers were collected on all identified patients at baseline: The Danish Civil Registration System [19], The Danish National Patient Register [20], and the Danish Education Registers [21].