

The presence of a depressive episode predicts lower return to work rate after myocardial infarction ☆☆☆

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ABSTRACT

Context: No studies have evaluated whether the presence of a depressive episode is associated with an increased risk of not returning to work following myocardial infarction (MI).

Objectives: To examine the prospective associations between depressive episode and anxiety disorders with return to work (RTW) after MI at 3 and 12 months based on *International Classification of Diseases, 10th Revision*.

Design: Prospective cohort study.

Setting: Four hospitals in the North of The Netherlands.

Participants: From a sample of patients hospitalized for MI ($n=487$), we selected those who had a paid job at the time of the MI ($N=200$).

Main exposure measures: Presence of a depressive episode and presence of any anxiety disorder during the first 3 months post-MI.

Main outcome measures: RTW at 12 months post-MI.

Results: Of the patients with work prior to MI, 75% had returned to work at 12 months. The presence of a depressive episode during the first 3 months (prevalence: 19.4%) was a significant predictor of no RTW at 12 months post-MI, also after controlling for confounders [odds ratio (OR) 3.48; 95% confidence interval (CI): 1.45–8.37]. The presence of an anxiety disorder (prevalence: 11.9%) had a borderline significant association with no RTW as well. This association remained after controlling for confounders (OR 2.90; 95% CI: 1.00–6.38) but diminished when controlling for depression.

Conclusions: The presence of a depressive episode was associated with an increased risk of no RTW in MI patients. The association between anxiety and risk of no RTW could in part be explained by the presence of depression. Further studies may address the possibility of countering the effect of depression by effective treatment.

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1. Introduction

Work is important to the individual, his/her family and social network, the employer and society at large. Poor work outcomes have been found in workers with myocardial infarction (MI), in particular, those with co-existing depressive symptoms [1,2]. A recent review, including 12 articles covering the period from 1994 to 2009, showed that depression significantly predicted a reduced likelihood to return to work (RTW) following MI in 7 out of 12 studies [3]. Unfortunately, none of the included studies used a diagnostic interview but relied on

self-reported questionnaires to assess the presence of depressive symptoms. As depressive symptoms following MI may sometimes occur as a physiological consequence of the heart disease [4] and generally are associated with a large proportion of false positive screens to identify major depressive disorder cases [5,6], it remains unclear whether the reduced likelihood of RTW is a true result of a depressive episode. Given the importance of RTW in MI patients and the potential to treat depression, it is important to evaluate the impact of a clinical diagnosis of post-MI depressive episode on RTW.

Besides depression, also anxiety appears to be associated with impaired work outcomes. Like depressive episodes, anxiety disorders are associated with longer sick leave duration [7], and anxiety is associated with delayed RTW in several medical conditions including occupational injury [8], traumatic brain injury [9] and head and neck cancer [10]. A recent meta-analysis identified only two studies evaluating the impact of anxiety on RTW in coronary artery disease patients [11], showing inconsistent results. Therefore,

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the impact of anxiety after MI on RTW remains unclear and should be addressed.

In the present study, we examined the effects of post-MI depressive disorder and anxiety disorder as obtained with a diagnostic interview on RTW rates at 12 months after the MI.

2. Methods

2.1. Study design and participants

The study was conducted using the data from the Depression After Myocardial Infarction (DepreMI) study, a naturalistic cohort study to evaluate the association of depression with cardiovascular prognosis in MI patients. Patients admitted for MI were recruited consecutively from four hospitals in the North of The Netherlands between September 1997 and September 2000. Details of this study have been described previously [12]. To be included, patients had to fulfill at least two of the following criteria: (1) 20 min of chest pain, (2) increased enzyme levels (creatinine phosphokinase and creatinine phosphokinase-MB) and (3) new pathological Q waves on the electrocardiogram in at least two leads. Exclusion criteria were (1) life expectancy of less than a year due to non-cardiac condition, (2) MI occurring during admission for another reason, (3) poor physical function, (4) cognitive dysfunction, (5) inability to speak or read Dutch and (6) follow-up visits scheduled in a nonparticipating hospital. For the present analysis, an additional inclusion criterion was that patients had to have paid work during the year before MI. Previous reports on the sample have shown that, following MI, (persistent) depressive symptoms, depressive episode and generalized anxiety disorder were associated with mortality and cardiovascular events [13–16].

2.2. Assessment of demographical and clinical characteristics

Age, gender and clinical characteristics were assessed during hospital admission for the index MI and from hospital charts. Left ventricular ejection fraction (LVEF) was assessed with echocardiography, radionuclide ventriculography, gated SPECT, magnetic resonance imaging, angiography or clinical assessment and was classified as <40% or ≥40%. Educational level and marital status were obtained during the interview 3 months post-MI.

