

Research report

# Comorbidity of PTSD and depression following myocardial infarction<sup>☆</sup>

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## Abstract

**Background:** This study examines comorbidity of posttraumatic stress disorder (PTSD) and depression following myocardial infarction (MI). It has two aims: (a) to examine whether this comorbidity is predicted by the objective severity of the MI and the patients' initial appraisal and stress responses; and (b) to determine whether this comorbidity is associated with PTSD symptomatology, depression, physiological adjustment, and psychosocial adjustment seven months post-MI.

**Method:** 116 MI patients were examined twice. At Time 1, within a week of the MI, initial appraisal, stress responses, and depressive reactions were assessed, and medical measures were obtained from patients' hospital records. At Time 2, seven months later, PTSD, depression, psychosocial functioning, and physical adjustment were assessed.

**Results:** Seven months post-MI, 16% of the patients were identified with PTSD; 8% with comorbid PTSD and depression; and 14% with high levels of depression without full PTSD. Initial level of depression was associated with comorbidity of PTSD and depression. While initial stress reactions did not predict comorbidity, they did predict depression, with or without comorbid PTSD. Comorbidity of PTSD and depression was associated with higher levels of adjustment difficulties.

**Discussion:** Comorbidity of PTSD and depression has some clinical significance. While initial level of depression predicts subsequent comorbidity of PTSD and depression, early stress reactions do not differentiate between MI patients who suffer from depression, with or without comorbid PTSD.

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**Keywords:** Acute stress disorder (ASD); Posttraumatic stress disorder (PTSD); Depression; Comorbidity; Myocardial infarction (MI)

## 1. Introduction

Myocardial infarction (MI) is a stressful, life threatening experience that entails many losses. In many cases, the threat remains even after the acute MI is over, as patients may develop complications and

recurrent cardiac events (Fowles, 1995), and death rates are high in both the short- and long-term aftermath (Alter et al., 2006; Kaul et al., 2004).

Clinicians and researchers have recognized that MI has psychological consequences. Rates of depression among individuals with coronary heart disease range between 7% and 40% (Lacey et al., 2004; Connerney et al., 2001; Ellis et al., 2005). In the last decade, several researches have observed that MI may also be a risk factor for posttraumatic stress disorder (PTSD), as 8–25% of MI patients suffer from PTSD in the first year

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post-MI (Bennett and Brooke, 1999; Kutz et al., 1994; Shemesh et al., 2004; Ginzburg et al., 2003).

Previous studies recognized that substantial proportions of PTSD casualties, ranging from 21% to 94% (e.g., Mollica et al., 1999; Salcioglu et al., 2003), suffer from depression. The comorbidity of PTSD and depression following MI has not been studied empirically, however. This study focuses on the prediction of comorbidity of PTSD and depression by the severity of the MI and the patients' initial appraisal and stress responses, as well as the clinical implications of this comorbidity following MI.

*Level of exposure* to stress can be measured either objectively (i.e., the severity of physical injury), or subjectively (i.e., the perceived threat of death). The DSM-IV (APA, 1994) identifies level of exposure to the traumatic event as one of the most important risk factors for PTSD, and numerous studies bear out the claim, especially regarding level of perceived threat (e.g., Ehlers et al., 1998).

Fewer studies have been carried out on the relationship between exposure and depression, presenting inconsistent findings (e.g., Wilkeson et al., 2000; Mayou et al., 2001). The relationship between exposure and comorbid PTSD and depression has been examined even less. Kozaric-Kovacic et al. (2001) found that duration of combat experience did not differentiate between PTSD individuals with and without comorbid depression. The association between perceived threat and comorbidity of PTSD and depression has not been studied yet.

Various studies indicated that *initial stress response* predict subsequent PTSD (e.g., Shalev and Freedman, 2005; Shalev et al., 1998). The immediate stress responses seem to be less relevant to the development of subsequent depression (Mayou et al., 2001; Salcioglu et al., 2003).

Examining the role of initial stress responses in predicting the comorbidity of PTSD and depression, Shalev et al. (1998) found that levels of intrusion, avoidance, and depression one week after the event did not differentiate between PTSD individuals with and without comorbid depression four months later, and were higher than among those who developed only depression.

Studies of the *clinical implications* of PTSD, show that it may be implicated in somatic complaints (Ladwig et al., 1999), impaired health-related quality of life (Michaels et al., 1999), referrals to hospital emergency rooms (Kutz et al., 1994), and difficulties in occupational (Kutz et al., 1994), social (Solomon, 1993), and familial (Jordan et al., 1992) functioning. Similarly, high levels of depression are associated with difficulties in psychosocial adjustment (Drory et al., 1999), increased

hospitalization and mortality among cardiac patients (Burg et al., 2003).

The clinical implications of comorbidity of PTSD and depression are still unclear, however. Several studies suggest that comorbidity complicates the trauma survivors' adjustment. These show that PTSD sufferers with comorbid depression show more severe PTSD (Maes et al., 2000), depression (Kozaric-Kovacic et al., 2001), and difficulties in psychosocial adjustment (Momartin et al., 2004), than PTSD sufferers without comorbid depression. Studies also show that persons with comorbid PTSD and depression generally have higher levels of PTSD (Constans et al., 1997) and depression (Holtzheimer et al., 2005), and more difficulties in physical adjustment (Frayne et al., 2005) than persons who suffer from depression without PTSD. On the other hand, a number of studies seem to suggest that comorbidity of the two disorders does not have substantial clinical implications (Solomon and Bleich, 1998; Labbate et al., 2004).

The present study examines these issues prospectively among MI patients. More specifically, it assesses MI patients during hospitalization (Time 1) and seven months later (Time 2) in order:

1. to determine whether the objective severity of the MI and the patients' initial appraisal and stress responses as measured at Time 1 predict comorbidity of PTSD and depression at Time 2, and
2. to determine whether comorbidity of PTSD and depression are related to the number of PTSD symptoms, depression, physiological adjustment and level of psychosocial adjustment at Time 2.

## 2. Methods

### 2.1. Subjects and procedure

The subjects were 116 MI patients, drawn from all the patients who were admitted to the cardiac intensive care unit in three medical centers during the data collection and met the following criteria: (a) presence of the MI diagnostic criteria — typical clinical symptomatology, ECG evidence of MI, and typically elevated serum levels of myocardial enzymes; (b) age up to 70 years; (c) Hebrew speaking; and (d) not suffering from any other major illness. In all, 245 patients met the criteria. Of these, 196 were assessed during their hospitalization (Time 1;  $M=3.45$ ,  $SD=2.32$  days after admission; Response rate=80%). The second assessment (Time 2) was conducted in the patients' homes around seven months after their admission ( $M=7.06$ ,  $SD=2.32$  months). Four of the patients who participated in Time 1 died before the

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