

## Musculoskeletal Diagnoses for Patients with Non-cardiac Long-Standing Chest Pain

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### ABSTRACT

**Background:** Three quarters of patients with non-diagnosed chest pain after a normal cardiac evaluation continue to complain from residual pain. By careful history taking and physical examination, number of those patient diagnosed to have musculoskeletal pain. The proper management will help to reduce the socio-economic consequences due to fear and anxiety of undiagnosed coronary artery diseases.

**Aim:** To highlight one of the other differential diagnoses of ischemic chest pain.

**Patients and Method:** Fifty patients with chest pain were involved. All these patient had chronic chest pain and normal all cardiac evaluations. These patients were examined by rheumatologist to reach the final diagnosis.

**Results:** The mean age was  $46.6 \pm 14$  standard deviation. About 40% of the patients were complained from left side chest pain. The final diagnosis was either muscular pain, shoulder problem, cervical radicular pain, costochondritis, or fibromyalgia.

**Conclusion:** Musculoskeletal chest pain is not uncommon and an important differential diagnosis of chest pain for patients presented to cardiac clinic. After exclusion of cardiac causes, a high index of suspicion and an appropriate approach is recommended to diagnose and treat these conditions to improve patients' quality of life.

**Keyword:** chest pain, ischemic heart disease, musculoskeletal pain, shoulder diseases.

### INTRODUCTION

Patients who present to the office with chest pain are a diagnostic challenge due to many possible etiologies, including life-threatening conditions<sup>(1)</sup>.

The key for a definitive diagnosis is a precise and a detailed clinical history. The diagnosis can be achieved by history alone in substantial number of patients. A careful physical examination and special tests should be done to confirm the diagnosis and to exclude other diagnoses. Almost 70 - 75% of patients with non-diagnosed chest pain next to normal cardiac assessment remain suffering from residual discomfort with significant individual and socioeconomic concerns due to fear and anxiety of undiagnosed coronary heart diseases, loss of working capability, and repeated hospitals' admissions<sup>(2)</sup>.

Differential diagnoses of chest pain include cardiac, pulmonary, musculoskeletal, gastrointestinal or psychological disorders. Musculoskeletal causes accounts for 5–20% of consultations to chest pain clinics<sup>(3)</sup>.

The ECG is the initial test for evaluation of a patient presents with a chest pain. An echocardiography is an essential study to assess cardiac function and anatomy<sup>(4)</sup>. ECG stress test is a useful test to exclude ischemic heart disease in patients with low and intermediate pre-test probably. In addition to the classic Diamond and Forrester classes<sup>(5)</sup>.

The likelihood of chronic coronary syndrome decreases by a normal ECG exercise test or normal calcium score by CT, keeping in mind false negative ECG exercise test especially in the absence of a diagnosis that explains patients' symptoms<sup>(6)</sup>.

If clinical assessment alone cannot exclude coronary artery diseases, the diagnosis can be established by non-invasive tests. The current Guidelines recommend the use of functional imaging or anatomical imaging by CT coronary angiography as an initial test for coronary artery diseases diagnosis<sup>(7)</sup>.

An anatomic assessment by CTCA or invasive coronary angiography should be considered in cases of non-diagnostic findings or a strong suspicion conflicting with stress tests findings.

### AIM OF THE STUDY

To highlight one of the other differential diagnoses of ischemic chest pain.

### PATIENTS AND METHOD

#### Study design:

This was a cross-sectional descriptive study conducted in the Cardiac and Rheumatological clinics in Al Sadat Teaching Hospital in Basrah (Iraq), from January 2021 till June 2022.

**Ethical consideration:**

The study was approved by the Ethics Board of the College of Medicine, University of Basrah, Institutional Review Board. The ethics approval and written agreement to participate in the study had been signed by all patients and controls.

**Sample selection:**

Seventy patients with chest pain were involved in the study. Patients included in the study were: females and males at age more than 20 years who have long history of chest pain with normal all cardiac evaluations. Exclusion criteria: patients with an acute chest pain, previous history of diagnosed ischemic heart disease, prior Coronary Artery By-pass Grafting or Percutaneous Coronary Intervention and patients with autoimmune diseases like rheumatoid arthritis and systemic lupus erythematosus (SLE).

These patients were consulted the Cardiac Clinic for long standing unremitting chest pain. They were well examined by cardiologist. Cardiac evaluation by ECG, CXR and echocardiography was done for all participants. Some of them were sent for ETT, CTCA and/or invasive coronary angiography according to their cardiac risk factors (6). After confirmation of normal cardiac status, they were referred to the Rheumatological Clinic for further workup. Rheumatological evaluation was done by clinical, precise clinical examination of joints and muscles of neck, shoulder, thorax and thoracic spine, including: “active range of motion, manual palpation for muscular tenderness and examination of tender points for diagnosis of fibromyalgia, and some participants need special tests to help in reaching the final diagnosis like radiographic image and nerve conductive study”.

Twenty patients were excluded from the study, thirteen of them had preexisted coronary artery disease, five of them had previous diagnoses of rheumatoid arthritis and two of them lost follow up.

**Statistical Analysis**

Statistical analysis was done using version 22 of SPSS software. The interquartile range (IQR) and median for quantitative variables were provided.

**RESULTS**

Table 1 demonstrates the demographic features of our participants. The mean age was 46.6±14 SD and most of the participants (94%) were at age <65 year. Most of them were females (64%).

**Table (1): Demographical feature of participants**

Variable	Number	%
Age group		
20-45yr	22	44
46-65yr	25	50
>65yr	3	6
Mean ±SD	46.6±14SD	
Total	50	100
Gander		
Male	18	36
Female	32	64
Total	50	100
Smoking		
Yes	16	32
No	34	68
Chronic diseases		
No disease	22	44
HT	21	42
DM	8	16
Others	4	8

The participants presented with chest pain at different sites but about 40% had left sided chest pain which mimic cardiac chest pain as demonstrated in table 2 and 3.