2.3. Assessment of depression and anxiety

The presence of a depressive disorder and anxiety disorder (i.e., agoraphobia, panic disorder, specific phobia, social phobia and generalized anxiety disorder) post-MI according to *International Classification of Diseases, 10th Revision (ICD-10)* [17,18] was assessed with the Composite International Diagnostic Interview (CIDI) at 3 months after the MI. The CIDI is a fully structured interview with a satisfactory inter-rater reliability [19]. In the present study, we used a slightly adjusted version of the CIDI interview so that the time frame of the depression and anxiety diagnosis reflected the period of approximately 3 months following the MI.

2.4. Assessment of RTW and other work-related aspects

At 3 and 12 months post-MI, patients also underwent a face-to-face interview regarding several aspects related to rehabilitation. During the interview at 3 months post-MI, patients were asked whether they had paid work in the year before the MI. If they answered yes, they were asked whether it was mainly a sedentary or active job, whether it was light or heavy work and the number of work-hours per week. RTW was assessed during the same interviews. Patients who reported that they returned to work were asked how many hours they currently work per week and whether there were adaptations of their tasks (work accommodations).

2.5. Statistical analysis

Differences in baseline characteristics for patients who returned to work and patients who did not RTW were assessed with chi-square or *t* tests for two independent samples. This was done with respect to RTW status at 3 and 12 months post-MI.

The associations between the presence of a depressive episode and an anxiety disorder at 3 months post-MI with RTW status at 12 months post-MI were assessed with logistic regression. Adjustments were made for age and sex (model 1) and for age, sex and LVEF (model 2) only because the sample size was too small to adjust for more covariates without introducing potential bias [20]. Finally, a third model was tested in which depression and anxiety were entered simultaneously, adjusting for age, sex and LVEF. Significance level was set at $P < .05$ (two-tailed).

3. Results

3.1. Sample characteristics

Of 1166 MI patients that were assessed for eligibility, 528 (45.3%) participated in the DepreMI study. Of these, 487 were interviewed at 3 months post-MI and were assessed for paid work in the year before MI. A total of 200 (41.1%) patients had paid work in the year before MI. Of these patients, 186 patients provided complete data on RTW at 3 months post-MI, of whom 86 (46.2%) patients had returned to work and 100 had not. Complete data on RTW at 12 months were available for 173 patients, of whom 133 (76.9%) had returned to work and 40 had not. Fig. 1 shows the flow chart.

Table 1 shows sociodemographic, work-related and clinical characteristics for patients who had/had not returned to work at 3 months and 12 months post-MI. Compared to patients who had not returned to work at 3 months post-MI, patients who had returned to work were significantly higher educated, were more likely to

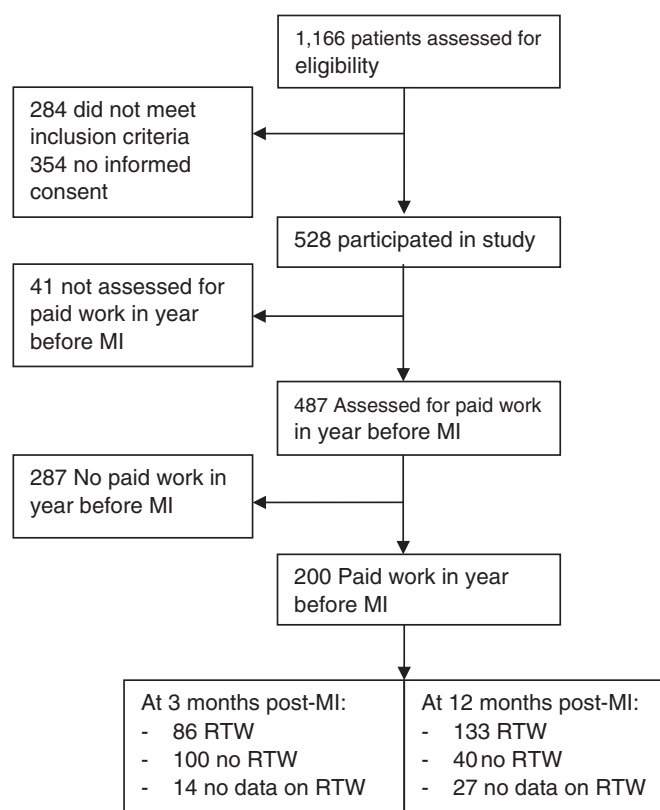


Fig. 1. Flow chart of MI patients enrolled in the present analysis.

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