

# The Symptom of Chest Pain in Family Practice

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A chart review study was conducted on 109 family practice patients with the complaint of chest pain. Overall and age-sex specific rates were established for chest pain of organic and of unproven etiology. Fifty percent of the chest pain was of unproven etiology after six months follow-up. The highest incidence rate of chest pain was in middle-aged males; they also had the highest incidence of chest pain of unproven etiology. For females, the highest rate of chest pain of unproven etiology was also in the 45 to 64-year age group. The greatest male-female differences for chest pain of unproven etiology were seen in the 15 to 24-year (female predominance) and the 25 to 44-year (male predominance) age groups.

Patients with chest pain of unproven etiology had a significantly greater incidence of anxiety-depression than a control group (matched for age, sex, and practice) and a group of organic chest pain patients. Characteristics of the chest pain were also examined, but there were few differences in the description of the chest pain between the patients with chest pain of organic and unproven etiologies.

Chest pain is a common complaint in family practice. In studies done in the teaching practices of the Department of Family Medicine at the University of Western Ontario, London, Canada, it is the eighth most frequent complaint for men and the 15th most frequent complaint for women.<sup>1</sup> It is always a significant symptom. Whether it is the retrosternal squeezing which may signal coronary heart disease or the submammary stabbing which may signal anxiety, chest pain cannot be ignored.

A review of the family practice literature revealed that follow-up studies of patients with specific complaints, including pain in the chest,

have been done infrequently, although the various clinical entities which present with chest pain are well described.

Bain and Spaulding, in their paper on presenting symptoms,<sup>2</sup> categorized the complaint of chest pain in 500 outpatient medical clinic patients into five groups: cardiovascular — 33 percent, psychiatric — 26 percent, respiratory — 12 percent, musculoskeletal — 12 percent, and remainder — 17 percent. They pointed out the need for extension of the study of symptoms to community practices which are more representative of the general population.

In this study a group of family practice patients presenting with chest pain were followed-up by chart review. The objectives of the study were as follows:

1. To establish the incidence of chest pain as a presenting complaint in the practice population.

2. To determine the age-sex distribution of patients with chest pain of organic and unproven etiology.

3. To test the hypothesis that the incidence of certain problems of living (to be defined later) will be greater in patients with chest pain than in a group of matched controls.

## Methods

All patients with the complaint of chest pain were identified through the computerized register of patient symptoms used in three practices at the St. Joseph's Hospital Medical Centre, London, Ontario. For each patient visit to the practice, an encounter sheet is completed by the health-care professional consulted (staffman, resident, family practice nurse, or social worker). The encounter sheet consists of four boxes. Each box has space for recording three symptoms or complaints, and the associated problem or specific diagnosis. Other basic encounter data, patient name and age, date, and place of encounter, are recorded on the sheet. The symptoms are coded using the Bain and Spaulding code and the problems by using the disease classification of the Royal College of General Practitioners — US Modification (RCGP-US). More details regarding this particular system of data collection in family practice are available in a recent paper by Newell.<sup>3</sup>

The patients with the symptom of chest pain or other chest discomfort [including chest aching, distress, tightness, squeezing, cramps, pressure, soreness, tenderness, stiffness, tingling, burning, numbness, "pins and needles," and weakness (Bain and Spaulding code numbers 311 to 315,

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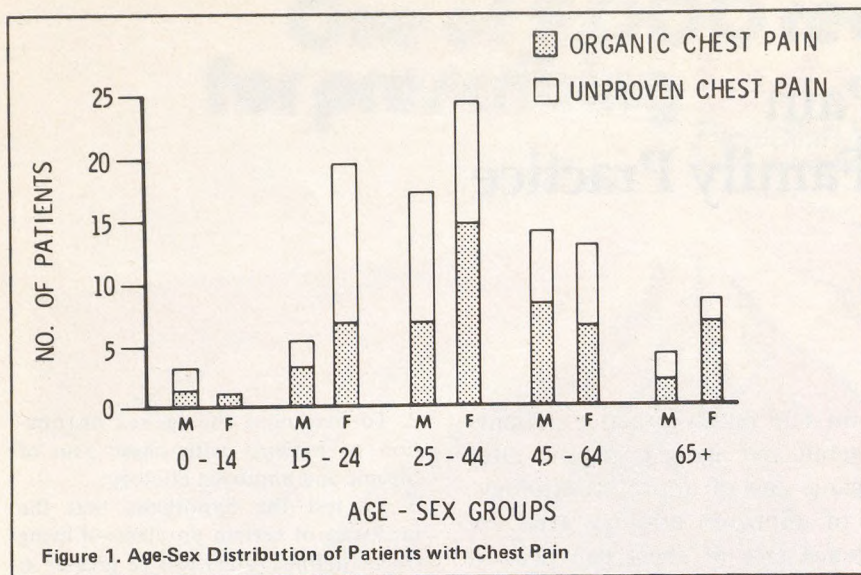


