ORIGINAL ARTICLE

Anxiety disorder in patients with non-specific chest pain in the emergency setting

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Objectives: Many patients who have been discharged from the emergency department (ED) with a diagnosis of "non-specific chest pain" (NSCP) have anxiety disorder (AD), a commonly missed entity in acute care. The objective of this study was to delineate characteristic properties that could enhance recognition of AD in ED patients admitted with NSCP.

Methods: All patients between 18 and 65 years of age diagnosed with NSCP were enrolled. The Hospital Anxiety and Depression Scale (HADS) anxiety subscale was used as a screening test for AD. The patients with high HADS scores (≥ 10) were evaluated by a psychiatrist for AD.

Results: In total, 157 patients were enrolled in the study. HADS scores were found to be "high" (≥ 10) in 49 patients (31.2%). Patients with high HADS scores had a higher frequency of associated symptoms ($p = 0.004$). Dizziness or lightheadedness, chills or hot flushes, and fear of dying were found to have been reported more frequently by patients with high anxiety scores. Of the group with high score, 33 patients (67.3%) were interviewed by a psychiatrist, and 23 (69.7%) of these patients were diagnosed with AD. Associated symptoms were described by 21 patients with AD (91.3%). Of those with AD, 18 (78.3%) had been previously admitted to the ED with chest pain. Atypical chest pain was described by 21 patients (91.3%).

Conclusions: Physicians should always consider AD in patients presenting to the ED with chest pain after ruling out organic aetiology. Patients' definition of atypical pain, recurrent admissions to ED, and presence of associated symptoms such as dizziness, chills or hot flushes, and fear of dying could aid in considering AD.

Chest pain (CP) is a commonly encountered complaint in the emergency department, with 40–60% of such patients discharged with a diagnosis of non-specific chest pain (NSCP).^{1–4} Furthermore, most patients admitted to hospital with a presumptive diagnosis of acute coronary syndrome lack an organic disease.^{5–6} Research data indicate that 30–50% of these cases are considered to have anxiety disorder (AD).^{7–9}

The prevalence of AD has been reported to be about 13% in the general population,¹⁰ making it the most common psychiatric problem. Despite this, it is very difficult to establish a diagnosis of the entity because of patients' reluctance to be seen by a psychiatrist. While AD may be perceived as an overt sensation of nervousness, worry, and anxiety, *angor animi*, fear of going insane, or nonsense phobias, it can also appear with multiple somatic symptoms that resemble those of common medical conditions, such as palpitations, tachycardia, diaphoresis, dyspnoea, choking sensation, chest pain or pressure, dizziness, flushing and chills, paresthesias, nausea, and abdominal distress.¹⁰ Patients in the latter group are referred to the relevant outpatient clinics as prompted by their somatic complaints. Therefore, patients with CP are admitted to emergency departments (ED) and cardiology clinics.^{9–10}

Emergency physicians (EPs) frequently overlook the possibility of AD in patients with NSCP and miss the opportunity to institute the appropriate treatment and timely follow up.^{9–11–15} These patients constitute a group overusing acute care and emergency facilities.^{7–16–19} Persistence of their complaints leads to diminished quality of life, negative influence on their social life, and a waste of workforce.^{9–20} Although AD is treatable,¹² failure in recognition results in adverse consequences for both the patient and healthcare facilities. Because these patients enter the healthcare system

via the ED and cardiology outpatient clinic more commonly than psychiatric services,⁹ their recognition and management cannot be overemphasised.

The Hospital Anxiety and Depression Scale (HADS) is a self administered scale which consists of anxiety (HADS-A) and depression (HADS-D) subscales, with seven items each.²¹ It has been used in many studies to determine the frequencies of anxiety and depression.^{13–20–22} It has a score interval between zero and 21. Although most studies adopted a cutoff level of 8 or 9,²³ it is well established that the point with the highest sensitivity and specificity in the Turkish population is 10 (83.6% and 81.6%, respectively).²⁴

Although many studies focused on the frequency of AD in patients with NSCP, very few data are available to guide the physician to a diagnosis of AD, which is still a commonly missed entity in the emergency setting. The objective of this study was therefore to delineate characteristic properties that could enhance recognition of AD in ED patients admitted with NSCP.

MATERIALS AND METHODS

The study was conducted in the Dokuz Eylul University based ED, which has an annual attendance of approximately 40 000 patients. The institutional review board approved the study before commencement, and informed consent was obtained from all enrolled patients.

