

Panic Disorder in Emergency Department Chest Pain Patients: Prevalence, Comorbidity, Suicidal Ideation, and Physician Recognition

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PURPOSE: To establish the prevalence of panic disorder in emergency department (ED) chest pain patients; compare psychological distress and recent suicidal ideation in panic and non-panic disorder patients; assess psychiatric and cardiac comorbidity; and examine physician recognition of this disorder.

DESIGN: Cross-sectional survey (for psychiatric data). Prospective evaluation of patient discharge diagnoses and physician recognition of panic disorder.

SETTING: The ambulatory ED of a major teaching hospital specializing in cardiac care located in Montreal, Canada.

SUBJECTS: Four hundred and forty-one consenting, consecutive patients consulting the ED with a chief complaint of chest pain.

PRIMARY OUTCOME MEASURE: Psychiatric diagnoses (AXIS I). Psychological and pain test scores, discharge diagnoses, and cardiac history.

RESULTS: Approximately 25% (108/441) of chest pain patients met DSM-III-R criteria for panic disorder. Panic disorder patients displayed significantly higher panic-agoraphobia, anxiety, depression, and pain scores than non-panic disorder patients ($P < 0.01$). Twenty-five percent of panic disorder patients had thoughts of killing themselves in the week preceding their ED visit compared with 5% of the patients without this disorder ($P = 0.0001$) even when controlling for co-existing major depression. Fifty-seven percent (62/108)

panic disorder patients also met criteria for one or more current AXIS I disorder. Although 44% (47/108) of the panic disorder patients had a prior documented history of coronary artery disease (CAD), 80% had atypical or nonanginal chest pain and 75% were discharged with a "noncardiac pain" diagnosis. Ninety-eight percent of the panic patients were not recognized by attending ED cardiologists.

CONCLUSIONS: Panic disorder is a significantly distressful condition highly prevalent in ED chest pain patients that is rarely recognized by physicians. Nonrecognition may lead to mismanagement of a significant group of distressed patients with or without coronary artery disease. *Am J Med* 1996;101;371-380.

Chest pain commonly prompts presentation to an emergency department (ED) or medical clinic.^{1,2} A symptom that commands attention from both patient and physician, chest pain is a cardinal feature of coronary artery disease, a leading cause of death in North America. However, most chest pain patients consulting the ED or in primary care are discharged with a noncardiac chest pain diagnosis.^{1,4} Despite an excellent survival prognosis, follow-up studies suggest that more than 50% of these patients continue to suffer from chest pain, repeatedly consult physicians, and report psychosocial disability.⁵⁻⁸ Noncardiac chest pain is thus a common, costly phenomenon in medicine.

Psychological factors have been suspected as a cause of noncardiac chest pain for more than a century.⁹⁻¹¹ Yet, a search for a physical cause has been the main focus of investigation. Mitral valve prolapse, microvascular angina, syndrome X, esophageal motility disorders, hyperventilation syndrome have been proposed as causes for chest pain. However, psychiatric disorders are common in patients with these conditions and many patients with chest pain present no identifiable physical cause (see ref. 12 for a review).

Recent research suggests that approximately 30% of noncardiac chest pain patients have panic disorder (PD).^{13,14} This specific disabling anxiety disorder occurs in 1 to 4% of the overall population (with or

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without agoraphobia).¹⁵ Its considerable prevalence in chest pain patients has been attributed to symptom similarity with cardiovascular disorders and to panic patients' tendency to focus on and catastrophically interpret their bodily sensations.^{16,17} This may also contribute to rendering PD among psychiatric conditions associated with the highest rates of ED or medical services' utilization.¹⁷⁻²⁰ Not detected and untreated, patients with PD continue to suffer chronically and may develop other psychiatric conditions.²¹⁻²⁴ Although controversial, PD is also considered a risk factor for suicidal behavior.^{25,26} Because the ED may be the point of entry for many patients with PD,²⁷ estimating the prevalence and physician recognition of this highly treatable disorder^{28,29} in this setting is important.

We are unaware of any study establishing PD prevalence in consecutive ED chest pain patients. Yingling et al,³⁰ using screening instruments to estimate the frequencies of psychiatric disorders in 229 consenting acute ED chest pain patients, reported that 17.5% had a symptom profile consistent with PD. This figure suggests the need to conduct studies with structured interview protocols to establish the prevalence of a PD diagnosis in these patients.

