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Is denial a maladaptive coping mechanism which prolongs pre-hospital delay in patients with ST-segment elevation myocardial infarction?

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ABSTRACT

Objective: During an acute myocardial infarction, patients often use denial as a coping mechanism which may provide positive mood regulating effects but may also prolong prehospital delay time (PHD). However, empirical evidences are still sparse.

Methods: This cross-sectional study included 533 ST-elevated myocardial infarction (STEMI) patients from the Munich Examination of Delay in Patients Experiencing Acute Myocardial Infarction (MEDEA) study. Data on sociodemographic, clinical and psycho-behavioral characteristics were collected at bedside. The outcome was assessed using the Cardiac Denial of Impact Scale (CDIS) with the median split as cutoff point. A total of 206 (41.8%) STEMI patients were thus classified as deniers.

Results: Deniers were less likely to suffer from major depression ($p = 0.04$), anxiety ($p = 0.01$) and suboptimal well-being ($p = 0.01$) compared to non-deniers during the last six months prior to STEMI. During STEMI, they were less likely to perceive severe pain strength ($p = 0.04$) and racing heart ($p = 0.02$). Male deniers were also less likely to perceive shortness of breath ($p = 0.03$) and vomiting ($p = 0.01$). Denial was not associated with overall delay time. However, in the time window of 3 to 24 h, denial accounted for roughly 40 min extra delay (356 vs. 316.5 min $p = 0.02$ $n = 196$).

Conclusions: Denial not only contributes to less suffering from acute heart related symptoms and negative affectivity but also leads to a clinically significant delay in the prevalent group.

1. Introduction

Denial has been commonly framed as a psychological mechanism for "ego defense" [1] which individuals unconsciously employ as reaction to the confrontation with an unacceptable threatening and a potentially harmful condition by refusing to perceive or consciously acknowledge the impact of a given threat. In the early decades of psychological theory building, denial was regarded as "immature" [1,2] mainly because subjects with high levels of denial may act maladaptive: rejecting or distorting reality in order to defend against unacceptable impulses. More recently, however, positive aspects of denial as a coping mechanism have been acknowledged by highlighting the provision of psychological protection against the perception and processing of subjectively painful or distressing information [3]. Here, denial may facilitate positive mood regulating effects when facing traumatic events and may enhance resilience in these subjects.

An acute myocardial infarction (AMI) with its traumatizing and life threatening onset [4] may qualify as a condition where denial may serve as a prominent maladaptive coping mechanism [4–6]. Indeed, some small exploratory studies, mainly performed over 10 years ago, provided a preliminary evidence that denial contributes to delayed adherence to effective cardiac treatment by disavowing of the diagnosis and by minimizing the perceived symptom burden and symptom severity [7–9]. However, it is not unlikely that denial also exerts positive effects during the acute stress situation of an AMI. Indeed, one recent study has demonstrated that denial can also help patients to go through stressful somatic disease treatment conditions and react better to the medical treatment [10].

The suspicion that denial may act on the patient's decision to seek adequate help after the onset of an ST-segment-elevation myocardial infarction (STEMI) is of a particular concern because patient's delay in presenting to the hospital promptly after STEMI onset is a major factor limiting the potential of acute reperfusion to further reduce cardiovascular mortality [6]. Denial has the potential to play an important role

Abbreviations: AMI, acute myocardial infarction; STEMI, ST segment elevation myocardial infarction; PHD, Prehospital delay; MEDEA, Munich Examination of Delay in Patients Experiencing Acute Myocardial Infarction.

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in this context. Given the limited evidence on this topic, we aimed to investigate whether a high level of denial exert an independent impact on prolonged delay time during STEMI. Furthermore, we investigate whether denial facilitates a favorable impact on mood regulating conditions (depression, anxiety) and the perceived severity of the STEMI.

2. Methods

The multicenter, retrospective cross-sectional MEDEA study (Munich Examination of Delay in Patients Experiencing Acute Myocardial Infarction) was conceived with the aim to evaluate prehospital delay of STEMI patients, and the factors which may contribute to prolonged delay.

2.1. Study design

The patients were recruited from the university or municipal hospitals, which have a coronary care unit and belong to the Munich emergency system network hospitals (see the acknowledgement). The main inclusion criterion was the diagnosis of STEMI as evidenced by typical clinical symptoms including: chest pain/discomfort lasting for 10–20 min or more (not responding fully to nitroglycerine), radiation of the pain to the neck, lower jaw, or left arm, dyspnea, or syncope [11]; ECG changes and myocardial biomarkers levels [12]. Patients were excluded from the study if they had to be resuscitated, if AMI occurred while already hospitalized and if they were unable to answer the questionnaires properly due to language barriers or cognitive impairment. There were no age restrictions.

Standardized operation procedures (SOPs) were implemented to ensure the consecutive referral of eligible patients into the study.

All patients were informed of the aim and procedures of the study and also that taking part in the study would have no effect on their treatment. All participating patients were required to sign a declaration of consent. Physicians updated MEDEA personnel twice a week on eligible patients. Bed-side interviews were conducted in the hospital ward within 24 h after referral from intensive care.

