

Original article:

Study of clinical profile of patients presenting with chest pain in the emergency department of tertiary care center

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Abstract:

Introduction: Chest pain is the third most common reason for visits to the emergency department in the United States, resulting in 6 to 7 million emergency visits each year.

Material and methods: This is an observational study which aims to describe epidemiology and clinical profile of patients presenting with chest pain in Jaslok Hospital & Research centre. The study was conducted on outpatients as well as inpatients admitted in an urban tertiary care hospital during Oct 2020 to June 2022

Study included the patients admitted at Jaslok Hospital & Research Centre or patients coming to Jaslok Hospital EMS, according to the inclusion and exclusion criteria

Results and Conclusion: The most common causes of non-traumatic chest pain in the present study was found to be cardiovascular diseases (47.8%) followed by gastrointestinal diseases (30%), pulmonary diseases (12.2%), Neuromuscular diseases (6.7%), Psychological disease (3.3%). The majority of the patients were in the age group of 51-70 years. The probability of getting admitted was higher in cardiovascular diseases as compared to non-cardiovascular diseases.

Keywords: Chest pain, pulmonary disease, cardiovascular disease

Introduction:

Chest pain is the third most common reason for visits to the emergency department in the United States, resulting in 6 to 7 million emergency visits each year.^[1, 2, 3] Some of these patients will have serious, life-threatening causes of their pain, such as an acute myocardial infarction (AMI), unstable angina, pulmonary embolus, aortic dissection, and pneumothorax. Delay in diagnosis and appropriate treatment can lead to increased morbidity and mortality in patients.^[3]

Chest pain can be produced by any musculoskeletal disorder involving the chest wall or the nerves of the chest wall, neck, or upper limbs. Costochondritis (Tietze's syndrome) usually causes tenderness of the costochondral junctions, and it is relatively common. Cervical radiculitis may manifest as a prolonged or constant aching

discomfort in the upper chest and limbs. The pain may be exacerbated by motion of the neck. Pain in a dermatomal distribution can also be caused by cramping of intercostal muscles or by herpes zoster.^[4]

Patients of Chest Pain of psychiatric origin have attacks of chest pain, which is accompanied by symptoms such as palpitations, diaphoresis, tremor, dyspnoea, choking, nausea, dizziness, derealization or depersonalization, fear of losing control or dying, paraesthesia's, chills, or hot flushes.^[5]

Material and methods:

This is an observational study which aims to describe epidemiology and clinical profile of patients presenting with chest pain in Jaslok Hospital & Research centre.

The study was conducted on outpatients as well as inpatients admitted in an urban tertiary care hospital during Oct 2020 to June 2022

Study included the patients admitted at Jaslok Hospital & Research Centre or patients coming to Jaslok Hospital EMS, according to the inclusion and exclusion criteria

1.Inclusion Criteria:

1. Patients presenting with chest pain as chief complaint of any duration.
2. Patients aged ≥18 years and all genders.
3. Patients who are willing to participate in the study.

2.Exclusion Criteria:

1. Patients with history of trauma.
2. Patients not willing to give consent.

Results:

In our study total number of 90 patients was included, out of which 29 patients (32.2%) were females and 61 patients (67.8%) were males. The maximum number patients were in the age group 51-60 years & 61-70 years i.e., 20 (22.2%) in both groups.

In the study amongst total participants, 85 patients (94.4%) were from urban area, 5 patients (5.6%) were from rural area.

Table 1: Onset of Chest Pain

Duration of Chest Pain	Cardiac Pain		Total	P Value
	Yes	No		
<3 hours	3 (6.9%)	10(21.3%)	13 (2%)	0.004
<24 hours	11 (25.6%)	24 (51.1%)	35 (38.9%)	
24 - 48 hours	18 (41.9%)	6 (12.8%)	24 (26.7%)	
>48 hours	14 (32.6%)	17 (36.2%)	31 (34.4%)	
Total	43	47	90	

Table 2: Cause of Chest Pain in Participants

Diagnosis	Frequency	Percentage
Cardiac	43	47.8
Pulmonary	11	12.2
Gastrointestinal	27	30.0
Psychological	3	3.3
Neuromuscular	6	6.7

Onset of chest pain was acute in 59(65.56%) patients, out which 29(67.5%) patients had cardiovascular cause of chest pain, 3 patients (6.9%) of cardiac chest pain had STEMI for which primary PCI was done. Amongst total 90 participants, 43 (47.8%) patients had cardiac cause of chest pain, 11 (12.2%) patients had pulmonary cause of chest pain, 27(30%) had gastrointestinal cause, 3 (3.3%) had psychological cause & 6 (6.7%) had neuromuscular cause of chest pain.

