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Original article

Investigation of anxiety levels of patients with chest pain admitted to emergency department



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ABSTRACT

Introduction: We aimed to investigate the demographical features, anxiety levels and clinical findings of the patients admitted to our Emergency department (ED) due to chest pain.

Methods: Patients with chest pain older than 18 years were included into the study. Demographical features such as age, sex and education level, initial diagnosis in the ED, whether they were hospitalized or coronary intervention performed, were recorded. To determine the anxiety levels of the patients, State-trait Anxiety Inventory (STAI) was performed.

Results: Two-hundred and eight adult patients with chest pain were included into the study. We could not determine a relationship between STAI levels of patients according to demographical findings, however, STAI scores tended to decrease by age. Considering the education levels of the patients, it was determined that STAI scores of university graduates were higher than others. The STAI scores of patients discharged from the ED were higher than those hospitalized. When patients were compared according to whether coronary intervention (CI) was performed or not, it was determined that patients who did not require CI had higher STAI scores. When coronary lesion localization of the patients hospitalized was investigated, any relationship could not be determined.

Conclusion: In this study, we determined that anxiety levels of the patients with chest pain do not correlate with the severity of the disease. Higher anxiety levels of patients discharged from ED when compared to those with ACS is a challenging problem for both ED physicians and cardiologists.

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1. Introduction

Chest pain is one of the most common complaints among Emergency department (ED) admissions.¹ Determination of life-threatening conditions and making accurate diagnosis are the mainstays of management. In 40–60% of patients with chest pain, life-threatening conditions such as acute coronary syndrome (ACS) are not determined and these patients are being discharged with diagnosis of non-specific chest pain.^{2,3} It was also reported that in

80% of the patients with chest pain, cardiologists make a diagnosis of non-cardiac chest pain. In group of patients with non-cardiac chest pain, 50–70% suffer continuous chest pain causing loss of labor, inappropriate hospitalization and unnecessary use of cardiac drugs.⁴ In patients with atypical chest pain without an organic reason, it is reported that psychiatric disorders such as panic attack and depression may be seen.⁵ In the literature, there are studies reporting that frequency of depression, anxiety and alexithymia is higher than normal controls. In the literature, there is study reporting that frequency of depression, anxiety and alexithymia is higher than normal controls. In the study, it was reported that anxiety, depression and neurotic tendency are more frequently seen in patients with non-cardiac chest pain.⁶ In this study, we aimed to determine demographical features, anxiety status and clinical findings of patients admitted to our ED due to chest pain.

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2. Material and methods

After ethical approval from Local Ethic Committee, 208 adult patients with chest pain admitted to our ED were involved into the study. A form called the State-Trait Anxiety Inventory (STAI) was filled by the patients in order to determine anxiety levels. The STAI is a validated 20 item self report assessment device which includes separate measures of state and trait anxiety. The original STAI form was constructed by Charles D. Spielberger, Richard L. Gorsuch, and Robert E. Lushene in 1970. According to the scale, higher scores are positively correlated with higher levels of anxiety.⁷ The STAI has been adapted in more than 30 languages for cross-cultural research and clinical practice. It was also adapted to Turkish Society by Onver and Le Conte. In our study, the original version of the form was used (Tables 1a and 1b).

Patients with co-morbidities (pneumonia, acute abdomen, urinary tract infection), acute ST elevation, hypertensive crisis and a history of psychoactive drug use were excluded from the study. Data of the patients was recorded on standard forms according to their demographical features (age, sex, education level), findings of coronary artery disease and STAI scores.

All data was analysed by Statistical Package for Social Sciences for Windows (SPSS) 20.0 programme. For normally distributed data, Student's t test was used in comparison of mean values of two different groups. In comparison of more than two groups, ANOVA (Tukey's) test was used. When data was not normally distributed, Kruskal–Wallis test was used. Then groups were compared by Bonferroni corrected Mann–Whitney U test (p value lower than 0.05 was considered statistically significant). In correction analyses, Spearman correlation analysis was used.

3. Results

Of 208 patients with chest pain, 131 were male (63%) and 77 were female (37%). It was determined that as the age increases, STAI scores tended to decrease. When patients were compared according to sex, any statistical significance could not be determined in STAI scores. When education status of the patients was investigated, a statistical significance was determined between literates and illiterates (Table 2). It was also determined that 105 of 208 patients were hospitalized in coronary intensive care unit while 103 were discharged from the ED. Of the 105 patients hospitalized,

70 were diagnosed as unstable angina pectoris (UAP) and 35 as non-STEMI. A statistical significance was determined between patients hospitalized and discharged from the ED according to STAI scores. Those who were discharged had higher scores. Coronary angiography was performed in all patients hospitalized. In 65 of these patients, percutaneous coronary intervention (CI) was performed. In addition, there was a significant statistical between the patients who underwent PTCA and who did not. Patients who did not undergo CI had higher STAI scores. In patients who had no confirmed coronary lesion after intervention, the STAI scores were higher (Table 3).