Studies that have used structured interview protocols to establish PD prevalence in chest pain patients present certain methodological problems:³¹ small samples (35 to 104 patients),^{13,14,32-35} low subject participation rates (up to 70% refusal),^{32,33} psychiatric interviewers nonblinded to patient's medical diagnosis,^{14,32,33} and failure to present inter-rater reliability agreement for PD diagnoses.³³⁻³⁵ Moreover, none of these studies has examined suicidal ideation and few physician recognition of PD.³³ Finally, most prevalence studies have focused on noncardiac chest pain patients. PD also occurs, and may be particularly problematic, in patients with a history of CAD and unexplained chest pain.^{36,37}

The objectives of this study are to: 1) establish PD prevalence in consecutive patients consulting the ED for chest pain; 2) compare psychological distress and suicidal ideation in PD and non-PD chest patients; 3) evaluate psychiatric and cardiac comorbidity in PD patients; and 4) examine physician recognition of this disorder.

METHODS

The research protocol was accepted by the Montreal Heart Institute's Scientific Committee on January 18, 1993 and by the Ethics Committee, February 18, 1993.

Subjects

Four hundred and forty-one consenting, consecutive chest pain patients presenting to the ambulatory

ED participated in the study. All subjects were Caucasian. There were 172 (39%) women and 269 (61%) men with a mean age of 56.8 years (SD = 12.4). Inclusion criteria were: complaint of chest pain, ability to comprehend French, and capability to complete evaluation while in the ED. Exclusion criteria were: significant cognitive impairment or current psychotic state. A total of 607 chest pain patients were contacted by research assistants to participate in the study. The study was conducted between 9 A.M. and 5 P.M., Mondays through Fridays from February 1993 to June 1994.

Fifty-one (8.5%) subjects were not included for language purposes. Eighteen (3%) patients had already participated. Ninety-seven (16%) patients did not consent to participate. The following reasons were given for refusing to participate: lack of time (29%), not interested (16%), too tired or uncomfortable to participate (10%), no precise reason (45%). Nonconsenting patients did not differ significantly from consenting patients in age, gender, cardiac history and discharge diagnoses ($P > 0.05$).

Procedure

Patients with a chief complaint of chest pain were identified by the ED triage nurse who then paged in-house research assistants. Nurses were asked to avoid any other screening for inclusion in the study. Trained research assistants conducted psychiatric interviews and had patients complete the questionnaires in the ED. The on-duty ED cardiologists examined patients and completed the Chest Pain Quality Scale (described further) for eligible patients. The ambulatory ED is staffed by 28 certified cardiologists on rotating schedules (average age = 47.9 years [SD = 9.9]; number of years experience in cardiology practice = 18.4 [SD = 9.6]). All cardiologists participated in the study. Both cardiologists and nurses were blinded to psychiatric diagnoses. Research assistants conducting psychiatric interviews were blinded to chest pain and medical diagnoses as well as to the specific objectives of this study to minimize experimenter expectancy effect.

INSTRUMENTS

Self-Report

Patients completed the following self-report psychological and pain questionnaires: Panic-Agoraphobia: Mobility Inventory for Agoraphobia (MIA),³⁸ Agoraphobia Cognitions Questionnaire (ACQ),³⁹ Body Sensations Questionnaire (BSQ),³⁹ Anxiety: State-Trait Anxiety Inventory (STAI),⁴⁰ Depression: Beck Depression Inventory (BDI),⁴¹ Pain: the Short Form-McGill Pain Questionnaire (SF-MPQ).⁴²

The selected questionnaires are widely used in research and clinical practice. They display good-to-

excellent psychometric properties. Most are considered state of the art. The Panic-Agoraphobia scales were recently recommended by a group of leading panic researchers as essential instruments to use in panic studies.⁴³

The complete battery of self-report questionnaires takes between 20 and 45 minutes for patients to complete.

Psychiatric Interview

The Anxiety Disorders Interview Schedule-Revised (ADIS-R)⁴⁴ was used in the study. This structured interview protocol, for use by trained professionals, was developed to provide AXIS 1 diagnosis of anxiety and mood disorders. It also includes screening questions for alcohol and substance abuse disorders. The ADIS-R displays good inter-rater reliability for PD diagnosis⁴⁵ and is one of the recommended structured interview protocols for panic research.⁴³ For the purpose of this study, only current AXIS I diagnoses were sought.