Figure 1. Age-Sex Distribution of Patients with Chest Pain

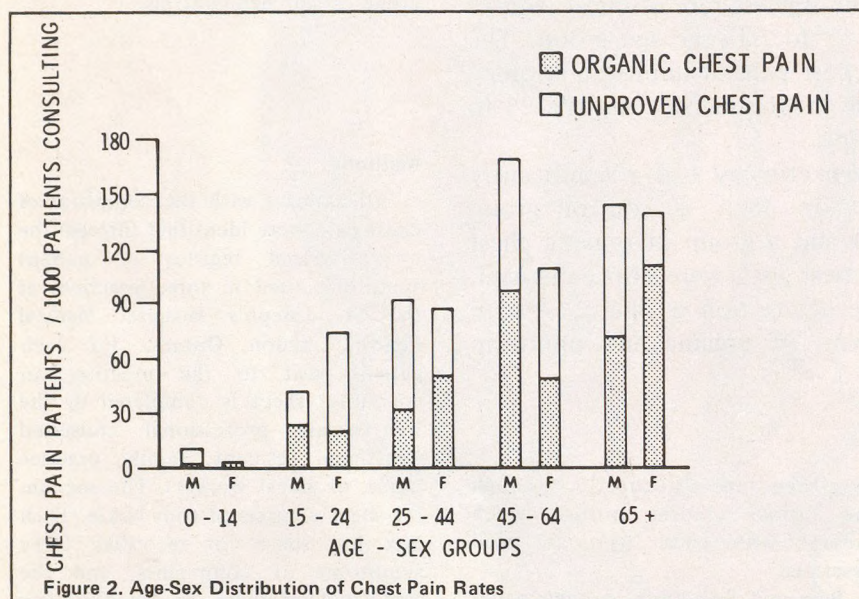


Figure 2. Age-Sex Distribution of Chest Pain Rates

and 317 to 319)] were identified on a computer printout, listing all patients with the symptom of chest pain during a one-year period. During the year, 217 patients were seen with the complaint of chest pain. Because of time constraints, one half, or 109 patients, were selected from the computer printout in lots of ten successively from each practice. The sample, therefore, comprised 37 patients from one practice and 36 from each of the other two.

For each patient a control, free of chest pain during the year under study, was selected. Each control was matched for age group, sex, and practice. This was done by choosing the first chart in the file satisfying the criteria, that followed the chart of the chest pain patient. This method of control selection was felt to be sufficiently random, since family charts are used at the Family Medical Centre and are filed according to time of entrance rather than alphabetically.

The information required from each patient's chart was recorded first on a data sheet and then transferred to an edge punch card for analysis. The data recorded included:

1. Patient identification
2. Sex
3. Age — Five biological age groups were used — 0 to 14 years, 15 to 24 years, 25 to 44 years, 45 to 64 years, and 65+ years.
4. Number of Visits — Both for chest pain and for any problem in the six months following the first chest pain complaint for the study group. The number of visits by the control group was recorded for a similar six-month period. If the patient was not seen following the first episode of chest pain, this was recorded as "no follow-up."
5. Final Etiology — Each chest pain patient was placed into one of three groups, according to the final etiology of the chest pain as recorded in the chart.

- a. Chest pain of organic etiology, with signs, eg, lobar pneumonia, myocardial infarction, fractured rib(s)
- b. Chest pain of organic etiology, without signs, eg, acute bronchitis, hiatus hernia (without radiological confirmation), angina pectoris
- c. Chest pain of unproven etiology, eg, chest pain not yet diagnosed (NYD), intercostal muscle strain, chest wall pain, chest pain secondary to anxiety

If a specific diagnosis was entertained by the attending physician in the patient record, without supporting physical and/or laboratory evidence for the diagnosis, it was recorded as unproven. Chest pain which was felt by the physician to be related to anxiety, depression, or marital dysfunction, etc, was placed in the unproven group unless an organic etiology for the chest pain was recorded.

6. Problems of Living — These were defined as:

- a. *Intrapersonal problems* (those originating within the person). These include anxiety-depression, alcohol abuse, illicit drug use, obesity, and a miscellaneous group which includes such problems as anorexia nervosa, personality disorders, learning disability, mental retardation, and psychoses. The problems were noted if recorded by

the physician in the progress notes, or on the active problem list.

b. *Interpersonal problems* (those problems involving the person and his relationships with other persons in his environment). The specific problems noted included marital dysfunction, family dysfunction, and severe chronic illness in a nuclear family member (ascertained by briefly reviewing the charts of the other family members, as well as the patient's chart).

c. *Material problems*. These include debt, unemployment, job dissatisfaction, or job pressure with one instance each of disability pension and poverty.