All consecutive adult patients between 18 and 65 years of age admitted to the ED and discharged with a diagnosis of

Abbreviations: AD, anxiety disorder; CP, chest pain; ED, emergency department; EP, emergency physician; HADS, Hospital Anxiety and Depression Scale; HADS-A, Hospital Anxiety and Depression Scale, anxiety subscale; HADS-D, Hospital Anxiety and Depression Scale, depression subscale; NSCP, non-specific chest pain; PD, panic disorder

Table 1 Exclusion criteria

Patients failed to accept enrolment in the study
Patients with unstable vital signs
Uncooperative and disoriented patients
Patients who had already been evaluated in the same study
Patients with established diagnoses other than NSCP
Patients with documented coronary artery disease
Patients with a history of trauma to chest wall, back or abdomen within the previous week

NSCP in a 3 month period were prospectively enrolled in the study. Exclusion criteria were listed in table 1. All decisions regarding inclusion and exclusion of the patients were made by experienced EPs at the bedside in all circumstances.

All patients admitted with CP were examined, their histories were taken, and ECG and chest radiograph were obtained. Advanced cardiac investigations were reserved for patients who had atypical or non-ischaemic-type chest pain, absence of any risk factors, and significant ECG changes. These patients were evaluated to rule out other potential aetiologies of chest pain. Ancillary studies were pursued if any entity was suspected. Braunwald probability classification was used to allocate patients suspected of having ischaemic-type chest pain.²⁵ Patients classified as having low probability of acute coronary syndrome were followed up in the ED for at least 6–8 hours. Patients classified as having high or medium probability were excluded. Those patients in whom potential aetiologies of chest pain had been ruled out, with normal ECGs, and low or stable levels of cardiac markers were included as patients with NSCP.

Demographic and clinical data were recorded on the datasheets by the physician in charge of the patient. A self administered form comprising HADS-A items was also handed to each patient to be completed by them without physician assistance. The patients were asked to indicate the most suitable answer for each item. Neither of the forms included the specific points of the items. Both patients and physicians were blinded to the scores elicited from the scales. A researcher assigned to the study assessed the datasheets every 24 hours, and the process was in no way related to patient care or follow up.

Patients with scores above the threshold (≥ 10 points) were called and asked to make an appointment with the psychiatric outpatient clinic. These patients were evaluated for AD by the *Diagnostic and statistical manual of mental disorders*, fourth edition (DSM-IV) criteria in the same week by an experienced psychiatrist. The psychiatric diagnoses were recorded separately and blindly by the psychiatrist.

Statistical analysis

The cut off point of the Turkish HADS form, which had previously been tested for reliability and validity, was 10,²⁴ with scores of 0–9 indicating normal levels of anxiety, and scores of 10–21 implying high risk for AD.

Data elicited from the study were analysed using SPSS. Descriptive analyses regarding demographics, history, physical findings, and vital signs were performed. Patients were assigned to one of two groups using the threshold of HADS-A score of 10. The aforementioned variables were compared between the two groups of patients. Patients with HADS-A score >10 and diagnosed as having AD were evaluated as a distinct subgroup.

Comparisons were carried out using the independent samples *t* test for means of parametric data, the Mann-Whitney *U* test for medians of non-parametric data, and the χ^2 test for categorical and ordinal data. Analyses were based

Table 2 Patient characteristics related to HADS-A scores

Patient characteristics	HADS-A score		p*
	<10 , n (%)	≥ 10 , n (%)	
Sex			
Male	53 (49.1)	15 (30.6)	0.037
Female	55 (50.9)	34 (69.4)	
Age			
18–44	60 (55.6)	29 (59.2)	0.802
45–64	48 (44.4)	20 (40.8)	
Chest pain			
Typical	11 (10.2)	4 (8.2)	0.778
Atypical	97 (89.8)	45 (91.8)	
Presence of associated symptoms	60 (55.6)	39 (79.6)	0.004
Previous referral with the same complaint	18 (16.7)	28 (57.1)	<0.001
Family history of psychiatric illness	3 (2.8)	7 (14.3)	0.011
Total	108	49	

* χ^2 test.

on 95% confidence intervals. For all tests, $p < 0.05$ was considered statistically significant.