Interviewers were two PhD level clinical psychology students and one clinical psychologist specifically trained in the administration of the ADIS-R. All interviews were audiotaped. Average inter-rater reliability between the three interviewers for PD diagnosis (presence or absence of disorder) was high ($\kappa = 0.81$)⁴⁶ based on the rating of 100 randomly selected taped interviews (23% of total number of conducted interviews).

Chest Pain Type Diagnosis

The Chest Pain Quality Scale was used by cardiologist to classify chest pain into typical, atypical angina or nonanginal categories. Typical angina pain is associated with a higher probability of CAD than atypical or nonanginal pain.⁴⁷ Typical angina was defined as having the three following characteristics: 1) substernal pain, 2) pain most often exertional, and 3) pain quickly relieved by rest or nitroglycerin. Atypical angina was defined as chest pain with two of the typical angina characteristics; nonanginal pain was defined as chest pain with one or none of the typical qualities. These chest pain definitions are consistent with those generally used in clinical cardiology practice and previous panic-cardiology research.^{32,48}

The Chest Pain Quality Scale also includes the following yes/no questions:

1) Based on your initial assessment of this patient's condition, do you believe that the chest pain can be fully explained by a cardiac pathology?

2) Do you believe there is a psychological component to this patient's chest pain?

3) Would you refer this patient to a mental health professional for psychological/psychiatric assessment or treatment?

MEDICAL ASSESSMENT

The medical tests ordered were at the cardiologist's discretion consistent with standard clinical practice. Medical charts were reviewed approximately 3 months after the ED visit by a clinical nurse, blind to the patient's psychiatric diagnosis, to allow time for in- or outpatient medical testing. Medical charts were searched for history of CAD and hospital discharge diagnoses after the ED visit. Positive history of CAD was indicated when the patient met either of the following conditions: a documented history of myocardial infarct, coronary bypass surgery (CABG), percutaneous transluminal coronary angioplasty (PTCA), angiographic testing indicating at least 50% stenosis in one of the major coronary arteries, or thallium or technetium-99m sestamibi studies indicating presence of myocardial ischemia.

STATISTICAL ANALYSIS

We analyzed categorical data using Fischer's exact test or chi-square analysis. For comparisons with continuous variables, ANOVA's were conducted. Bonferroni's correction for multiple comparisons was applied. Level of significance was set at $P < 0.05$.

RESULTS

PD Prevalence

Approximately 25% (108/441) of chest patients met the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R) criteria for PD (with or without agoraphobia).

Demographics

PD patients were significantly younger than non-PD patients. There was no significant association between PD and gender. Roughly, the same proportion of men and women received PD diagnoses as those not diagnosed with this problem. Moreover, there was no significant relation between PD diagnosis, marital and employment status, as well as level of education (**Table I**).

Psychiatric Comorbidity

Of the 108 patients diagnosed with PD, 62 (57%) also met diagnostic criteria for one or more current AXIS I disorders. The most common comorbid psychiatric disorders were generalized anxiety disorder, agoraphobia, dysthymia, and major depression. As displayed in **Table II** most AXIS I disorders were significantly associated with PD.

TABLE I
Demographical Information on PD and Non-PD Patients

| Variable | PD Patients (n = 108) | Non-PD Patients (n = 333) | P |
|--------------------------------|--------------------------|------------------------------|--------|
| Age (years) (SD) | 52.4 (11.9) | 58.3 (12.2) | 0.0001 |
| Gender | | | |
| No. of patients (%) | | | 0.842* |
| Male | 65 (60.2) | 220 (66) | |
| Female | 43 (39.8) | 113 (34) | |
| Marital status | | | |
| No. of patients (%) | | | 0.245* |
| Single | 16 (14.8) | 13 (9.3) | |
| Married or living with someone | 65 (60.2) | 221 (66.3) | |
| Separated/divorced/widowed | 27 (25) | 81 (24.3) | |
| Employment status | | | |
| No. of patients (%) | | | 0.405* |
| Currently employed | 51 (47.2) | 142 (42.6) | |
| Not currently employed | 57 (52.8) | 191 (57.4) | |
| Education | | | |
| No. of patients (%) | | | 0.991* |
| Elementary | 33 (30.6) | 103 (30.1) | |
| High school | 41 (38.0) | 124 (37.2) | |
| College/university | 34 (32.0) | 106 (31.8) | |

PD = panic disorder.
* Nonsignificant.

