Psychiatry Research 228 (2015) 448–453

Contents lists available at ScienceDirect

Psychiatry Research

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

Risk factors for incident depression in patients at first acute coronary syndrome

Paolo Ossola [a,b,*], Francesca Paglia [a], Annalisa Pelosi [c], Chiara De Panfilis [a,b], Giulio Conte [d], Matteo Tonna [b], Diego Ardissino [d], Carlo Marchesi [a,b]

[a] Department of Neuroscience, Psychiatry Unit, University of Parma, Parma, Italy
[b] Mental Health Department, AUSL, Parma, Italy
[c] Department of Neuroscience, Psychology Unit, University of Parma, Parma, Italy
[d] Department of Cardiology, University Hospital, Parma, Italy

ARTICLE INFO

Article history:
Received 19 January 2015
Received in revised form
6 May 2015
Accepted 25 May 2015
Available online 27 June 2015

Keywords:
Major depression
Minor depression
Positive affect
Anxiety
Women
Widowed

ABSTRACT

The association between depression and acute coronary syndrome (ACS) is well-established and the first seems to impact meaningfully on cardiac prognosis. Nonetheless only a few studies have evaluated the relationship between incident depression, defined as new cases in patients with no history of depression, and ACS. Therefore the aim of this study is to analyse the risk factors of incident depression in a sample of patients who were presenting their first ACS. 304 consecutive patients were recruited. The presence of major (MD) and minor (md) depression was assessed with the Primary Care Evaluation of Mental Disorders (PRIME-MD), whereas its severity was evaluated with the Hospital Anxiety and Depression Scale (HADS). Evaluations were collected both at baseline and at 1, 2, 4, 6, 9 and 12 month follow ups. Out of 304 subjects (80.6% males), MD was diagnosed in 15 (4.9%) and md in 25 patients (8.2%). At baseline risk factors for a post-ACS depressive disorder were being women (MD only), widowed (md only) and having mild anhedonic depressive symptoms few days after the ACS. Clinicians should keep in mind these variables when facing a patient at his/her first ACS, given the detrimental effect of depression on cardiac prognosis.

1. Introduction

The association between depression and acute coronary syndrome (ACS) is well-established (Hare et al., 2014).

Depression in patients with ACS is associated with a worse cardiac outcome (Lichtman et al., 2014) due to an increase recurrence of cardiac events and mortality (Nicholson et al., 2006).

Risk factors for the development of depression after ACS have been also identified: younger age (Lespérance et al., 1996; Dickens et al., 2004; van Melle et al., 2006); female gender (Doyle et al., 2015); low level of education (Frasure-Smith et al., 2007; Carney et al., 2009); low socio-economic status (Steptoe et al., 2011); having no close friend (Frasure-Smith et al., 2000); being unemployed and living alone (Larsen et al., 2013; Spijkerman et al., 2005a); Type D personality (Martens et al., 2008); psychological vulnerabilities (i.e. exhaustion, fatigue, interpersonal difficulties, cognitive distortions) (Ladwig et al., 1992; Ketterer et al., 1998; Strik et al., 2001; Rieckmann et al., 2006; Stafford et al., 2009; Doyle et al., 2011; Denton et al., 2012) and the presence of depressive symptoms in the few days after an ACS (Di Benedetto et al., 2007; Celano et al., 2012; Marchesi et al., 2014a).

The severity of the ACS has been proposed as another risk factor for developing depression; however, this association was found by some authors (van Melle et al., 2006; Frasure-Smith et al., 1999; de Jonge et al., 2006) and not by others (Lane et al., 2005; Lett et al., 2008).

Depression after ACS can be distinguished in two types: a post-ACS depressive episode in patients who have never been depressed before (incident depression) and depression that was present at the time of the ACS or already before (non-incident depression). Little is known about the aetiology and characteristics of incident depression and it remains unclear to what extent it should be considered a transient distress reaction to a life-threatening event (Lloyd and Cawley, 1982; Spijkerman et al., 2005b).

