

Psychiatric Comorbidity in Patients with Chest Pain without a Cardiac Etiology

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Abstract: *Objective:* Throughout the world and among different cultural groups, physical symptoms are the most common expressions of social problems and distress; chest pain is one of the most widely seen, medically unexplained physical symptoms. Most of the time, chest pain cases in which an organic etiology cannot be determined over time and in those presenting with atypical features should be evaluated as a component or an accompanying symptom of various specific psychiatric disorders, primarily such as panic disorder and depression. The aim of this study was to determine the psychiatric comorbidity rate in patients with chest pain without a cardiac etiology. *Method:* Seventy patients admitted to the cardiology clinic with a complaint of chest pain but without any detectable cardiac etiology were included in the study. All patients were evaluated using a Sociodemographic Data Collection Form and Structured Clinical Interview for DSM-IV. *Results:* Panic disorder was diagnosed in 47.1% of the non-cardiac chest pain group, depressive disorders in 21.4%, generalized anxiety disorder in 5.7%, anxiety disorders not otherwise specified in 5.7%, obsessive compulsive disorder in 5.7%, and undifferentiated somatoform disorder in 2.9%. Two psychiatric diagnoses were established in 12.9% of the patients and no psychiatric diagnosis in 24.3%. *Conclusion:* Psychiatric disorder rates are quite high in patients with chest pain that cannot be explained cardiologically. These results show the importance of psychiatric evaluations in patients with non-cardiac chest pain or unexplained chest pain (UCP). In addition, understanding the psychiatric symptom profile of these patients will make an important contribution to the treatment of non-cardiac chest pain.

Introduction

Worldwide and among different cultural groups, bodily symptoms are the most common individual expressions of social problems and emotional distress (1). Chest pain as a bodily symptom unexplained medically is frequently seen in people seeking treatment at first and second step health institutions (2). Over 50% of patients with chest pain are diagnosed by cardiologists with chest pain unrelated to the cardiac system. Non-cardiac or unexplained chest pain (UCP) can be defined as recurrent angina-like or substernal chest pain thought to be unrelated to the heart after a reasonable cardiac evaluation (2–8). Only one-third of patients with chest pain are diagnosed with ischemic heart disease (2). Some 10% to 30% of patients who experienced cardiac catheterization due to angina-like symptoms are found to have normal coronary arteries. In most of

these patients, chest pain continues and they frequently come to the emergency department and their heart catheterization is repeated (9). Although the medical prognosis of UCP patients is good, these patients do not function well. The unexplained chest pain is persistent; it causes long-term physical limitations, and negatively affects daily activities (4). Chest pain is persistent in 50% to 70% of UCP patients, and 19% to 51% of the patients experience occupational losses, and 40% to 100% experience functional losses. They are exposed to increased rates of medical interventions, including high rates of hospitalization and inappropriate cardiac drug intake (6, 10, 11). Most of the time, chest pain cases in which an organic etiology cannot be determined over time and those presenting with atypical features should be evaluated as a component or an accompanying symptom of various specific psychiatric disorders.

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ders, primarily such as panic disorder and depression (2, 12–17).

Worrying about cardiac disease is the most common belief reported by patients with both generalized anxiety disorder and panic disorder. It is not at all surprising to note that most patients admitted with chest pain and palpitation describe physical symptoms of anxiety. Panic is the exact cause of chest pain and palpitation, but this is only one of the various psychological reasons associated with the etiology of these symptoms (3).

After anxiety neurosis was described by Freud and panic disorder was classified in a separate category in DSM-III, characteristic symptoms of anxiety began to be considered functional or “neurotic medical conditions.” The diagnosis and definition of anxiety disorders as well as subsequent symptom classification in ICD and DSM have had a major impact on the diagnosis and management of symptoms associated with chest pain in primary care and general hospital departments. Chest pain presenting as a nonspecific, medically unexplained symptom has become the most important management issue in both primary care and hospital settings (3).

