Research Article

Does Illness Perception Predict Posttraumatic Stress Disorder in Patients with Myocardial Infarction?

Hastalık Algısı Myokard İnfarktüsü Geçiren Hastalarda Travma Sonrası Stres Bozukluğunu Öngörebilir mi?

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ABSTRACT

Introduction: Myocardial infarction (MI) as a life-threatening event, carrying high risk of recurrence and chronic disabling complications, increases the risk of developing acute stress disorder (ASD), posttraumatic stress disorder (PTSD), or both. The aim of this study was to investigate the relationship between illness perceptions and having ASD, PTSD, or both in patients after MI.

Method: Seventy-six patients diagnosed with acute MI were enrolled into our prospective study. We evaluated patients during the first week and six months after MI. Patients were assessed by using the Clinician Administered PTSD Scale (CAPS), the Hamilton Depression Rating Scale (HDRS), the Hamilton Anxiety Rating Scale (HARS), the Brief Illness Perception Questionnaire (BIPQ), and a semi-structured interview for socio-demographic characterics during both the first and second evaluations.

Results: Acute stress disorder (ASD) developed in 9.2% of patients and PTSD developed in 11.9% of patients with MI. Illness perception factors of 'consequences, identity and concern' predicted the occurrence of both ASD and PTSD, whereas 'emotion' predicted only PTSD.

Conclusion: The factors of illness perceptions predicted the induction of ASD and PTSD in patients who had acute MI. *(Archives of Neuropsychiatry 2014; 51: 103-109)*

Key words: Acute stress disorder, illness perception, myocardial infarction, posttraumatic stress disorder

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ÖZET

Giriş: Myokard infarktüsü (Mİ), akut stres bozukluğu (ASB), travma sonrası stres bozukluğu (TSSB) veya ikisinin birlikte gelişmesine yol açabilen, tekrarlama olasılığı yüksek ve kronik yeti yitim kaybı yapabilen, hayatı tehdit eden bir olaydır. Çalışmamız Mİ sonrası ASB, TSSB veya ikisini birden tanı alanlarla hastalık algısı arasındaki ilişkiyi araştırmaktadır.

Yöntem: Prospektif çalışmamıza akut Mİ geçirmiş 76 hasta alınmıştır. Hastalar Mİ sonrası ilk hafta ve altıncı ayda değerlendirilmişlerdir. Değerlendirme ölçekleri olarak Klinisyen Tarafından Uygulanan Travma Sonrası Stres Bozukluğu Ölçeği (TSSB-Ö), Hamilton Depresyon Değerlendirme Ölçeği (HDDÖ), Hamilton Anksiyete Değerlendirme Ölçeği (HADÖ), Kısa Hastalık Algısı Ölçeği ve sosyodemografik özellikler için yarı yapılandırılmış görüşme çizelgesi uygulanmıştır.

Bulgular: Miyokard infarktüsü sonrası %9,2 hastada ASB, %11,9 hastada TSSB gelişmiştir. Hastalık algısı faktörlerinden 'önem, tanımlama ve kaygı' faktörlerinin ASB ve TSSB gelişmesinde, 'duygu' faktörünün ise yalnız TSSB gelişmesinde belirleyici oldukları bulundu.

Sonuç: Miyokard infarktüsü geçiren hastalarda, ASB ve TSSB gelişmesinde hastalık algısı faktörleri belirleyicidir. *(Nöropsikiyatri Arşivi 2014; 51: 103-109)*

Anahtar kelimeler: Akut stres bozukluğu, hastalık algısı, miyokard infarktüsü, travma sonrası stres bozukluğu

Çıkar çatışması: Yazarlar bu makale ile ilgili olarak herhangi bir çıkar çatışması bildirmemişlerdir.

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Introduction

Myocardial infarction (MI) due to atherosclerosis is one of the most common causes of death in the developed countries. Patients with MI may develop complications, recurrent cardiac events, or both; as a result, death rates are high in both the short-term and the long-term (1).