Patients were also divided into subgroups according to the location of the coronary lesion; Left anterior descending (LAD), right coronary artery (RCA), LAD + Circumflexing (Cx), (LAD + RCA, RCA + Cx, LAD + Cx + RCA). It was determined that there was not any statistical significance in STAI scores according to the location of the lesion.

4. Discussion

Anxiety is a major health problem that affects life quality and causes loss of labor and unnecessary health spendings. In a study with anxiety patients, it was determined that pain is the most common complaint with a proportion of 81%.⁸ It was reported that female patients with chest pain present with anxiety more frequently.⁹ Thus, female patients with chest pain are twice more consulted to cardiologists when compared to male patients. This may result in inappropriate medical treatment and poor results.¹⁰ While male patients reveal psychological symptoms of anxiety such as tension, susceptibility and a premonition of a bad event, female patients tend to present with chest pain, palpitation, shortness of breath and nausea. Besides, while anxiety of male patients is commonly related to sexual problems and return to job, female patients worry about their responsibilities such as care of their children.¹¹ In our study, there was no difference in anxiety levels of two genders.

As the education level increases, anxiety score increases as well.⁹ In concordance, our study revealed that more educated people have higher anxiety levels. However, there is no strong evidence in literature to suggest that there is any relationship between the education status and anxiety level.¹² So, it is possible to say that relationship between education status and anxiety level is

Table 1a
State anxiety inventory (STAI 1).

		Not at all	Somewhat	Moderately so	Very much so
1.	I feel calm	(1)	(2)	(3)	(4)
2.	I feel secure	(1)	(2)	(3)	(4)
3.	I am tense	(1)	(2)	(3)	(4)
4.	I feel strained	(1)	(2)	(3)	(4)
5.	I feel at ease	(1)	(2)	(3)	(4)
6.	I feel upset	(1)	(2)	(3)	(4)
7.	I am presently worrying over possible misfortunes	(1)	(2)	(3)	(4)
8.	I feel satisfied	(1)	(2)	(3)	(4)
9.	I feel frightened	(1)	(2)	(3)	(4)
10.	I feel comfortable	(1)	(2)	(3)	(4)
11.	I feel self-confident	(1)	(2)	(3)	(4)
12.	I feel nervous	(1)	(2)	(3)	(4)
13.	I am jittery	(1)	(2)	(3)	(4)
14.	I feel indecisive	(1)	(2)	(3)	(4)
15.	I am relaxed	(1)	(2)	(3)	(4)
16.	I feel content	(1)	(2)	(3)	(4)
17.	I am worried	(1)	(2)	(3)	(4)
18.	I feel confused	(1)	(2)	(3)	(4)
19.	I feel steady	(1)	(2)	(3)	(4)
20.	I feel pleasant	(1)	(2)	(3)	(4)

Table 1b
Trait anxiety inventory (STAI 2).

		Almost never	Sometimes	Often	Almost always
21.	I feel pleasant	(1)	(2)	(3)	(4)
22.	I feel nervous and restless	(1)	(2)	(3)	(4)
23.	I feel satisfied with myself	(1)	(2)	(3)	(4)
24.	I wish I could be as happy as others seem to be	(1)	(2)	(3)	(4)
25.	I feel like a failure	(1)	(2)	(3)	(4)
26.	I feel rested	(1)	(2)	(3)	(4)
27.	I am "calm, cool and collected"	(1)	(2)	(3)	(4)
28.	I feel that difficulties are piling up so that I cannot overcome them	(1)	(2)	(3)	(4)
29.	I worry too much over something that really doesn't matter	(1)	(2)	(3)	(4)
30.	I am happy	(1)	(2)	(3)	(4)
31.	I have disturbing thoughts	(1)	(2)	(3)	(4)
32.	I lack self-confidence	(1)	(2)	(3)	(4)
33.	I feel secure	(1)	(2)	(3)	(4)
34.	I make decisions easily	(1)	(2)	(3)	(4)
35.	I feel inadequate	(1)	(2)	(3)	(4)
36.	I am content	(1)	(2)	(3)	(4)
37.	Some unimportant thought runs through my mind and bothers me	(1)	(2)	(3)	(4)
38.	I take disappointments so keenly that I can't put them out of my mind	(1)	(2)	(3)	(4)
39.	I am a steady person	(1)	(2)	(3)	(4)
40.	I get in a state of tension or turmoil as I think over my recent concerns and interests	(1)	(2)	(3)	(4)

Table 2
Comparison of the State Anxiety Inventory scores of the patients in respect to education levels.

	n	Maximum	Minimum	Median	Mean + Standard deviation
Illiterate	64 (%31)	71	21	42	43 ± 11
Primary School	31 (%15)	64	25	51	48 ± 10
High School	29 (%14)	68	23	53	51 ± 11
Lycee	57 (%27)	76	28	52	52 ± 14
University	27 (%13)	72	31	61	55 ± 13

n = number of patients, p values when illiterates are compared to graduates from primary school, lycee and university are respectively p: 0.024, p: 0.000, p: 0.000 (p < 0.05).