2.2. Sample

From 12.12.2007 until 31.05.2012, a total of 755 patients were screened for eligibility. In 619 patients, a diagnosis of STEMI was confirmed. As can be seen in Fig. 1, approximately 18% of patients were excluded: 4% due to not meeting inclusion criteria and 14% due to absence of consent. From the 619 eligible patients, a total of 86 patients were excluded because of missing data in the Cardiac Denial of Impact Scale (CDIS). A drop-out analysis was conducted to compare the baseline information between the patients with ($n = 533$) and without ($n = 86$) valid CDIS data. This analysis demonstrated that the CDIS responders were significantly younger ($M_{res} = 61.63$, $M_{non\text{-}res} = 66.53$, $p = 0.001$), better-educated {$N_{res} = 208$ (39.02%), $N_{non\text{-}res} = 48$ (55.81%), $p = 0.003$} and more likely to be employed {$N_{res} = 278$ (52.16%), $N_{non\text{-}res} = 26$ (30.23%), $p = 0.0002$}. No differences in living situation (living alone or not) ($p = 0.15$) and sex ($p = 0.15$) were found between responders and non-responders.

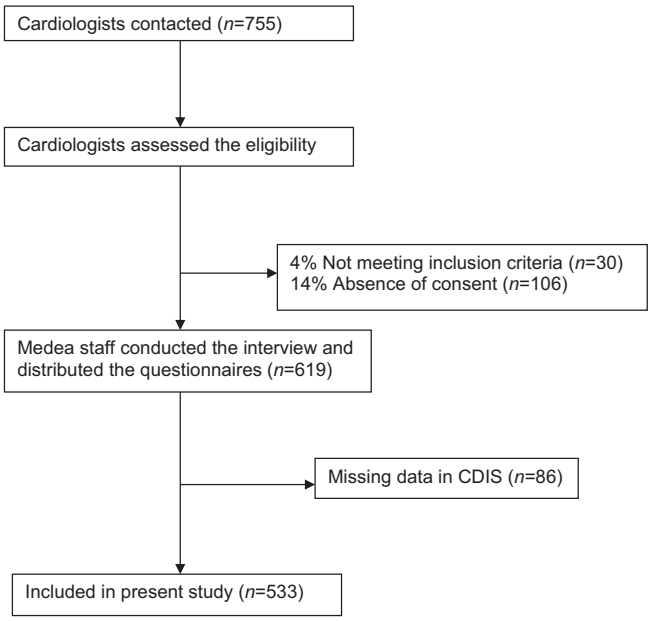

Fig. 1. Consort chart of patients in MEDEA.

2.3. Data collection

The data collection process was divided into three sections. Firstly, a structured bedside interview was conducted with trained personnel. Secondly, a self-administered questionnaire was filled by the patient without supervision. Thirdly, data were collected from the hospitals' patient charts.

The hospital patient charts and bedside interviews provided data on demographic information, like age, sex, living situation (living alone or not), risk factors, presenting symptoms, important clinical measures as well as possible complications. Prodromal symptoms were defined by the presence of any symptom related to coronary artery disease within the last six months prior to STEMI, including prodromal chest pain, dyspnea, sweating, palpitation, faint, sleep disturbance and fatigue.

2.4. Measures

2.4.1. Prehospital delay (PHD)

Patients were asked to recall at what time acute symptoms began. The time difference between symptom onset and first ECG at hospital entry constitutes “prehospital delay” (PHD), measured in minutes. PHD was thus available as a continuous variable which was heavily left-skewed and did not approximate a normal distribution after log-transformations.

2.4.2. Cardiac Denial of Impact Scale (CDIS)

Denial was assessed with the CDIS [13], which originated from the earlier work of Hackett and Cassem [14]. The CDIS is composed of 8 items, rated on a 5-point Likert scale from not present to very high, leading to an overall score ranging from 8 to 40. The test-retest reliability, construct and discriminant validity have been reported by the developers [13] as sufficient.

To define an index study population of deniers, we followed the procedure of earlier investigations which applied the median split as a cut-off point [7,9], leading to a denial (>24) and non-denial (≤24) group. Interestingly, this particular cut off point was identical with the two other studies under consideration [7,9], indicating that the scale is stable across diverse study population.

2.4.3. Psychological measures

Anxiety was assessed with the German version of Generalized Anxiety Disorder scale (GAD-7). It is composed of 7 items, rated on a on a 5-point Likert scale from not present to very high, leading to an overall score ranging from 7 to 35. A GAD-7 score greater than or equal to 10 indicates anxious participants [15].

Depression was assessed with the Major Depression Inventory (MDI) - a self-report mood questionnaire able to generate an ICD-10 or DSM-IV diagnosis of clinical depression. The MDI contains 12 items. According to the DSM-IV definition, patients who had at least five symptoms in the MDI scale, of which at least one must be a ‘core’ symptom, were diagnosed with major depression [16].