RESULTS

In total, 163 consecutive patients admitted to the ED with the chief complaint of CP and discharged with a diagnosis of NSCP were enrolled in the study. Six patients were excluded (two for failing to give informed consent, three for having documented coronary artery disease, and one for inadequate information in the datasheet), thus statistical analyses were performed on the remaining 157 patients. The mean (SD) age of the patients was 41.6 (11.7) years (range 18–64), and 56.7% ($n = 89$) were women. Mean (SD) HADS-A scale score of the whole sample was 7.9 (3.7) (range 0–19), and 49 patients (31.2%) were found to have HADS-A scale scores ≥ 10 .

The relationship of demographic and clinical characteristics of the patients with anxiety scores are given in table 2. Mean ages of the patients with scores <10 and ≥ 10 did not differ significantly from each other (*t* test, $p = 0.959$).

Atypical CP was found in 90.4% of patients with NSCP. Family history of psychiatric illness was present in 10 (6.4%) of the patients. The frequency of family history of psychiatric illness was higher in those with high anxiety scores (table 2), as was the frequency of patients' previous visits in the ED with CP ($p < 0.001$) (table 2).

Table 3 indicates the frequencies of association of each symptom in patients with chest pain and high *versus* low anxiety scores. Palpitation and shortness of breath were the most common adjunctive symptoms. Dizziness or light-headedness, chills or hot flushes, and fear of dying were the only ones with a statistically significant relationship with high anxiety scores (table 3).

Of 49 patients at high risk for AD (HADS-A ≥ 10) 33 (67.3%) were evaluated using DSM-IV criteria for AD. Of the remaining 16 patients, four (8.1%) could not be contacted, and the other 12 (24.4%) did not comply with their scheduled dates of interview. In total, 23 patients (69.7%) were diagnosed with AD, of whom 18 were considered to have panic disorder (PD), 2 generalised AD, and 3 miscellaneous AD.

The mean (SD) age of the 23 patients diagnosed with AD was 41.4 (12.7) years (range 24–63) and 13 (56%) were women. Of the 23 patients, 18 (78%) had previously been admitted to the ED with CP. Four patients had a personal history of AD, confirmed in the evaluation, and another four patients with AD had a family history of AD. Of the 23 patients with AD, 21 (91%) described atypical CP. When

Table 3 The distribution of the symptoms associated with chest pain as to anxiety scores

Associated symptoms	HADS-A score		p*
	<10, n (%)	≥10, n (%)	
Palpitation	25 (23.1)	18 (36.7)	0.085
Diaphoresis	12 (11.1)	19 (18.4)	0.218
Trembling or shaking	9 (8.3)	8 (16.3)	0.167
Nausea or gastric discomfort	10 (9.3)	9 (18.4)	0.118
Fear of dying	6 (5.6)	11 (22.4)	0.040
Paresthesia	4 (3.7)	6 (12.2)	0.072
Lightheadedness, dizziness, faintness	8 (7.4)	11 (22.4)	0.015
Fear of going insane or losing control	1 (0.9)	3 (6.1)	0.090
Depersonalisation, derealisation	1 (0.9)	1 (2)	0.528
Chills or hot flushes	5 (4.6)	11 (22.4)	0.010
Shortness of breath, choking	22 (20.4)	13 (26.5)	0.413
Breathlessness	10 (9.3)	7 (14.3)	0.408

*Fisher's exact test.

questioned further, stabbing-type CP was the most common (39%).

Associated symptoms were noted by 21 (91%) of the 23 patients with AD; frequencies are listed in table 4.

DISCUSSION

Identification of life threatening situations and planning of expedient treatment has the highest priority in the management of patients admitted with CP. Other causative factors should be completely ruled out.^{26, 27} Approximately 40–60% of patients admitted to the ED with CP are discharged with a diagnosis of NSCP.^{1–4} Although patients diagnosed with NSCP have a low mortality rate, some studies attest that their social and professional lives may be adversely affected.^{9, 11, 20, 26–29} Many studies have indicated that the frequency of AD, especially that of PD, is considerably higher in patients with NSCP, with reported rates of 30–50%.^{7, 15, 28, 30–33}

The HADS-A subscale was used to identify patients at high risk for AD in the group referred to the ED and eventually discharged with NSCP.^{13, 20, 22} The frequency of AD and/or depression was found by Kuijpers *et al* to be as high as 73.3% among patients with NSCP and HADS scores ≥8.²² Consistent with this study, nearly 70% of patients with high anxiety scores and evaluated by the psychiatrist were diagnosed as AD in our study. Meanwhile, another study pointed out that 57% of patients with no organic aetiologies of CP or palpitation had high HADS scores, attributed in 83% to anxiety and/or depression;¹³ compared with this, our study found lower rates of high anxiety scores and lower rates of AD among those with high anxiety scores. The difference may have resulted from inclusion of the patients with palpitation in the former study. An additional cause might have been that only 67% of our patients with high anxiety complied with attendance for psychiatric interview.