Posttraumatic stress disorder (PTSD) is an anxiety disorder that occurs after experiencing an event that involved the threat of death or serious injury characterised by the re-experience of the traumatic event, increased arousal and the avoidance of stimuli-associated trauma (2). MI is a sudden and life-threatening event that may evoke feelings of fear and loss of control, thus, it is both a physically and psychologically traumatic event, a criterion of traumatic distress in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), and might induce PTSD (3). PTSD is distinguished from acute stress disorder (ASD) by its shorter symptom durations and dissociative symptoms (2). PTSD occurs after MI more frequently than other medical diagnoses (4,5). In recent studies, approximately 4%-18% of patients with MI reported substantial ASD symptoms, whereas 0%-32% reported PTSD symptoms (6,7,8,9,10,11,12,13,14,15).

Patients' beliefs and perceptions concerning their illness may affect MI recovery (16). Many recent studies have investigated patients' beliefs or perceptions regarding their illness using Leventhal's self-regulatory model (17). This model starts with the premise that people are active problem solvers who process a threat to their health, such as a symptom or an illness, by developing their own cognitive representation of that threat, which determines how they will respond. There is now a convergence of evidence showing that these representations consist of five distinct but interrelated components that define the nature of the health threat for people. These five components are beliefs about (a) the causes of the illness; (b) identity (i. e., symptoms that the patient associates with the illness); (c) the consequences of the illness; (d) time line (i. e., how long the patient believes the illness will last); and (e) ways to control or cure the illness. Together, these beliefs form an illness schema that determines patient coping (e. g., adhering (or not) to medical advice) (16). Changing patients' illness perceptions improves recovery following MIs (17).

In the literature, though there are some studies in which illness perceptions of patients have been investigated during or after MI, a limited number of studies showed the relationship between illness perception and psychiatric diseases, particularly PTSD. The hypothesis of this study was that illness perceptions of patients may predict the development of ASD and/or PTSD during MI recovery.

Methods

Participants

Patients with acute and initial MIs, who were admitted to the intensive care unit, were enrolled in our prospective study. We recruited all patients from the Cardiology Department at the İstanbul Faculty of Medicine between September 2005 and December 2006. A trained research psychiatrist administered all clinical ratings during a single, face-to-face interview.

We evaluated the patients during the first week (range=2-7 days) as well as six months after the MI. We defined acute MI as the atypical increase and decrease of biochemical markers of myocardial necrosis (twice the normal level of CK-MB (380 U/L) or troponin (4 g/L)) with at least one of the following: (1) ischemic symptoms; (2) the development of pathologic electrocardiogram Q-waves; (3) electrocardiogram changes indicative of ischemia (ST segment elevation or depression); or (4) coronary artery intervention (e. g., coronary angioplasty). We excluded patients with history of previous MIs, those suffering from another major illness, and those with a psychotic disorder, mental retardation or cognitive impairment from this study. We admitted 120 patients from the Coronary Intensive Care Unit. Twenty-eight patients did not meet our inclusion criteria. After verifying an acute MI diagnosis, we approached 92 patients about enrolling in our study. Seventy-six patients agreed to take part in the study. The response rate was 82%. At the sixth month, 59 patients had been evaluated, 2 patients could not be reached due to death. All patients provided written informed consent and the local institutional scientific committee approved this study.

We administered thrombolytics, other anti-ischemic agents, or both to participants. The major anti-ischemic treatment modality was percutaneous transluminal coronary angioplasty (PTCA), which was applied to 39 patients (51%).

Measurements

A semi-structured interview form collected socio-demographic characteristics as well as patient perceptions and other features of patients related to MI. We collected other demographic (age and sex), echocardiographic (left ventricular ejection fraction), electrocardiographic and biochemical (serum troponin, CK, C-reactive protein) data from patient medical records.