TABLE II
Psychiatric Comorbidity

| | PD Patients (n = 108) n (%) | Non-PD Patients (n = 333) n (%) | Fischer's Exact Test | P |
|--------------------------------|-----------------------------------|---------------------------------------|----------------------|--------|
| Agoraphobia | 16 (14.8) | 4 (1.2) | — | 0.0001 |
| Major depression | 12 (11.1) | 6 (1.8) | — | 0.0001 |
| Dysthymia | 14 (13) | 12 (3.6) | 12.88 [†] | 0.0003 |
| Generalized anxiety disorder | 36 (33.3) | 32 (9.7) | 35.19 [†] | 0.0001 |
| Post-traumatic stress disorder | 6 (5.6) | 3 (1) | | 0.008 |
| Simple phobia | 5 (4.6) | 3 (1) | | 0.024* |
| Social phobia | 3 (2.8) | 1 (0.3) | | 0.047* |
| Obsessive-compulsive disorder | 3 (2.8) | 2 (0.6) | | 0.09* |
| Substance abuse/dependence | 3 (2.8) | 1 (0.3) | | 0.047* |

PD = panic disorder.
[†] χ^2 statistic.
* Nonsignificant when Bonferroni's correction is applied.

Psychological and Pain Scores

PD patients obtained significantly higher scores than non-PD patients on all of the psychological and pain measures with the exception of the present pain index of the Short Form-McGill Pain Questionnaire when Bonferroni's correction is applied. Results suggest that PD patients display more PD-agoraphobia symptomatology, are more depressed, anxious, and, with the exception of equivalent pain intensity levels, have higher pain scores (Table III).

Because a significant proportion of the PD patients also had a history of CAD, it can be hypothesized that the higher scores on the psychological/pain scales may be due to the presence of this serious cardiovascular disease in these PD patients. To

verify this, we conducted a series of two factor ANOVAs with PD and CAD as independent variables on all psychological scales. No main effect for a history of CAD was found and there were no interaction effect between PD and a history of CAD. Hence, the higher psychological distress observed in PD patients compared to non-PD patients cannot be explained by a history of CAD.

Suicidal Ideation

Suicidal ideation was assessed with question 9 of the BDI.⁴¹ Directions for the BDI require that the patient pick out the one statement that best describes the way he has been feeling in the past week, including the day he completes the questionnaire.

TABLE III

Mean Scores on Psychological and Pain Scales for PD and Non-PD Groups

| Variable | PD Patients (n = 108) | | Non-PD Patients (n = 333) | | DF | F-test | P |
|--------------------------------------|--------------------------|---------|------------------------------|---------|-----|--------|--------|
| | Mean | (SD) | Mean | (SD) | | | |
| Panic-agoraphobia measures | | | | | | | |
| Mobility Inventory for agoraphobia | | | | | | | |
| "unaccompanied" subscale | 1.56 | (0.99) | 1.12 | (0.36) | 433 | 45.04 | 0.0001 |
| "accompanied" subscale | 1.45 | (0.84) | 1.10 | (0.30) | 433 | 38.47 | 0.0001 |
| Agoraphobia Cognitions Questionnaire | 1.73 | (0.76) | 1.23 | (0.45) | 391 | 60.29 | 0.0001 |
| Body Sensations Questionnaire | 2.20 | (0.86) | 1.72 | (0.75) | 411 | 25.45 | 0.0001 |
| Mood | | | | | | | |
| Beck Depression Inventory | 15.01 | (11.50) | 7.80 | (7.10) | 440 | 60.65 | 0.0001 |
| Pain | | | | | | | |
| Short Form-McGill Pain Questionnaire | | | | | | | |
| Sensory subscale | 21.72 | (7.22) | 18.76 | (6.12) | 440 | 17.59 | 0.0001 |
| Affective subscale | 8.77 | (3.11) | 7.13 | (3.00) | 440 | 23.8 | 0.0001 |
| Present Pain Index | 2.34 | (2.21) | 1.97 | (1.07) | 440 | 5.4 | 0.021* |
| Total score | 32.42 | (10.53) | 27.85 | (8.8) | 440 | 19.9 | 0.0001 |
| Anxiety | | | | | | | |
| State-Trait Anxiety Inventory | | | | | | | |
| State anxiety | 50.16 | (12.82) | 40.94 | (12.15) | 440 | 45.64 | 0.0001 |
| Trait anxiety | 46.83 | (12.53) | 36.30 | (11.31) | 440 | 67.6 | 0.0001 |

PD = panic disorder.