The percentage of the patients with high anxiety scores identified in the study by Goodacre *et al*²⁰ was lower than that was found in our study. They emphasised the importance of inclusion of psychiatric entities in the differential diagnoses of these patients to prevent the potential morbidity and impaired quality of life. The study reported that HADS is relatively easy to administer and calculate at the bedside. Routine use of psychological assessment instruments may play a role in improving detection.

Several studies have shown that PD is very common among patients with CP.^{9, 11, 28, 30, 31, 33–35} Our study concurs with

Table 4 Frequencies of the associated symptoms in patients with AD

Associated symptoms	n	%
Absent	2	9
Present	21	91
Palpitation	14	61
Shortness of breath or choking	10	44
Fear of dying	8	35
Lightheadedness, dizziness, faintness	7	30
Chills or hot flushes	7	30
Diaphoresis	6	26
Trembling or shaking	6	26
Nausea or gastric discomfort	6	26
Breathlessness	4	17
Paresthesia	3	13
Fear of going insane or losing control	3	13
Depersonalisation, derealisation	1	4

these results, with the majority (78.3%) of patients with AD having a diagnosis of PD.

The prevalence of PD is 2–3 times greater in women than in men.³⁴ Most studies have also demonstrated higher rates of PD in women with CP than in men with CP.^{15, 28, 30, 36–39} Consistently, the percentage of women with high anxiety scores was significantly higher than that of men. Women also had a higher prevalence of AD after psychiatric interview than did men, although the ratio of women to men was decreased.

The literature data cite that PD is found more commonly in younger than in older patients admitted with CP.^{15, 28, 37, 38} We also found this; more than three fifths of patients with AD were young individuals our study.³⁴

A wide array of somatic and psychogenic complaints is attributed to patients with PD. Table 3 lists the symptoms defined in DSM-IV. Autonomic symptoms are reported to be closely accompany PD.^{39, 40} In our study, adjunctive symptoms were found more commonly in patients with high anxiety scores than those without. Of these symptoms, dizziness or lightheadedness, chills or hot flushes, and fear of dying were found to be significantly related to high anxiety scores. The vast majority of patients with AD had at least one adjunctive symptoms accompanying CP. These data suggest that AD should not be overlooked. Identification of these symptoms associated with CP could be a clue to the diagnosis of AD.

However, another pitfall related to the diagnosis of AD is overdiagnosis. The diagnosis should not be established before the completion of all relevant investigations in accord with the patient's presentation, as most of these symptoms could herald serious organic disorders. It should also be remembered that AD may be found in conjunction with these disorders, and that the presence of AD can never rule out other more serious disease processes occurring concomitantly in the patient. Therefore, the prudent EP should definitely exclude other diseases that could also cause similar signs and symptoms before considering AD.

It is common practice that patients discharged with NSCP are not considered to have AD and not referred to the relevant disciplines.^{9, 15, 30, 34, 41} This could contribute to the frequent referrals of these patients to health institutions because of the repetitive nature of their symptoms.¹⁶ In our study, 78% of patients diagnosed with AD had had previous referrals to the ED within the previous 6 months. This finding supports the conclusion that EPs frequently overlook AD and that this causes repetitive referrals to the ED.

Limitations

The numbers of patients with CP and of those with high anxiety scores are very limited in the present study. Likewise,

that fact that two thirds of those with high scores attended for psychiatric interview could represent a systematic bias for statistical analysis. Another drawback might be that psychiatric evaluation only of patients with high scores by psychiatrist could lead to missed cases among those with low scores.

CONCLUSION

This study confirms the high prevalence of AD among patients with NSCP, and has identified that a number of clinical features can be used to enhance recognition of AD. Short and easy to use screening tests such as HADS may be used to identify risk stratification for AD. In addition, definition of atypical pain, recurrent admissions to the ED, presence of many associated symptoms such as dizziness, chills or hot flushes, and fear of dying could aid in diagnosing AD. EPs and other primary care physicians should be alert to recognise or exclude AD in patients with NSCP.

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