The validated Turkish versions of the 17-item Hamilton Depression Rating Scale (HDRS) and the Hamilton Anxiety Rating Scale (HARS) evaluated depressive and anxiety symptoms, respectively (18,19,20,21).

We used the validated Turkish version of the Clinician-Administered PTSD Scale (CAPS), a structured psychometric interview, to diagnose PTSD according to the DSM-IV (22,23). The Turkish version shows sufficient internal consistency for the severity scores of all 17 symptom items (Cronbach's α=0.91) and the 3 PTSD symptom clusters (α=.78-α=.82). The CAPS measures 17 PTSD symptoms. The frequency and intensity of each of these symptoms are quantified on a 5-point scale that ranges from "never" (0) to "almost always" (4 points). A particular symptom is present when its corresponding item has a frequency score of at least 1 and an intensity score of at least 2. To meet the diagnostic criteria of a particular symptom cluster, Criterion B (the re-experiencing subscale) requires the presence of 1of 5 symptoms, Criterion C (the avoidance subscale) requires the presence of 3 of 7 symptoms, and Criterion D (the hyperarousal subscale) requires the presence of 2 of 5 symptoms. The total score can range from 0 to 136.

The validated brief illness perception questionnaire (IPQ-B) has eight new items as well as a portion of the causal scale previously used in the IPQ-R. There is no Turkish validation of

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IPQ-B. It was translated into Turkish by three psychiatrist and also retranslated into English by different three psychiatrist. We applied IPQ-B form on ten patients and confirmed comprehensibility of the form. All items except the causal question were rated using a response scale that ranges from 0 to 10. Five items assess cognitive illness representations: consequences (How much does your illness affect your life?); identity (How often do you experience illness symptoms?); timeline (How long do you think your illness will continue?); personal control (How much control do you feel you have over your illness?); and treatment control (How much do you think your treatment can help your illness?). The IPQ-B assesses the emotional representations of illness with items, such as concern (How concerned are you about your illness?) and emotions (How much does your illness emotionally affect you?). Finally, this scale assesses illness understanding with an item on illness "comprehensibility" (How well do you feel you understand your illness?) (17).

Statistical Analyses

We used the SPSS 13.0 statistical software package (SPSS, Inc., Chicago, USA). All tests were two-tailed with significance level set at P less than .05. At ordinal variability, descriptive and frequency measurements were conducted. Differences between two grouping variables were calculated using the Student's t-test, Pearson's chi-square test, and Fisher's exact test where appropriate.

Results

Demographic Characteristics

We included 76 patients (60 males and 16 females) in this prospective study. The mean age of the patients was 54 yrs (SD+10.7) (range=26-77 yrs). Table 1 lists patients' socio-demographic and disease characteristics (Table 1). Forty-nine male and 10 female patients completed the second interview. The mean age of the patients was 51.5 yrs (SD+9.93). Socio-demographic characteristics of patients who completed the first interview were found to be similar with those of patients who completed both the first and second interviews.

Disease Characteristics

We observed that the frequency of ASD and PTSD in patients with MI was 9.2% and 11.9%, respectively..

PTSD occurred in 42% of patients with ASD. The symptoms and signs of other ASD patients disappeared. The mean scores of the sample were: CAPS total=11.7, CAPS intrusion=3.8, CAPS avoiding=2.4, CAPS increased arousal=4.1, HDRS=6.0 and HARS=9.8.

Variables Associated with an ASD Diagnosis

Patients with ASD were more likely to be women (p=.01), expect death (p=.33), perceive their illness as a life-threatening event (p=.001), feel helpless (p=.02) and terrified (p=.002) compared to those without ASD. In addition, these patients had higher CAPS total, CAPS intrusion, CAPS avoiding, CAPS increased arousal and HARS scores compared to those without ASD. CAPS intrusion was the highest score among patients with ASD (Table 2).