In a recent study of 167 patients with chest pain not associated with cardiac disease, 41.3% of the patients had panic disorder, 6.6% had a specific phobia, 9.0% had a social phobia, 6.0% had generalized anxiety disorder, 1.2% had miscellaneous anxiety disorder, 7.2% had major depressive disorder, 3.6% had dysthymic disorder, 1.2% had miscellaneous depressive disorders, 18.6% had somatoform disorder, 3.0% had hypochondriasis, and 2.4% had alcohol abuse (18).

Panic disorder is frequently accompanied by concomitant psychiatric disorders. Chest pain accompanying panic disorder commonly coexists with depression, hypochondriasis and other somatoform disorders. It is rather difficult to confirm the diagnosis in somatoform disorders like hypochondriasis (19). Explaining the psychological origin of the symptoms is the major problem for most patients. Associating the symptoms with too many causes and providing ambiguous advice are among the most frequent iatrogenic errors (3). The significance of catastrophic misinterpretation in panic etiology has been emphasized in new theoretical formulations and appears clearly different than hypochondriac

cognition. The heart rate changes during panic attacks and there is an extreme increase in cardiac awareness in the patient suffering an attack. Misinterpretation of cardiac disease and abnormal awareness are the two factors associated with poor prognosis (3).

While intractable chest pain can be associated with anxiety disorders, depression or somatoform disorders, it may not be given any psychiatric diagnosis (20). Panic disorder often coexists in primary care and in those patients admitted to cardiology and in those with a normal coronary angiogram (3).

The aim of this study was to determine the psychiatric comorbidity rate in patients suffering from chest pain without a cardiac etiology.

Methods

Sample

The patient sample group was selected from 308 patients who were admitted to Karadeniz Technical University, Faculty of Medicine, cardiology outpatient department with chest pain between March 1st, 2004 and December 31st, 2004. Based on the cardiological examination and cardiac status, no organic etiology to explain chest pain was detected in any of the patients. Out of these, 112 patients were informed about the aim and scope of the study and 93 subjects between 18 and 65 years of age agreed to participate by signing the informed consent form. Patients with a current psychotic disorder or dementia, or those with any history of psychiatric disorder, psychotropic drug use or analgesic abuse were excluded. The study was approved by the local ethical committee.

Materials

Sociodemographic Data Collection Form: Patients were asked to complete a form including questions on their age, education, sex, marital status, socioeconomic status, symptom duration, presence of any other medical disorders, family history of psychiatric disorder, and type and duration of drugs previously or currently used.

Structured Clinical Interview for DSM-IV: The Structured Clinical Interview for DSM-IV (SCID-I) was developed in 1987, in order to diagnose DSM-III-R

Axis I disorders by a structured clinical evaluation (21). It was subsequently updated for DSM-IV (22). The updated version for DSM-IV was used in this study. The interview begins with a semi-structured part by which demographic information and clinical history are obtained. Then comes the diagnostic modules developed for seven distinct groups of diagnoses, namely affective disorders, psychotic disorders, substance abuse, anxiety disorders, somatoform disorders, eating disorders and adjustment disorders. The interview may last for 1 hour in individuals with no symptoms, whereas it may last up to 3 hours in patients with severe symptoms. Although the main purpose is to evaluate psychiatric patients, it may be utilized in healthy groups as well. Reliability data for SCID have revealed that reliability is higher in severe disorders (i.e., bipolar I disorder, alcohol dependency), compared to mild disorders (i.e., dysthymia). SCID can be utilized to make diagnoses in clinical trials and other psychiatric studies, and to make a systematic evaluation at admission to the hospital for the first time. Turkish versions of DSM-III-R and DSM-IV have been validated previously (23, 24).

Procedures

Seventy patients who sought treatment at the cardiology outpatient clinic of Karadeniz Technical University Medical Faculty for chest pain were included in this study. Bruce or Modified Bruce protocols were employed for all patients with chest pain complaints. A General Electric CASE treadmill exercise stress system was used for the exercise test. Total exercise duration, blood pressure and ST segment changes were recorded during the exercise. The patients were told to report all symptoms during the exercise. Every 3 minutes, they were asked if they had pain or any other symptoms. Pain in the chest or pain spreading to the arm, shoulder or jaw, tightness, pressure, burning or fullness were recorded as chest pain. In the absence of these symptoms, dyspnea, vertigo and tiredness were not regarded as chest pain. Electrocardiography (ECG) traces that were obtained during the procedure were evaluated by two cardiologists who were blind to the study group. Patients with ischemic-type chest pain, or horizontal or downward sloping ST segment changes or decreased blood pressure during the test were consid-

ered positive in terms of ischemia and were excluded from the study. No organic etiology was established in 112 out of the 308 patients with chest pain. All the 112 patients with no organic reason were informed about the study; however, 19 of them refused to participate and 23 were excluded as they did not meet the study criteria. This left a total of 70 patients, who were included in the study as the patient group.