* Nonsignificant when Bonferroni's correction applied.

TABLE IV

A. Suicidal Ideation in PD and non-PD Patients in Week Previous to their ED Visit

| Response to question 9 of the BDI | PD (n = 101) n (%) | Non-PD (n = 322) n (%) |
|---|--------------------------|------------------------------|
| I don't have any thoughts about killing myself | 76 (75.2) | 305 (94.7) |
| I have thoughts about killing myself but I would not carry them out | 19 (18.8) | 16 (5.0) |
| I would like to kill myself | 2 (2.0) | 0 (0) |
| I would like to kill myself if I had a chance | 4 (4.0) | 1 (0.3) |

B. Suicidal Ideation in PD and Non-PD Patients: χ^2 Analyses

| | PD (n = 101) n (%) | Non-PD (n = 322) n (%) | χ^2 | P |
|----------------------|--------------------------|------------------------------|----------|--------|
| No suicidal thoughts | 76 (75.2) | 305 (94.7) | 32.6 | 0.0001 |
| Suicidal thoughts | 25 (24.8) | 17 (5.3) | | |

C. Suicidal Ideation in PD and Non-PD Patients Excluding Patients with Current Major Depression: χ^2 Analyses

| | PD (n = 91) n (%) | Non-PD (n = 315) n (%) | χ^2 | P |
|----------------------|-------------------------|------------------------------|----------|--------|
| No suicidal thoughts | 69 (75.8) | 300 (95.2) | 32.1 | 0.0001 |
| Suicidal thoughts | 22 (24.2) | 15 (4.8) | | |

PD = panic disorder.

ED = emergency department.

BDI = Beck depression inventory.

423/441 subjects responded to this item on the BDI (101 PD and 322 non-PD patients). Approximately 25% (25/101) of PD patients reported having suicidal thoughts in the week preceding their ED visit compared to 5% (17/322) of the non-PD patient ($P = 0.0001$). Results are presented in **Table IV**.

Items 2-4 were collapsed to respect the minimum expected cell frequency postulates for chi-square analyses.

It can be argued that the elevated proportion of PD patients with suicidal ideation is due to the presence of major depression in these patients. To verify

TABLE V

| | Medical Comorbidity | | χ^2 | P |
|------------|--------------------------|------------------------------|----------|--------|
| | PD Patients (n = 108) | Non-PD Patients (n = 333) | | |
| History of | n (%) | n (%) | | |
| CAD | 48 (44) | 168 (50.4) | 1.01 | 0.315* |
| CABG | 14 (12.9) | 63 (18.9) | 2.01 | 0.157* |
| PTCA | 19 (17.5) | 85 (25.5) | 2.85 | 0.09* |
| MI | 28 (26) | 89 (26.7) | 0.03 | 0.857* |

* Nonsignificant.

TABLE VI

| | Discharge Diagnoses | | χ^2 | P |
|-----------------------|--------------------------|------------------------------|----------|--------|
| | PD Patients (n = 108) | Non-PD Patients (n = 333) | | |
| | n (%) | n (%) | | |
| Noncardiac chest pain | 81 (75) | 174 (52.3) | 17.45 | 0.0002 |
| Stable angina | 17 (15.7) | 102 (30.6) | | |
| Unstable angina/MI | 10 (9.3) | 57 (17.1) | | |

PD = panic disorder; MI = myocardial infarction.

this, we repeated the above analyses excluding patients with current major depression (n = 17). Results indicate (Table IV.C) that the same proportion of PD patients with suicidal thoughts remains and that PD patients displayed more suicidal ideation than non-PD patients when depressed patients are excluded (P = 0.0001).

Cardiac Comorbidity

Cardiac comorbidity in PD patients is presented in Table V. No significant association between a history of CAD and PD diagnosis was found. A history of myocardial infarction (MI), percutaneous transluminal coronary angioplasty (PTCA), or coronary artery bypass grafting (CABG) was not associated with PD.