Variables Associated with a PTSD Diagnosis

Patients with PTSD were more likely to be single when they had an MI (p=.01), have more difficulties during transportation to the hospital (p<.001), and feel threatened by death (p=.008), helplessness (p=.02) and horror (p=.018) compared to those without PTSD. PTSD significantly affected patients' sexual lives: Sexual reluctance and sexual avoidance were present whereas sexual enjoyment decreased (p=.01). CAPS total (p<.001), CAPS intrusion (p<.001), CAPS avoiding (p<.001), CAPS increased arousal (p<.001), HDRS (p=.018), and HARS (p=.01) scoreswere significantly higher in patients with PTSD compared to those in patients without PTSD. In addition, CAPS intrusion was the highest score among patients with PTSD (Table 2).

Illness Perception

The illness perception factors of consequences (p=.01), identity (p<.001), concern (p<.001) and emotions (p=.01) were positively correlated with a PTSD diagnosis. Consequences (p=.02), identity (p<.001) and concern (p<.001) were also positively correlated with an ASD diagnosis (Table 3). Thus, patients with ASD and those with PTSD shared beliefs regarding the consequences, identity and concerns related to MI.

There were 4 (5%) patients with high (≥13) HDRS scores at the first assessment and 8 (13%) patients with high HDRS scores at the second assessment. There was no ASD in any patient who had high depression scores at the first assessment, however, in patients with high HDRS scores, personal control negatively (p=.003) and identity positively (p<.001) correlated with high depression scores. PTSD was diagnosed in 62% (5 patients) of patients who had high depression scores. The consequences (p<.001), timeline (p=.03), identity (p=.001), concern (p<.001) and emotions (p=.007) positively correlated with depression scores in patients with high depression scores (Table 4).

Discussion

Psychological reactions to physical illnesses are a normal course of development (11,24). Mental disorders that develop after medical illnesses are usually ignored. This lack of treatment can lead to chronic mental disorders. Patients with PTSD following stroke, MI or both may be underlooked (25). Although some studies state that the frequency of PTSD following an MI ranges from 0% to 32%, this range is typically 10%-20% in most studies (26,27). Thus, the frequency of PTSD in the present study is in accordance with previous studies (10,14,28,29).

In addition, few studies have investigated the frequency of ASD in patients with MI (6,7,8). We found that the frequency of ASD was 9.2% (n=7), which is parallel to that provided range? (6,7,8). A recently reported study has shown that patients believe the MI will have more serious and long-lasting consequences (30). Reduced quality of life, reduced lifestyle modification, reduced cardiac rehabilitation attendance, more medical complications and slower return to work have been found to be correlated with negative illness perceptions after a cardiac event (31,32).

Few studies have used both illness perception and trauma scales in patients with MIs (33). The patients that were diagnosed with PTSD in the present study reported that they were physically affected by the illness (consequences), experienced illness

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Table 1. Patient characteristics		
	n (n=76)	(%)
Age (yrs + SD)	53.5+10.7	
Sex		
Male	60	79
Female	16	21
Marital Status		
Married	66	87
Unmarried	10	13
Employment status		
Working	43	57
Retired	15	20
Unemployed	18	23
Habitation		
Living with family/friend	76	100
Living alone	0	0
Educational History (years + SD)		
Only literate	14	18
Primary school	35	46
Secondary school	5	7
High school	15	20
University	7	9
Cardiovascular Risk Factors		
Hypertension	21	28
Diabetes mellitus	20	26
Family history	53	70
Current smoker	48	63
Hyperlipidaemia	15	20
Treatment		
PTCA	39	51
PTCA absent	37	49
During attack		
Alone	14	18
With someone	62	82
Arriving to hospital		
Immediately	64	79
Not immediately	12	21
Data are provided as means ± standard deviations		

symptoms (identity), worried about their illness (concern), and were emotionally affected by the illness (emotions). The reports of patients who suffered an acute MI or a subarachnoid haemorrhage (SAH) support the findings showing that a PTSD diagnosis was proportionally related to the expression of illness perception factors, such as consequences, identity, timeline (acute/chronic) and emotions) (33). Alternatively, the present study found that the concern factor was more pronounced in patients with PTSD compared to those without PTSD.