7. Characteristics of the Chest Pain — These were recorded from the physician progress notes. The specific details which were noted in the record were:

a. Location — central, left, or right.

b. Radiation — none, arm/neck, or other chest.

c. Quality — sharp, aching, or pressure.

d. Temporal character — intermittent or continuous.

e. Accompanying organic symptoms — fever, sweating, cough, dyspnea, nausea and vomiting, upper respiratory complaints, or general malaise.

It was also noted when no details of the above features were found in the record of the chest pain.

Table 1. Problems of Living in Organic Chest Pain Patients and Controls

Problem of Living	Organic Chest Pain N = 54	Controls N = 54
Intrapersonal (at least 1)	24	23
Anxiety-depression	17	17
Alcohol abuse	1	1
Illicit drug use	1	0
Obesity	11	6
Other*	2	4
Interpersonal (at least 1)	20	13**
Marital dysfunction	10	7
Family dysfunction	8	1
Chronic illness in family	5	7
Material (at least 1)	3	4
Debt	0	0
Unemployment	1	0
Other*	2	4

\*See text for details  
\*\*Difference not significant using  $X^2$  calculation with Yates correction

## Results

Two hundred and seventeen patients with the symptom of chest pain during the study represent a rate of 67.4 patients with chest pain per 1,000 patients consulting in the three practices in a one-year period. Using the mid-year registered population of 4,398, this represents a rate of 49.3 chest pain patients per 1,000 patients at risk in the practices.

Figure 1 shows the age-sex distribution of the patients with chest pain. For simplicity, the patients with chest pain of organic etiology with and

without signs have been combined. Most notable is that 50 percent of all chest pain in the patients studied is of unproven etiology, even after six months follow-up.

Figure 2 illustrates the age-sex distribution of the rates of chest pain, that is, patients with chest pain per 1,000 patients consulting. By using rates, differences in numbers of patients in each age group are eliminated allowing comparison. The highest rate of chest pain occurs in males of 45 to 64 years; in this group, however, the

proportion of unproven chest pain is high, about 40 percent. The greatest male-female difference also occurs in the 45 to 64 age group, but the rate of unproven chest pain in both males and females is highest in this group. The rate of unproven chest pain in males in the over-65 group is equally high, but it should be noted that the numbers of patients in the oldest and youngest age groups are relatively small. The relatively high rates for unproven chest pain in the 15 to 24-year group in females and in the 25 to 44-year group

**Table 2. Problems of Living in Unproven Chest Pain Patients and Controls**

Problem of Living	Unproven Chest Pain N = 55	Controls N = 55
Intrapersonal (at least 1)	39	24†
Anxiety-depression	36	15†
Alcohol abuse	3	2
Illicit drug use	0	0
Obesity	12	10
Other*	3	5
Interpersonal (at least 1)	21	15**
Marital dysfunction	12	11
Family dysfunction	7	4
Chronic illness in family	4	3
Material (at least 1)	10	2
Debt	1	0
Unemployment	2	2
Other*	8	0

\*See text for details  
 \*\*Difference not significant using  $X^2$  calculation with Yates correction  
 † $P < 0.01$   $X^2$  calculation with Yates correction

in males are also notable.

Tables 1 and 2 illustrate the numbers of patients in the organic and unproven chest pain groups with problems of living as compared with their matched controls. There are no statistically significant differences in problems of living between the organic chest pain patients and their controls using the  $X^2$  test with the Yates correction.

When the unproven chest pain group is compared with its control group, we see that there is a signifi-

cantly higher rate of anxiety-depression in the unproven chest pain patients, compared with matched controls. The differences in incidence of other intrapersonal problems (alcohol abuse, drug abuse, and obesity) and in incidence of interpersonal problems are not statistically significant.

The organic chest pain group was compared directly with the group with chest pain of unproven etiology; here the incidence of anxiety-depression was found to be significantly higher in the unproven chest pain group.

Looking at material problems of living, the incidence of eight patients in the uncertain group versus zero in the matched control group is striking; seven of these patients had job dissatisfaction or stress, while in the eighth patient, the problem noted was poverty. The numbers, however, are too small for statistical analysis.

The patient records varied greatly with respect to the amount of detail recorded about the character of the chest pain. The location of the chest pain was recorded in all but 24 of the 109 charts, whereas the presence or absence of radiation was recorded in only 41 charts. Quality of the pain was recorded in 65 charts, and temporal characteristics in 67.