A test battery including the sociodemographic data collection form SCID-I was given to all subjects by a psychiatrist.

Statistical analysis

SPSS Windows 10.0 was used for the statistical analysis of the data acquired in this study. Nominal variables were analyzed by the chi-square test. Student-t test was used for the variables that were normally distributed and Mann-Whitney U test was used for the variables that were not normally distributed. Nominal variables were presented as numbers and percentages, while measured variables were presented as mean and standard deviation. The significance level was set at $p < 0.05$.

Results

Seventy patients in the UCP group completed the study. The sociodemographic characteristics of the study population are shown in Table 1.

Table 1. *The sociodemographic characteristics of the study population [UCP (n=70) (Mean±SD), Age 36.4±10.6]*

		Number (%)
Gender:	Female	34 (48.6%)
	Male	36 (51.4%)
Marital Status:	Married	52 (74.3%)
	Single	18 (25.7%)
	Other	0 (00.0%)
Educational Status:	Primary	32 (45.7%)
	High school	24 (34.3%)
	College	14 (20.0%)
Economic Status:	High	7 (10.0%)
	Moderate	60 (85.7%)
	Low	3 (4.3%)

The psychiatric diagnoses established using SCID-I in the UCP group are presented in Table 2.

Two psychiatric diagnoses were established in 9 patients (12.9%) (Table 3). Seventeen patients (24.3%) were not diagnosed with any psychiatric disorder (Table 2).

Table 2. *Distribution of psychiatric diagnoses among patients with UCP*

Diagnosis	n (%)
Panic disorder	33 (47.1)
Depressive disorder	15 (21.4)
Generalized anxiety disorder	4 (5.7)
Anxiety disorder, unspecified	4 (5.7)
Obsessive Compulsive Disorder	4 (5.7)
Undifferentiated somatoform disorder	2 (2.9)
Not diagnosed	17 (24.3)

Table 3. *Psychiatric co-morbidities in patients with UCP*

Diagnosis	N (%)
Depressive Disorder + Panic Disorder	7 (10.0)
Depressive Disorder + Obsessive Compulsive Disorder	1 (1.42)
Panic Disorder + Obsessive Compulsive Disorder	1 (1.42)

Discussion

Of the patients in the UCP group, panic disorder was found in 47.1%, depressive disorder in 21.4%, generalized anxiety disorder in 5.7%, anxiety disorder unspecified in 5.7%, obsessive compulsive disorder in 5.7%, and undifferentiated somatoform disorder in 2.9%.

The mean age of the UCP group was 36.4 ± 10.6 years. These results are similar to those reported in other studies on patients with UCP (7, 18). Patients with UCP were younger than patients with chest pain of cardiac origin (17). There are numerous reports on the association of chest pain with various psychiatric disorders, particularly panic disorder. Worrying about cardiac disease is the most common reported belief in patients with generalized anxiety disorder and panic disorder. It is not at all surprising

to note that most patients admitted with chest pain and palpitation describe physical symptoms of anxiety. In a study comparing mental disorders in patients with UCP and coronary artery disease patients, a psychiatric disorder was found in 88% of the patients in the UCP group (25). Much evidence associates depression with coronary artery disease and hypertension; 16% of patients assessed seven days after myocardial infarction had symptoms consistent with a major depressive episode (26). Several studies have shown a link between anxiety disorders and coronary heart disease and between anxiety disorders and hypertension (27). Associations between psychiatric morbidity and cardiovascular disease could simply be attributed to patients being psychologically undermined after diagnosis but this does not explain prospective studies showing excess incidence of cardiovascular problems or poorer cardiovascular outcome in patients with depression and anxiety disorders. One study reported a 3.5-fold increase in mortality of depressed patients compared with non-depressed patients within six months of myocardial infarction (26). Depression has been associated with the development of cardiovascular complications in patients with hypertension, and several prospective studies have suggested a link between anxiety disorders and subsequent cardiovascular disease or sudden death (28).