Table 3: Age Wise Distribution of Patients in Cardiac and Non-Cardiac Chest Pain

Age group	Cardiac Cause of Chest pain		Non-Cardiac Cause of Chest pain	
	Frequency	Percentage	Frequency	Percentage
18-30 years	1	2.33%	11	23.40%
31-40 years	3	6.98%	11	23.40%
41-50 years	5	11.63%	10	21.28%
51-60 years	14	32.56%	6	12.77%
61-70 years	16	37.21%	4	8.51%
71-80 years	2	4.65%	5	10.64%
>80 years	2	4.65%	0	0
total	43	100%	47	100%

Table 4: Gender Wise Distribution of Patients in Cardiac and Non-Cardiac Chest Pain

Gender	Cardiac Cause of Chest pain		Non-Cardiac Cause of Chest pain	
	Frequency	Percentage	Frequency	Percentage
Male	32	74.4%	29	61.70%
Female	11	25.6%	18	38.30%
Total	43	100%	47	100%

In our study it was observed that with the increasing age the incidence of cardiovascular disease increases, the maximum number of patients in cardiovascular cause of chest pain was from the age group 61-70 years i.e., 16 patients (37.21%), where in non-cardiovascular diseases the maximum number of patients were from age group 18-40 years i.e., 22 patients (46.8%).

In our study the incidence of cardiovascular diseases was higher in males i.e., 32 patients (74.4%) than in females i.e., 11 patients (25.6%)

Table 5: Characteristics of Chest Pain

Diagnosis	Aching	Burning	Constricting	Dull	Pleuritic	Sharp	Tearing	Total
Cardiac	0	0	22 (51.1%)	21 (48.8%)	0	0	1 (0.1%)	43
Pulmonary	0	0	2 (18.2%)	3 (27.3%)	6 (54.5%)	0	0	11
Gastrointestinal	0	24 (88.8%)	0	1 (3.7%)	0	2 (7.4%)	0	27
Psychological	0	0	0	3 (100%)	0	0	0	3
Neuromuscular	1 (16.7%)	0	0	2 (33.3%)	0	3 (50%)	0	6

In our study amongst the participants, 22 patients (51.1%) had constricting type & 21 patients (48.8%) had dull type of chest pain in cardiovascular diseases. In Pulmonary diseases maximum patients i.e. 6 patients (54.5%) had pleuritic type of chest pain. Gastrointestinal cause was mainly associated burning type of chest pain, which was recurrent in nature, 24 patients (88.8%) had burning type of chest pain.

Table 6: Cardiac Cause of Chest Pain

Diagnosis		Frequency	Percent
Cardiac	NSTEMI	10	11.11
	RHD (Mitral Stenosis)	1	1.11
	Stable Angina	9	10.00
	STEMI	14	15.56
	Unstable Angina	6	6.67
	Cardioouropathy	1	1.11
	Atrial fibrillation	1	1.11
	Aortic Dissection	1	1.11

Amongst the total participants, Cardiac cause of chest pain was the most commonly presenting symptom- 43(47.8%), out of which 14 (15.56%) patients had STEMI,10 (11.11%) patients had NSTEMI, 9 (10%) had stable angina, 6 (6.67%) had unstable angina.

Table 7: Pulmonary Cause of Chest Pain

Diagnosis		Frequency	Percent
Pulmonary	Interstitial Lung Disease	1	1.11
	Pulmonary thromboembolism	2	2.22
	Pneumonia	4	4.44
	Pleural effusion	2	2.22
	Asthma Exacerbation	2	2.22

Amongst the total participants, the pulmonary causes of chest pain were in 11 patients (12.2%) patients, out of which 4 patients (4.4%) had pneumonia which was most common.

Table 8: Incidence of Risk Factors in Patients with Chest Pain

Risk Factor	Cardiac causes	Non- cardiac causes
Tobacco	24 (55.81%)	18 (38.3%)
Alcohol	17 (39.53%)	14 (29.79%)
Asthma	1 (2.32%)	2 (4.26%)
DM	27 (62.8%)	8 (17.02%)
HTN	34 (79.7%)	10 (21.28%)
CAD	10 (23.26%)	3 (6.40%)
CVD	0	1 (2.12%)
Dyslipidaemia	19 (44.19%)	6 (12.77%)

Discussion:

It was observed that among the patients who had cardiac cause of chest pain, 34 patients (79.7%) were hypertensive, 27 patients (62.8%) had diabetes, 10 patients (23.26%) had coronary artery disease. Among the patients who had non-cardiac chest pain, 10 patients (21.28%) had hypertension, 8 patients (17.02%) had diabetes, 3 patients (6.40%) had coronary artery disease.