Patients with ASD, like those with PTSD, reported that they were consequences of illness, experienced illness symptoms (identity), and concern about illness. Our results suggest that higher scores of consequences, identity and concern increase the risk of PTSD in patients who have had an MI. Patients with ASD might not be able to evaluate their emotions in the early stages of their illness, however, they gain this ability over time.

Recent studies have found that four illness perception items (identity, cure/control, consequences, and coherence) significantly predicted attendance at cardiac rehabilitation (16). Alsen et al. showed that illness perception 4 months after an MI changed over time; specifically, patients perceived their illnesses as chronic more frequently than during its acute phase (34). In our study, the expectations of the timeline of acute or chronic illnesses were high for all patients but especially for those with PTSD, although this did not reach statistical significance.

More negative consequence attributions, poor understanding of the illness and lower control beliefs have been shown to predict depression, an indicator of poor recovery following a cardiac event (32,35,36,37). In our patients, who had high depression scores, perception of their lives influenced by illness critically (consequences) (30,32,38), longer duration of illness (timeline) (38), and low personal control (37,39) were consistent with previous studies. However, in patients, who had depression after MI, the disease which stimulated depression may lead to changes in the perceptions, such as feeling difficulties/symptoms related to illness (identity), worrying about their illness (concern), and emotionally affected by illness (emotions). The similar illness perception items in patients with PTSD and high depression scores at the second assessment may be due to overlapping of PTSD and depression cases. To understand which psychiatric factor affects illness perception, comparison in greater number of patients with only PTSD or depression should be done.

Patients with PTSD scored highest on the intrusion and avoidance CAPS subscales. This finding is consistent with previous studies (11,40,41). The high intrusion symptom scores might be explained by increases in patient concerns as well as constant reminders from family members and significant others about their physical health. Some studies indicate that avoidance is a more frequent symptom than re-experiencing trauma (10,28,42). Based on our findings, fear of stress and avoidance may have been more common symptoms because patients who have MIs try to avoid stress and MI-causal behaviours.

Subjective perceptions of a heart attack are more important in predicting PTSD symptoms than objective measures of the MI severity (7,14,43,44,45). Our study also shows that the severity of cardiac systolic dysfunction and its treatment modalities did not affect the development of ASD or PTSD.

Feelings of helplessness, being near death and horror increase the risk of PTSD (2). In the present study, patients

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Table 2. Psychiatric evaluations

	ASD			PTSD		
	Absent Mean±SD	Present Mean±SD	p-value	Absent Mean±SD	Present Mean±SD	p-value
CAPS total	7.7±13.92	63±8.32	<.001*	5.1±6.86	60.42±21.35	<.001*
CAPS intrusion	3.31±4.63	22.14±4.41	<.001*	2.3±3.2	18.85±7.01	<.001*
CAPS avoidance	1.57±4.12	16.7±1.88	<.001*	0.71±1.48	16.85±5.01	<.001*
CAPS hyperarousal	2.08±4.30	15.14±3.53	<.001*	1.96±2.48	17.14±5.01	<.001*
HDRS	5.1±9.12	8.2±2.21	.05	5.1±3.95	14.14±7.22	.015*
HARS	9.0±6.51	16.28±3.35	.005 *	8.73±5.59	17.85±6.64	.01 *
Ejection fraction %	46.1±11.09	46.3±6.37	.97	46.8±11.22	45±7.83	.60

CAPS: Clinician-Administered PTSD Scale; HDRS: Hamilton Depression Rating Scale; HARS: Hamilton Anxiety Rating Scale; Data are provided as means + standard deviations; * p<.05