Chest Pain Type

Attending ED cardiologists completed the Chest Pain Quality Scale for approximately 85% of the subjects participating in this study. Eighty percent (77/96) of PD patients for whom the scale was completed had either atypical or nonanginal chest pain compared to 61% (174/286) of non-PD chest pain patients ($\kappa^2 = 15.8$; DF = 2; P = 0.0004). Seventy-two percent (70/97) of PD patients had pain judged by cardiologist not to be fully explained by a cardiac pathology in comparison to 48% (133/276) of non-PD chest pain patients ($\kappa^2 = 16.6$; DF = 1; P = 0.0001).

Cardiac Testing and Admission to the CCU in the PD Patients

All of the 108 PD patients had resting ECGs. Sixty-five of these patients (60%) had no abnormalities

(new or pre-existing). Thirty-four PD patients were also submitted to exercise stress testing of which 26 (75%) had both electrically and clinically normal results. Ten PD patients went through nuclear medicine testing. Nine (90%) of these patients had normal results. Finally, of the 12 patients on whom angiograms were performed (16%) were found to have normal coronary arteries.

Sixteen of the 108 PD patients (14.8%) were admitted to the CCU. Three of the admitted patients (18.8%) were discharged with a noncardiac diagnosis.

Discharge Diagnoses

Seventy-five percent of PD patients were discharged from the hospital with a diagnosis of noncardiac chest pain. Patients without PD were significantly more likely to be discharged with a diagnosis of stable angina, MI, or unstable angina than PD patients (Table VI).

Physician Recognition

Physician recognition of the presence of PD in chest pain patients was estimated through two indicators. One was physician's response to the yes or no question on the Chest Pain Quality Scale: is it necessary to refer this patient to a mental health professional for an evaluation or treatment? Cardiologists, blind to psychiatric diagnoses, responded "no" to this question for 61% (58/95) of PD patients. A second indicator of recognition was the mention of PD as a differential diagnosis in the patient's chart at discharge. Reference to panic was only made in the case of two PD patients. Stress or anxiety as a

potential factor contributing to chest pain was acknowledged for 16 of the 108 PD patients (15%).

DISCUSSION

This study indicates that roughly one in four patients consulting an ambulatory ED for chest pain suffer from PD. PD's perceived seriousness in these medical patients is supported by higher psychometrically measured levels of pain, anxiety, depression, agoraphobic avoidance, and concern over bodily sensations than those levels observed in the non-PD chest pain patients. Moreover, PD patients were more likely to suffer from additional psychiatric disorders and report recent suicidal ideation than the non-PD chest pain patients. Although 44% of the PD patients had a documented history of CAD, 80% of the patients had atypical or nonanginal chest pain and 75% were discharged from the hospital with a diagnosis of "noncardiac pain." Despite the differences between PD and non-PD patients and the lack of a clear cardiac explanation for most of these patients' chest pain, physicians (blind to the psychiatric diagnosis) judged it unnecessary to refer most panic patients to a mental health professional for an evaluation or treatment. Finally, chart review indicated that 98% of the PD cases were not specifically recognized.

Prevalence

This is the first PD prevalence study in consecutive (weekday) ED chest pain patients. The observed PD prevalence is consistent with that reported by Wulsin et al³³ (31%) in their preliminary investigation of a sample of 35 atypical chest pain patients who were initially contacted in the ED and consented to be later interviewed in a pain clinic. Moreover, results are comparable to the prevalence of PD in patients with normal angiograms¹⁴ and patients admitted to the CCU.³⁴ Hence, the fact that this research had a large sample, consecutive recruitment, high participation rate as well as interviewers being blind to medical diagnoses and sophisticated inter-rater agreement strengthens the notion that PD is a particularly common occurrence in chest pain patients. Comparing its prevalence in these patients to that found in the general population (1–4%) underlies the fact that physicians treating chest pain patients are highly likely to be confronted with this serious psychiatric disorder.

Psychological Distress

The finding that PD patients displayed significantly more distress on psychological scales (with well-established construct validity) compared to the non-PD chest pain patients supports the notion that PD is a serious specific condition with significant

psychological consequences even in medical patients. This finding argues against PD simply being an interview diagnosis, posed in chest pain patients when no medical cause can be determined in the presence of several physical (mainly cardiovascular) symptoms.

Finally, it should be emphasized that the higher scores displayed by the PD patients on the psychological scales were not attributable to a documented history of CAD.