It was observed that tobacco & alcohol abuse was associated with cardiac cause of chest pain, as cardiac issue being the cause of chest pain was more in tobacco & alcohol users as compared to non-cardiac cause.

In our study out of 90 participants 29 Patients (32.2%) were females and 61 patients (67.8%) were males. The maximum number patients were in the age group 51-60 years & 61-70 years i.e., 20 (22.2%) in both groups. In our study it was observed that with the increasing age the incidence of cardiovascular disease increases, the maximum number of patients in cardiovascular cause of chest pain was from the age group 61-70 years i.e. 16 patients (37.21%), where in non-cardiovascular diseases the maximum number of patients were from age group 18-40 years i.e. 22 patients (46.8%). In our study the incidence of cardiovascular diseases were higher in males i.e. 32 patients (74.4%) than in females i.e. 11 patients (25.6%).

In the study conducted by Bosner et al (2009) out of 1212 patients the majority were women (55.9%) than men. The Mean age was 59 years, ranging from 35 to 93 years. Women were on average older than men.^[63]In the study conducted by Sharma et al.^[6] (2019) had 271 patients, in which 63.1% were males and 36.9% were

females. The age of the study participants ranged from 18 years to 85 years, with maximum number of patients (31%) were in the age group of 36-45 years. In their study the incidence of cardiovascular cause of chest pain increases with age as 78.6% patients were above 46 years of age. [6] In study conducted by Paichadze et al. in 2015, where 58% were males and 39% were females. Almost 35% of patients admitted with chest pain symptoms were in the 30-45 age group. [7]

In our study amongst the participants, 22 patients (51.1%) had constricting type & 21(48.8%) had dull type of chest pain in nature in cardiovascular diseases. In Pulmonary diseases maximum patients i.e 6 patients (54.5%) had pleuritic type of chest pain. Gastrointestinal cause was mainly associated burning type of chest pain which was recurrent in nature, 24 patients (88.8%) had burning type of chest pain. While in study conducted by Zaimi et al [8](2014) the most common type of pain was squeezing in 39.6% patients and burning pain in 11.5% patients.

In our study onset of chest pain was acute in 59 patients (65.56%), out which 29 patients (67.5%) had cardiovascular cause of chest pain which was the most common cause of chest pain with the P value of 0.004 which was statistically highly significant. Amongst total 90 participants, 43 patients (47.8%) had cardiac cause of chest pain, 11 patients (12.2%) had pulmonary cause of chest pain, 27 patients (30%) had gastrointestinal cause, 3 patients (3.3%) had psychological cause & 6 patients (6.7%) had neuromuscular cause of chest pain. In Cardiovascular causes 14 patients (15.56%) had STEMI, 10 patients (11.11%) had NSTEMI, 9 patients (10%) had stable angina, 6 patients (6.67%) had unstable angina.

In our study, participants who had cardiac cause of chest pain had a higher BMI. The mean BMI in patients with cardiac cause of chest pain was $28.04 \text{ kg/m}^2 \pm 2.85 \text{ kg/m}^2$ & mean BMI in patients with non-cardiac chest pain was $26.22 \text{ kg/m}^2 \pm 3.26 \text{ kg/m}^2$ There was a statistically significant difference in BMI with a 'P' value of 0.006. In a study performed by Bogers et al. [9] (2007) Obesity was clearly associated with increased mortality and adverse health outcomes, including coronary heart disease (CHD). In the study conducted by Khan et al. [10] (2018) obesity was associated with shorter longevity and significantly increased risk of cardiovascular morbidity and mortality compared with normal BMI. Overweights were associated with significantly increased risk of developing cardiovascular disease at an earlier age, resulting in a greater proportion of life lived with CVD morbidity. In our study, it was observed that among the patients who had cardiac cause of chest pain, 34 patients (79.7%) were hypertensive, 27 patients (62.8%) had diabetes, 10 patients (23.26%) had coronary artery disease.

Conclusion:

The most common causes of non-traumatic chest pain in the present study was found to be cardiovascular diseases (47.8%) followed by gastrointestinal diseases (30%), pulmonary diseases (12.2%), Neuromuscular diseases (6.7%), Psychological disease (3.3%). The majority of the patients were in the age group of 51-70 years. The probability for getting admitted was higher in cardiovascular diseases as compared to non-cardiovascular diseases.

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