**Table (2): Spectrum of clinical presentations**

Presentation	Number	%
Atypical chest pain	9	18
Left side chest pain	20	40
Anterior chest pain	9	18
Central chest pain	3	6
Chest pain radiated to left arm	9	18
Total	50	100

**Table (3): Clinical presentation among males and females**

Presentation	Women		Men	
	No.	%	No.	%
Atypical chest pain	6	66.7	3	33.3
Left side chest pain	15	75	5	25
Anterior chest pain	3	33.3	6	66.7
Central chest pain	3	100	0	0.0
Chest pain radiated to left arm	5	55.6	4	44.4

Cardiac evaluation was done by different methods as show in table 4.

**Table (4): Cardiac evaluation**

Test	Number	%
ECG and echo only	17	34
ECG, echo and ETT	12	24
ECG, echo and CTCA	8	16
ECG, echo and coronary angiography	13	26
Total	50	100

After full evaluations the final diagnosis was made and most of the participants had shoulder tendonitis (34%), and muscular chest pain (24%), as show in table 5.

**Table (5): Final diagnosis**

Diagnosis	FMS	Shoulder tendonitis	Cervical radiculopathy	Frozen shoulder	Muscular pain	Costochondritis
No.	7	17	9	1	12	4
%	14	34	18	2	24	8

## DISCUSSION

The diagnosis and treatment of chest pain emphasize the complex interplay of the source of the pain, co-existing disease and other painful conditions, psychological factors, gender, and genetics. It is important to note that cardiac (i.e., acute coronary syndrome) and musculoskeletal chest pain syndromes can present similarly. So the diagnosis depends on precise history and examination. Most chest wall pain syndromes are clinical diagnoses, and there are no gold standards for confirmatory diagnostic testing <sup>(3)</sup>.

In this study most of patients were females, and most of them were nonsmoker and have no chronic diseases. So they have low risk for cardiac diseases. Most of the participants had left chest pain which highly mimic cardiac chest pain and that make the patient worry and consult a doctor. Majority of patients finally diagnosed to have either muscular pain or shoulder problems.

## RESULTS COMPARED TO THE LITERATURE

In the general population, the point prevalence of non-cardiac chest pain may be up to 25% <sup>(8)</sup>. Most of previous studies on chest pain were carried on patients in emergency department <sup>(9-11)</sup>. All these studies deal with patients suffering from acute chest pain. According to our knowledge there is no previous study that concerned the chronic chest pain or patients outside the Emergency Department.

## CONCLUSION

Musculoskeletal chest pain is not uncommon and an important differential diagnosis of chest pain for patients presented to a cardiac clinic. After exclusion of cardiac causes, a high index of suspicion and an appropriate approach is recommended to diagnose and treat these conditions to improve patients' quality of life.

**Source of Funding:** The authors have no sources of funding, so it is self-funding research.

**Competing Interests Statement:** The Author(s) declare(s) that there is no conflict of interest.

## REFERENCES

- Rui P, Okeyode T (2016):** National Ambulatory Medical Care Survey: national summary tables. Available at: [https://www.cdc.gov/nchs/data/ahcd/namcs\\_summary/2016\\_namcs\\_web\\_tables.pdf](https://www.cdc.gov/nchs/data/ahcd/namcs_summary/2016_namcs_web_tables.pdf) (Accessed on February 26, 2021).
- Ockene I, Shay M, Alpert J et al. (1980):** Unexplained chest pain in patients with normal coronary arteriograms: a follow-up study of functional status. *N Engl J Med.*, 303:1249–1252.
- Knockaert D, Buntinx F, Stoens N et al. (2002).** Chest pain in the emergency department: the broad spectrum of causes. *Eur J Emerg Med.*, 9:25–30.
- Daly C, Norrie J, Murdoch D et al. (2003):** TIBET (Total Ischaemic Burden European Trial) study group. The value of routine non-invasive tests to predict clinical outcome instable angina. *Eur Heart J.*, 24:532–540.
- Diamond G, Forrester J (1979):** Analysis of probability as an aid in the clinical diagnosis of coronary-artery disease. *N Engl J Med.*, 300:1350-1358.
- Juhani K, William W, Antti S et al. (2019):** ESC guidelines for the diagnosis and management of chronic coronary syndromes: The Task Force for the diagnosis and management of chronic coronary syndromes of the European Society of Cardiology (ESC). *Eur Heart J.*, 41:407-477.
- Siontis G, Mavridis D, Greenwood J et al. (2018):** Outcomes of noninvasive diagnostic modalities for the detection of coronary artery disease:network metaanalysis of diagnostic randomised controlled trials. *BMJ.*, 360:k504.
- Fass R, Achem S (2011):** Noncardiac Chest Pain. *Epidemiology, Natural Course and Pathogenesis. J Neurogastroenterol Motility*, 17(2): 110-23.
- Stochkendahl M, Christensen H, Vach W et al. (2008):** Diagnosis and treatment of musculoskeletal chest pain: design of a multi-purpose trial. *BMC Musculoskelet Disord.*, 9: 40.
- Buntinx F, Knockaert D, Bruyninckx R et al. (2001):** Chest pain in general practice or in the hospital emergency department: is it the same? *Fam Pract.*, 18(6):586-9. doi: 10.1093/fampra/18.6.586.
- Buntinx F, Knockaert D, Bruyninckx R et al. (2001):** Chest pain in general practice or in the hospital emergency department: is it the same? *Fam Pract.*, 18:586–89.