Few studies assessed risk factors specifically for incident depression in cardiac population. Contrasting results emerged regarding the severity of the ACS, where some studies observed this effect (Spijkerman et al., 2005a; Freedland et al., 1992) and other did not (Lespérance et al., 1996; Dickens et al., 2008). In other

* Correspondence to: Department of Neuroscience, Psychiatry Unit, University of Parma, University Hospital, Braga Building. 43126 Parma, Italy. Fax: +39 0521 396825.
E-mail address: paolo.ossola@unipr.it (P. Ossola).

http://dx.doi.org/10.1016/j.psychres.2015.05.063
0165-1781/

studies, female gender, younger age (Dickens et al., 2008), physical inactivity, abnormal body mass, drinking and smoking (Almeida et al., 2013; Doyle et al., 2014) seem to increase the risk for incident depression, whereas other authors did not find differences between those who developed incident depression and those who did not (Lloyd and Cawley, 1983).

To our knowledge only one study (Lloyd and Cawley, 1983) have evaluated the risk factors for incident depression in patients after their first ACS, whereas the others examined patients with a long lasting history of heart disease (Almeida et al., 2013; Lespérance et al., 1996; Spijkerman et al., 2005a; Dickens et al., 2008).

The importance of recognising ACS patients at risk of developing depression (Lim, 2014) is undeniable. In fact, even though incident depression is expected to be less severe (Freedland et al., 1992) and to remit spontaneously (Brown, 1988), it exerts the most negative effect on cardiac outcome (Carney et al., 2009; de Jonge et al., 2006; Dickens et al., 2008; Parker et al., 2008; Goodman et al., 2008; Zuidersma et al., 2011). Therefore, the identification of risk factor for incident depression, as to aim of this study, is particularly relevant in patients at their first ACS episode.

2. Method

The Local Ethics Committee approved the study protocol and the study was conducted according to the Helsinki Declaration. All the subjects provided informant consent after the study was fully explained.

2.1. Sample

The study sample was selected among patients who were consecutively admitted to the Coronary Intensive Care Unit of the University Hospital of Parma, from January 2009 to March 2012, for an ACS.

All the subjects had no previous or current major depressive episode according DSM-IV (American Psychiatric Association, 1994) and they presented for the first time with symptoms suggestive of an acute coronary syndrome.

Cardiac condition at the enrolment were presenting for the first time with symptoms suggestive of an acute coronary syndrome and in whom a ST-segment elevation myocardial infarction (STEMI), a non-ST-segment elevation myocardial infarction (NSTEMI), or unstable angina had been diagnosed (Van deWerf et al., 2008; Hamm et al., 2011). The working diagnosis of NSTE-ACS was a rule-out diagnosis based on the ECG, i.e. lack of persistent ST elevation. Biomarkers (troponins) further distinguished NSTEMI and unstable angina (Hamm et al., 2011).

Moreover, the inclusion criteria were: (1) age over 18 years; (2) being native Italian speaker or with a proficiency in Italian and not showing cognitive impairment (Mini Mental State Examination (MMSE) >25) (Folstein et al., 1975); (3) no substance abuse or dependence and not taking any psychotropic medication.

2.2. Assessment

All patients underwent the following evaluations at baseline: (1) a brief sociodemographic interview; (2) the Primary Care Evaluation of Mental Disorder (PRIME-MD) (Spitzer et al., 1994); (3) the Hospital Anxiety and Depression Scale (HADS) (Zigmond and Snaith, 1983). At baseline, patients were also interviewed by an expert psychiatry to confirm if the PRIME-MD answers fit their clinical condition and to exclude the presence of previous MD episodes.

The PRIME-MD and the HADS were re-administered to all patients after one, two, four, six and twelve months by the same trained psychiatrist.