Suicidal Ideation

Perhaps the most striking finding is that 25% of the PD chest pain patients had thoughts of killing themselves in the week previous to their ED visit. This proportion was significantly higher than that observed in the non-PD chest pain patients, even when controlling for coexisting major depression. Although this is the first report of suicidal ideation in chest pain patients with PD, results are consistent with Weissman et al's 1989 landmark study²⁶ indicating a high relative risk for suicidal ideation/attempt in PD patients participating in the 18,011 subject epidemiological catchment area (ECA) study. These findings again support that panic is a significantly distressful condition. Yet, they run counter to conventional wisdom that suicidal ideation/attempt is the domain of mood disorders.

Our findings as well as those of Weissman et al²⁶ are discrepant from those of at least 2 reports suggesting suicidal ideation and attempts are relatively uncommon in panic disorder outpatients without a mood⁴⁹ or borderline personality disorder.⁵⁰ Differences in the findings may be attributable to the methods used to assess suicidal ideation and also to differences between outpatients with PD and medical/community patients with this disorder. For example, psychiatric outpatients may display less suicidal cognitions/behaviors because they have received an explanation for their symptoms and promised a proven-effective treatment. In contrast, we hypothesize that the medical/community patients may not yet know why they have these disabling symptoms and because they do not know how and when relief will come, they may be hopeless about their condition and suicidal. In addition, although we did not seek AXIS II diagnosis (personality disorders) in this study, the probability that the suicidal ideation in the PD patients of this research was due to an underlying borderline personality disorder is considered low. Borderline personality disorder is more common in young women,⁵¹ thus possibly infrequent in a predominantly male (65%) sample of "suicidal ideation" patients with age averaging 56 years.

We must underline the fact that although suicidal ideation was common in our PD patients, most patients with such thoughts endorsed the statement "I have thoughts of killing myself but would not carry them out." Hence, one can argue that the risk of serious intent to kill oneself is not that significant. Unfortunately, we cannot compare these results to the ECA study as the question most specifically inquiring about suicide in this research: "I felt so low, I wanted to commit suicide" did not specifically ask if the person would act upon his thoughts. However, we argue that admitting to having thoughts of killing oneself, even if one states he would probably not act accordingly, is not a trifling matter. This may especially be true for our sample of PD patients who have other known risk factors for completed suicide: high proportion of white males, age over 50, history of a serious medical problem (CAD) and a recent medical consultation.⁵² In the very least, suicidal ideation is a potent indicator of psychological distress in these patients that should command immediate physician attention.

Psychiatric Comorbidity

Psychological distress in chest pain patients with PD is also underlined by the significantly high rates of psychiatric comorbidity. Studies examining psychiatric comorbidity are rare as they have only been permitted through the abolition of hierarchical exclusionary rules in the DSM-III-R. Nevertheless, results of this study are consistent with those of Carter et al³⁴ in PD chest pain patients in a CCU. Our findings are also consistent with recent data suggesting that 50% or more of anxiety disorder patients seen in mental health settings have additional disorders.²⁴

Cardiac Comorbidity

The finding that 44% of the PD patients in our sample had a prior history of CAD is important. Most previous studies have focused on PD in chest pain patients in whom CAD had been ruled out. However, clinical lore as well as some preliminary work^{36,37} suggest that a subgroup of patients with a history of CAD and unexplained chest pain suffer from panic. The association between PD and CAD is of interest in light of studies that suggest an increased risk of cardiovascular/cerebrovascular complications/mortality from anxiety principally in men.⁵³⁻⁵⁵ Although panic attacks in patients free of cardiovascular disease has not been associated with significant ischemic changes,⁵⁶ this has not been studied in PD patients with a documented history of CAD. Since laboratory induced mental stress causes ischemic changes in CAD patients,⁵⁷ it can be hypothesized that an intense anxiety reaction such as a panic attack in these patients would have similar results.

Per-panic perfusion studies could help clarify the association in these patients.

Physician Recognition

Regardless of the differences between PD and non-PD patients, the low physician recognition of this psychiatric condition is notable. It may suggest physicians are either unaware of what PD is or underestimate its severity to include it as a possible differential diagnosis of chest pain.

On the other hand, PD may simply be a difficult disorder to recognize. PD patients primarily complain of the physical symptoms of their disorder and physicians may exclusively focus on these not suspecting the psychological/psychiatric condition causing them. This may further be complicated by the fact that unlike depressed patients who commonly display affect indicative of their disorder, panic patients may not. Thus, further complicating detection is the fact that you cannot necessarily tell if someone has panic just by "looking" at him. More intense questioning is necessary. In a busy ED, the physician—especially dealing with chest pain, a symptom potentially indicating a life-threatening illness—may feel he does not have time to conduct a thorough mental status exam. Perhaps recently developed screening tools for psychiatric disorders could facilitate the process.⁵⁸ Once the life-threatening illness is ruled out as a cause of chest pain the screens could be administered either by the physician or ED nurse. If a panic syndrome is detected, referral to a mental health professional with a mandate to rule-out PD and implement treatment could be conducted.