Pain was most often located on the left side (35 patients) and next most frequently centrally (23 patients). There were no differences in location of pain between the organic and unproven etiology groups.

The quality of the chest pain was described as sharp by 36 patients (15 in the organic group and 21 in the unproven group), as aching by seven patients, and as pressure by 17 patients (6 and 11 in the organic and unproven groups respectively).

Accompanying organic symptoms were reported in 51 patients. Cough was the most frequent recorded complaint (15 patients - 12 in the organic group and three in the unproven group). General malaise and shortness of breath were the next most frequent (12 and 11 patients respectively).

## Discussion

The finding in this study that 50 percent of all chest pain is of unproven etiology supports the findings of Cope,<sup>4</sup> who studied 200 consecutive cases of chest pain in a general out-patient clinic, giving special attention to psychogenic factors in the etiology of the chest pain. The majority of his patients were male veterans, ages 20 to 77 years. There were only four females in the study. He showed that in 157 of the 200 patients, the chest discomfort

originated from non-organic sources, most of which were the so-called musculoskeletal type. He was able to demonstrate anxiety relating to the fear of heart disease or cancer in a large percentage of the patients in whom the discomfort did not originate from an organic source. Although restricted mainly to male adult veterans, Cope's study illustrates the association of chest pain with psychogenic factors and suggests the need for further study involving a broader population base, as in a general practice.

With reference to the finding of such a large group of chest pain patients in whom the etiology of the chest pain was not definite, it is interesting to note that reviews and texts on the subject of chest pain, even those written for family practitioners<sup>5,6,7</sup> deal mainly with the organic causes of chest pain and leave consideration of vague chest pain to a few lines at the end of the review or the last chapter in the text.

Is there a relationship between the problems of living and the type of chest pain? In the psychosomatic literature, pain, including pain in the chest, is repeatedly noted to be a substitute for the expression of anxiety, depression, or other emotional conflict.<sup>8-11</sup> Burns<sup>12</sup> has shown that certain factors in the backgrounds of patients determine the presence of localizing symptoms to the chest in neurotic depression.

Anxiety-depression is seen as the only problem of living which was present for significantly more patients with chest pain of unproven etiology. It is likely that a certain number of patients had anxiety which was directly related to the occurrence of chest pain; similar numbers of patients with chest pain of organic etiology would probably manifest this type of anxiety and so the bias is probably constant. It was the observer's impression, however, that most of the anxiety-depression recorded in the charts of the chest pain patients predated the occurrence of chest pain or was related to factors other than the chest pain. An adjunctive method to the chart review might be to interview the patient at a time distant from the episode of chest pain to gain another perspective on the problems of living of the patient at that time.

Although the incidence of material

problems in the patients with chest pain of unproven etiology is impressive, it may reflect the tendency of the attending physician to explore possible sources of conflict or stress with a patient who presents with chest pain (or other symptoms) of uncertain etiology. This aspect requires further investigation before firm conclusions are warranted.

A particular difficulty in this study was the lack of rigid criteria defining problems of living such as anxiety-depression, marital dysfunction, and family dysfunction. The recorded incidence of these problems covers a wide range, from mild to severe depending on the attitudes of the individual physician. Any bias introduced by this factor is constant since the patients were matched with controls within each of three practices and thus were cared for by the same group of physicians.

The high incidence of non-recording of descriptive details of the chest pain does not allow any firm statements to be made about the kind of chest pain which is likely to be of uncertain etiology. However, Cope's finding of a high incidence of left chest pain and a low incidence of right chest pain in patients with non-organic chest pain is supported.

Generally, the charts of the unproven chest pain group had a higher rate of recorded details of the pain. This may reflect a tendency to write down more detail about the pain if the patient's presentation of the pain does not allow the physician to prove his initial hypothesis quickly.

Also notable is the finding that more patients in the unproven group described their pain as sharp or pressing than did the patients in the organic group. As might be expected, organic symptoms such as fever and cough are present in more patients in the organic group, while vague symptoms such as dyspnea and general malaise are present in both groups.

Another problem encountered in a chart review, without the validation of the recording physician, and which has been alluded to above is the great difference in quantity and quality of recording among individual physicians. Validity studies in the Department of Family Medicine at the University of Western Ontario show that an average of 1.6 problems are recorded in the chart for every 2.5

problems dealt with in the patient encounter. Again, matching patients and controls within a practice should keep this bias constant. The probability of recording chronic, continuing problems of living is also enhanced by the fact that over 90 percent of all chest pain patients and their controls were seen at least one to five times in the six months following the initial chest pain visit.

Further studies of symptoms in family medicine are needed to learn more about the patient who presents with an undifferentiated complaint. Specifically, more study of the patient with a chest pain which does not fall into the pattern of a well-defined clinical entity is required.

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