Table 3. Illness perceptions of patients with or without ASD and PTSD after MI

	ASD			PTSD		
	Absent Mean±SD	Present Mean±SD	p-value	Absent Mean±SD	Present Mean±SD	p-value
1. Consequences (Illness critically influenced their lives)	5.42±2.67	7.71±2.05	.02*	4.40±2.89	7.2±1.3	.01*
2. Timeline (The belief of how long the illness will last)	5.56±3.85	6.71±3.59	.44	6.19±3.69	7.42±1.90	.39
3. Personal control (Control over the illness)	6.86±2.70	6.57±2.57	.77	6.78±2.80	6.57±1.71	.78
4. Treatment control (Control over the treatment)	8.75±2	8.85±1.57	.87	9.44±1.36	8.85±2.60	.58
5. Identity (Difficulties/symptoms related to the illness)	1.04±2.35	4.85±2.26	.001*	1.80±2.61	7.14±2.26	.001*
6. Concern (Worry about their illness)	3.34±3.40	7.28±2.05	.001*	2.57±2.47	8.00±1.73	.001*
7. Comprehensibility (Illness understanding)	5.88±3.25	5.28±2.81	.61	7.38±2.49	6.00±2.82	.17
8. Emotions (The illness emotionally affected patients)	2.37±2.99	4.28±3.86	.24	2.63±2.52	7.14±2.34	.01*

ASD: Acute stress disorder; PTSD: Posttraumatic stress disorder; Data are provided as means + standard deviations; * p<.05

with PTSD reported experiencing all three of these feelings. However, patients without PTSD experienced the same feelings. These findings are in accordance with studies that propose that perceived threats of death are significant factors in patients with ASD and those with PTSD (7,14). In addition, patients whose hospital transport was difficult and who experienced MIs alone are more likely to have PTSD because they have less control with regard to MI, stronger perceptions of immediate threat, and a longer duration of pain (7,14,43,44,46).

Since there is no Turkish validation of IPQ-B, we preferred a brief form of the illness perception questionnaire? IPQ-B zaten brief form değil mi? due to appling it to the intensive care units patients. The comparison of diagnosis frequency in the first and second interviews was not adequate because of the absence of some patients in the second interview, thus, the lack of evaluation of their ultimate diagnosis and condition. Due to the limited number of patients in the sample, it is proposed that studies with larger sample sizes should be conducted in order to get more exact results.

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Table 4. Illness perceptions of patients related with HDRS after MI

	1st asssesment			2nd assesment		
	High ** HDRS	Low HDRS	p-value	High HDRS	Low HDRS	p-value
	Mean±SD	Mean±SD		Mean±SD	Mean±SD	
1. Consequences	6.7±1.7	5.5±.3	.33	8.2±.4	4.1±.37	<.001*
2. Timeline	7.75±1.3	5.5±.45	.21	8.6±.68	5.9±.5	.03*
3. Personal control	2±1.2	7.1±.28	.003*	5.4±.8	7±.38	.07
4. Treatment control	7±1.2	8.8±.2	.06	8.5±.88	9.5±.17	.30
5. Identity	6.7±1.37	1.1±.2	<.001*	5.6±1	1.86±.38	.001*
6. Concern	4±2.3	3.6±.4	.99	6.6±.78	2.6±.37	<.001*
7. Comprehensibility	4.5±1.6	5.9±.37	.47	5.5±.68	7.5±.35	.02
8. Emotions	1.7±1.03	2.5±.3	.72	5.6±.9	2.7±.38	.007*

HDRS: Hamilton Depression Rating Scale, **high HDRS>12; Data are provided as means ± standard deviations; * p<.05

Although a minority of patients with MI are diagnosed with PTSD, clinicians should check whether PTSD is present and (if so) treat these patients to prevent an increased risk of death. Illness perception factors such as consequences, identity and concern predict the progression of both ASD and PTSD, whereas 'emotion' predicted only PTSD in patients who had MIs.

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