Study Limitations

The first limitation concerns the validity of our PD diagnoses in patients with a history of CAD. According to DSM III-R criteria, to make an anxiety or mood disorder, etc., it must not be established that an organic factor initiated and maintained the disturbance (DSM IV criteria are more supple and the psychiatric symptoms must not be a direct cause of a medical condition). The naturalistic characteristics of this study limit us to the cardiac testing prescribed by the attending ED cardiologists. For most of the PD patients, only resting and exercise ECG's were conducted. In absence of more elaborate testing such as angiography or per-panic/per-chest pain nuclear medicine investigations one cannot absolutely exclude that some patients diagnosed with PD had some of their symptoms explained by an underlying CAD. However, cardiologists deal with probability estimates, not absolutes. Although 44% of our PD patients had a prior history of CAD, 75% of the PD patients were discharged from the hospital with non-

cardiac diagnoses based on probability estimates taking into consideration medical examination and results of the tests ordered. However, the remaining 25% (27/108) of the patients were found to have either stable angina, unstable angina, or MI. To respect the DSM III-R exclusion criteria (discussed above) by removing these patients from the sample, the PD prevalence still remains remarkably high (19.5%). However, although excluding the PD patients that were found to have a cardiac disorder at discharge may make theoretical sense, it may not necessarily make clinical sense. To illustrate, patients (in the total sample of 441 subjects) discharged with a diagnosis of "noncardiac chest pain" (n = 255) had significantly higher scores on all psychological scales (Table not presented) than patients discharged from the hospital with a "cardiac chest pain" diagnosis (n = 186) ($P < 0.05$). This result militates for the notion that it is not the cardiac diagnosis that explains the psychopathology in chest pain patients taken as a group. Hence, it is possible that the "cardiac chest pain patients" also found to have PD, truly had this disorder regardless of their medical condition.

Another limit to be addressed is the question of how our results generalize to that of an ED in a general hospital. First, the Montreal Heart Institute is a hospital specializing in cardiac care and, although anyone with cardiovascular symptoms can consult the ED, many patients that do consult have a history of CAD. Hence, the proportion of truly cardiac patients in the total sample may be higher than that in a general ED. However, while awaiting such a study, we can only speculate that PD prevalence in chest pain patients, more common in patients with noncardiac chest pain, may be even higher than that observed in our study.

Secondly, another possible limitation to the generalization is that recruitment was restricted to the ambulatory (walk-in) ED where patients arrive by themselves in contrast to the ED section of the hospital where they arrive by ambulance. For the obvious reason that the patient transported by ambulance for chest pain may be in a too precarious medical condition to participate in the study, we did not focus on this group of patients. Thus the PD prevalence is not based on all ED chest pain patients and results should be interpreted accordingly. Assuming that PD is less common in truly cardiac patients, then the overall prevalence of PD if all ED chest pain patients were included may be lower than what is reported here. Nonetheless, we cannot exclude the fact that several PD patients, significantly concerned by their symptoms, came by ambulance.

Third, patients were French-speaking Caucasians which may limit generalizability to other ED's in Can-

ada and the U.S. However, results are comparable to a preliminary ED study from a large urban center in the U.S. with a majority sample of African-American, English-speaking subjects.³³ Moreover, PD prevalence is similar in African-American and Caucasian samples of the U.S.¹⁵

A final limit to the generalization is the fact that recruitment took place on weekdays. Again, results must be interpreted taking this into account. Since psychologically distressed patients often report worsening of their symptoms at nightfall, we can speculate that a higher proportion of PD patients would have been found had we recruited at this time.

CONCLUSION

In light of the high prevalence of PD demonstrated in this and previous studies, and considering its demonstrated severity and its possible occurrence with CAD, physicians should include it as a differential diagnosis of chest pain. Available, validated screening tools may facilitate and improve physician recognition of this disorder. Recognizing PD early in the consultation process, such as in the ED, may improve management and reduce medical costs for a significant proportion of chest pain patients.

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