The PRIME-MD is a structured interview designed to diagnose mental disorder according DSM-IV. The PRIME-MD evaluates the presence of 9 depressive symptoms in the last two weeks. Each symptom is rated on a four-point scale (from "not at all" to "most days"). Moreover, the PRIME-MD also rates on a four-point scale the difficulty in daily functioning due to the depressive symptoms (from "not at all" to "extremely difficult"). The PRIME-MD has showed good specificity (98%) and sensitivity (73%) in detecting MD in primary care (Spitzer et al., 1999). According to the PRIME-MD, a patient was defined depressed if, at any evaluation time, he/she fulfilled the criteria for a major depressive episode (MD) or a minor depressive episode (md). A patient was defined non-depressed if he or she did not satisfy the criteria for MD or md at any evaluation time during the follow-up period. Patients who had at least one MD or md episode over the follow up (regardless of the number of episodes) were classified, respectively, as MD and md. One patient who developed both MD and md episodes, at different time points, was included in the MD group only.

The HADS is a 14-items self-administered instrument for the evaluation of anxiety and depression in non-psychiatric samples. Each item is rated on a five-point (0–4) scale. The seven items of the depression subscale are largely based on the anhedonic state: in fact, five items are related to the loss of pleasure. The seven items of the anxiety subscale were chosen from the psychic manifestations of anxiety. Therefore, HADS generates two subscale scores: the anxiety score (HADS-A) and the depression score (HADS-D). HADS has been considered more consistent in evaluating depression, containing less somatic symptoms that could be more influenced by health status in ACS patients (Doyle et al., 2006).

One strategy for addressing the issue of potential clinical confounders is to utilize an evidence-based prediction tool to assess mortality risk after acute coronary events (Kronish et al., 2009). The Global Registry of Acute Coronary Events (GRACE) score (Eagle et al., 2004) is based on a risk model of 6 months mortality risk from the time of hospital discharge; it considers age, history of MI, past or current congestive heart failure (CHF), heart rate, systolic blood pressure, serum creatinine, elevated cardiac enzymes, ST-segment depression on ECG at admission, and no in hospital percutaneous intervention (PCI). All the information concerning the abovementioned parameters was obtained from chart review at baseline. The GRACE score ranges between 1 and 263 points. A score of 80 predicts a 1% mortality rate at six months, 100 predicts a 2% mortality rate, and >210 predicts a $>50\%$ mortality rate.

2.3. Treatment

Concerning treatment of depression, patients with depressive symptoms were referred to a psychiatrist and properly treated.

2.4. Statistical analyses

After computing the rates of patients classified as MD, md, and never-depressed over the course of follow-up, the baseline differences among groups were evaluated using Fisher's exact test for categorical variables and one-way ANOVA with Bonferroni correction for continuous variables (i.e. age and HADS).

We then tested in two enter-method logistic regression (dependent variables md and MD vs. no depression) the best predicting model among the socio-demographic and clinical variables, which differed within groups at baseline. Specifically age, gender, being widowed, occupation, GRACE-score, HADS depression and HADS anxiety have been entered as independent variables to evaluate the prediction of the development of a depressive disorder during the follow-up period. We carried out all the analysis using SPSS software (version 21.0, IBM SPSS Statistics).

3. Results

3.1. Patient characteristics

Three-hundred-and-ninety-seven patients met the inclusion criteria, and among them, 377 agreed to participate in the study. During the follow-up period 25 moved outside the study area, 23 refused further psychiatric evaluations, 4 passed away and 21 continued the rehabilitation treatment in a different hospital. The study sample, therefore, included 304 subjects, 245 male (80.6%) and 59 female (19.5%), with a mean age of 61.4 ± 10.9 years (range 32–87 years). Data regarding part of the study sample ($n=250$; follow-up period $=6$ months) has been considered in a previous study (Marchesi et al., 2014a).

3.2. Depressive disorder

Throughout the follow-up period, MD was diagnosed in 15 patients (4.9%) and md in 25 patients (8.2%), whereas 264 (86.8%) did not developed a depressive disorder in the 12 months of follow-up.

More female were found within depressed, both MD and md, than in non-depressed subjects, whereas widowed status, living alone and being a housewife were more frequent in md than in non-depressed subjects (Table 1). GRACE score was significantly higher in the md group than in MD group (Table 1).

3.3. Severity of anxiety and depressive symptoms

At baseline HADS-D score was significantly higher in subjects