A study in which psychiatric morbidity was evaluated in UCP patients in Turkey revealed panic disorder in 38%, major depression in 28%, dysthymia in 10%, generalized anxiety disorder in 14%, somatoform disorder in 42%, and various other psychiatric diagnoses in 6% of the patients, while 16% had no diagnosis (29).

A recent study of 167 patients with chest pain unrelated to cardiac disease showed that 41.3% of the patients had panic disorder, 6.6% had specific phobia, 9.0% had social phobia, 6.0% had generalized anxiety disorder, 1.2% had anxiety disorder not otherwise specified, 7.2% had major depressive disorder, 3.6% had dysthymic disorder, 1.2% had depressive disorder not otherwise specified, 18.6% had somatoform disorder, 3.0% had hypochondriasis, and 2.4% had alcohol abuse (18).

Panic disorder was the most frequent psychiatric diagnosis, with a prevalence of 47.1%. Chest pain is a key symptom of panic disorder and has been re-

ported as the leading symptom in previous studies. Panic disorder prevalence in acute and chronic chest pain has been reported to be 25% to 60% in cardiology units. It has also been suggested that all patients presenting with chest pain should be evaluated for panic disorder after coronary artery disease has been excluded (8). Panic disorder was found in 22% of the UCP patients in a study conducted in 441 patients who were admitted to the emergency department with chest pain (5). In another investigation of panic disorder in patients with chest pain, panic disorder was found in 41.3% of the 167 patients with chest pain who had no coronary artery disease (30). It has also been reported that most of these patients have remained in on-going cardiac evaluation, have continued to use emergency departments, and panic disorder has remained undetected and untreated in most of the cases. Seven out of 33 panic disorder patients in this study had a concomitant diagnosis of depressive disorder (21.2%), and one had obsessive compulsive disorder (3%). This proportion has been found to be 24.5% in another study and obsessive compulsive disorder has been reported to accompany panic disorder in 10.7% (31). In a different study investigating psychiatric morbidity in UCP, panic disorder and depression were the most prevalent co-morbidities (32).

Depressive disorder, the second most frequent diagnosis, was found in 21.4% of the patients. Somatic symptoms frequently accompany major depression and chest pain is one of them. The negative and pessimistic cognitive schema of depressive individuals is said to strengthen their disease-related memories, make them develop negative thoughts about their health, and make them more preoccupied with their bodies (12). A significant role of depression in UCP has been demonstrated in other similar studies (18, 25). One of the patients with depressive disorder was diagnosed with co-morbid obsessive compulsive disorder. In a recent study, the co-morbid obsessive compulsive disorder prevalence was found to be 13.4% in 1,376 patients with depression (29).

Our study has some limitations. The small number of subjects and the cross-sectional design are the major limitations. A more comprehensive follow-up study, including psychiatric evaluation and support, could give valuable information on the relation between UCP and psychiatric disorders.

Despite these limitations, this study adds to the literature on UCP in several important ways. The present study confirmed the association between UCP and depression and anxiety. The present study also adds to the literature by demonstrating an association between UCP and psychiatric disorders. The pathophysiology of these unexplained pain syndromes is not clear, but they are associated with exposure to traumatic life experiences. A multidisciplinary approach to the treatment of these unexplained pain syndromes has been advocated, and medications or cognitive behavioral therapy targeting psychiatric symptoms have also shown some efficacy.

In summary, psychiatric disorder rates are quite high in patients with chest pain that cannot be explained cardiologically (33–37). These results show the importance of psychiatric evaluations in non-cardiac chest pain or UCP patients. In addition, understanding the psychiatric symptom profile of these patients will make an important contribution to non-cardiac chest pain treatment. Based on the results of this study, clinicians treating patients with frequent UCP should consider the possibility of unrecognized psychiatric comorbidity.

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