Table 3
Statistical significant differences between patient groups in respect to STAI scores.

	STAI 1					STAI 2				
	Maximum	Minimum	Median	Mean ± Standard deviation	p	Maximum	Minimum	Median	Mean ± Standard deviation	p
Hospitalized	67	32	45	47 ± 8	0.00	65	21	41	42 ± 10	0.00
Discharged	79	29	64	62 ± 10	0.00	76	28	56	55 ± 11	0.00
CI performed n = 65	67	32	45	46 ± 9	>0.05	62	21	41	41 ± 10	0.023
CI not performed n = 40	64	33	50	49 ± 8	0.023	65	31	44	46 ± 11	0.023

STAI: State-trait anxiety inventory, CI: Coronary intervention, n = number of patients.

unclear and may be affected by many factors such as religion and culture.

Patients with chest pain are either hospitalized or discharged from the ED. This decision is usually made by cooperation of ED physicians and cardiologists. Anxiety is a common complaint among patients with chest pain. There are many studies reporting that anxiety accompanies chest pain in 31–56% of patients.^{13–15} Interestingly, patients hospitalized due to ACS have lower anxiety levels. Besides, it is known that anxiety may accompany ACS.¹⁶ In a study by Smeijers et al, it was reported that anxiety was strongly associated with non-cardiac chest pain regardless of personality factors. When compared to reference group, patients with non-cardiac chest pain were found to be more worried, tense and frightened.¹⁷ In another study, it was reported that patients with a low trait anxiety had significantly less ischemic segments on the myocardial perfusion imaging than patients with a high trait anxiety. Patients with typical chest pain and normal coronary angiogram were found to be under risk of having ischemia.¹⁸ In our study, we determined higher levels of anxiety in patients discharged from the hospital when compared to patients with ACS. This finding may result in bad consequences for emergency physicians. Patients with

ACS who have lower anxiety levels may result in extenuated chest pain and misdiagnosis. We suggest that emergency physicians should evaluate patients according to clinical and laboratory findings rather than subjective criteria such as level of anxiety.

In a study, anxiety levels of patients with non-STEMI, UAP and STEMI were compared and any statistical significance could not have been determined.¹⁹ In our study, we also could not determine significant difference between patients with non-STEMI and UAP.

In another study, patients treated with percutaneous CI for MI, UAP, or stable AP did not differ in their anxiety and depression levels. Although MI patients undergoing percutaneous CI we expected to experience higher levels of anxiety and depression than UAP or stable AP patients, this hypothesis could not be confirmed.²⁰ In our study, when patients who underwent CI were compared with those who did not, it was determined that there was not a statistical significance according to state anxiety level. However, there was a statistical significance according to trait anxiety levels. Anxiety scores of the patients to whom CI was not performed were greater than the others.

Between the localization of the lesion and level of anxiety, any statistical significance could not be determined. In the literature,

we observed that there is a lack of knowledge in this field. This relationship, if there is, may be revealed by further investigations with larger groups of patients.

This study has limitations because it was conducted at a hospital where patient population characteristics are homogeneous in terms of lifestyle, habits, and religious beliefs.

In conclusion, anxiety disorder is a treatable medical situation when appropriately diagnosed. Most of the patients are admitted to emergency and cardiology departments instead of psychiatry. So, it is important for emergency physicians and cardiologists to consider this diagnosis.^{21,22} Patients with anxiety visit EDs frequently and are mostly discharged from the EDs. However, it is also known that these patients may be a factor in high rate of hospital admissions, loss of labor hours, and increase in health costs.²³ In patients hospitalized, many factors contribute to reduce anxiety levels such as approach of medical staff to the patients. Clues to diagnosis of anxiety disorder are autonomic symptoms accompanying chest pain, recurrent chest pain and multiple physical complaints at the same time.²¹

5. Conclusions

Our study revealed that agitation of the patients with chest pain does not correlate with the severity of the disease. Higher anxiety levels of patients discharged from ED when compared to those with ACS is a challenging problem for both ED physicians and cardiologists. These patients stay in EDs for an unnecessary long time. Besides patients with ACS who have lower anxiety levels may mistakenly be discharged from EDs.

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