

Characteristics of Chest Pain Associated with Other Symptoms Experienced by Coronary Artery Disease Patients

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Abstract

Cardiovascular diseases (CVDs) take the lives of 17.7 million people every year, 31 percent of all global deaths. There is considerable overlap in chest pain of cardiac as well as non-cardiac origin. However, vigilant evaluation of characteristics of chest pain in history taking may help overcome this dilemma. This study was sought to identify characteristics of chest pain associated with other symptoms which are due to cardiac reason and to find out association between characteristics of chest pain and other symptoms with the selected demographic variables. The study was conducted among 60 patients of coronary artery disease (CAD). Characteristics of chest pain associated with other symptoms were assessed by structured questionnaires administered through interview schedule. In this study, 40 percent samples had pain on retrosternal side and 20 percent on left side of chest, while 31.67 percent samples had pain location other than retrosternal and left side of chest; 46.67 percent samples had characterized their pain as heaviness, 30 percent as choking, 20 percent felt burning pain; 42 percent had pain duration of 1-30 minutes, 77 percent samples had pain severity >7 on 0-10 scale, 41.67 percent samples had pain radiation to left arm, 20 percent on right arm, 25 percent to neck, 20 percent having no radiation of pain. 73.33 percent samples had diaphoresis as associated symptoms, 58.33 percent had dyspnea, 53.33 percent had nausea & vomiting, 60 percent had weakness/fatigue. To conclude, chest pain of cardiac origin can occur anywhere in chest and abdomen, which is usually severe in nature and characterised by choking and heaviness usually associated with nausea, dyspnea, diaphoresis and weakness. So, patient should be carefully evaluated to prevent mis-diagnosis.

Key words: Coronary artery disease, Chest pain, Characteristics of chest pain.

The chest pain history, physical examination, determination of coronary artery disease (CAD) risk factors, and the initial electrocardiogram help determine the probability of acute myocardial infarction (AMI) or acute coronary syndrome (ACS) in patients with chest pain. However, conflicting data exist about the usefulness of the chest pain history and ability to determine which components are most useful.

Cardiovascular diseases (CVD) especially coronary heart disease, have assumed epidemic proportions worldwide. Globally, CVD led to 17.5 million deaths in 2012 (Mc Carthy et al, 1993) More than 75 percent of these deaths occurred in developing countries. In contrast to developed countries, where mortality from CHD is rapidly declining, it is increasing in developing countries (Pope et al, 1998). This increase is driven by industrialisation, urbanisation, and related lifestyle changes and is called epidemiological transition (Gupta et al, 2012) This transition affected the developed world in the early 20th century and

spread to developing countries 50 years later (RGI, 2011).

In India, more than 10.5 million deaths occur annually, and it was reported that CVD led to 20.3 percent of these deaths in men and 16.9 percent deaths in women (RGI, 2009). According to 2010-2013 RGI data, proportionate mortality from CVD increased to 23 percent of total and 32 percent of adult deaths in years 2010-2013. The office of the RGI has periodically reported data on cardiovascular mortality rates in India. In 1980s and 1990s it was reported that CVD led to 15 percent to 20 percent of deaths in the country. An increasing trend in proportionate CVD mortality has been reported, with 20.6 percent deaths in 1990, 21.4 percent in 1995, 24.3 percent in 2000, 27.5 percent in 2005, and 29.0 percent in 2013.

The characteristic symptom of ischaemic heart disease is chest pain, which may radiate to the shoulders, arms and neck (Natkin et al, 2015). However, cardiac pain may extend to the jaws and cause toothache (De Oliveria Franco et al, 2005; Davies et al, 1985; Kreimer et al, 2007). It has been stated that craniofacial pain was the sole symptom

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of cardiac ischaemia in 6 percent of patients. A significant number of patients face lethal or potentially lethal complications due to the misdiagnosis of referred cardiac pain to the craniofacial region (Spalding et al, 2007; Rothwell, 2009). Different studies of emergency department patients revealed that the mortality rate increases significantly in patients who have never developed chest pain compared with patients who had chest pain as their chief complaint (Mc Carthy et al, 1993; Pope et al, 1998; Hertlitz et al, 1992). It is crucial to recognise the actual source of the pain promptly, not the region of the pain, to refer the patient for appropriate therapy and avoid unnecessary treatments (Fuster & Kelly 2010; Kreiner et al, 2007). Chest pain, however, is grounded on a wide spectrum of causes, ranging from totally harmless to immediately life-threatening. In coronary artery disease “The history is Strongly Recommended” as the most essential part of the initial evaluation. A careful history remains the cornerstone for diagnosis of stable angina, it is possible to make a confident diagnosis in the majority of patients based on the history alone.

Objectives

1. To identify characteristics of chest pain associated with other symptoms experienced by coronary artery disease patients.
2. To find out association between characteristics of chest pain and other symptoms with the selected demographic variables.
3. To develop an educational pamphlet.

Methodology

A quantitative research study was conducted on 60 patients of coronary artery disease admitted in Medicine ward of PGIMS, Rohtak from 1 to 31 December 2017. The study was approved by ethical committee of the hospital. Informed consent was taken from each sample. Data was collected using the structured questionnaire. The tool was validated by experts and checked for reliability via test re test method. All patients were requested to answer the questionnaire which is divided into two parts: demographic data and detailed symptoms. Demographic variables included were age, sex, dietary pattern, habits, history of past disease, concomitant disease, height, weight, body mass index (BMI). The data was analysed using descriptive and inferential statistics.

Pilot Study

Pilot study was conducted in BPS Khanpur Women’s Medical College during 6 to 12 November 2017. Purposive sampling technique was adopted. Confidentiality was as-

sured to all the study subjects. Sample size was 06. Data analysis was done by using descriptive and inferential statistics.

Findings of the pilot study: 66.7 percent samples belonged to the age group of 60-80; 83.33 percent of samples were male; 83.3 percent samples were vegetarian. All samples (100%) indulged in some form of smoking; 50 percent of samples had no past history of any type of concomitant disease; 33.3 percent had history of hypertension and 16.6 percent were having history of diabetes mellitus. Only 16.6 percent samples fall in obesity group, 83.3 percent had normal BMI.

Pain starts in 33.3 percent cases from left sides while in 16.7 percent from sternum side; rest of 33.3 percent were having pain all over the chest; 16.6 percent had pain on right hand which radiated to right side of chest; 50% samples had burning pain. 66.7 percent had pain duration of less than 30 min; 16.6 percent samples had pain > 7 on pain scale of 1 to 10. 33.7 percent had pain of 1-3 on pain scale. Pain radiates to left and right arms equally. Half the samples (50%) directly approached hospital for treatment; 66.7 percent samples got admitted within 30 min of pain occurrence.

Results

41.67 percent of subjects were in the age group of 61-80 years followed by 35 percent of 41-60 years

Table 1: Characteristics of study participants (N= 60)

Variable	F	Percentage
Age		
20-40	13	21.67
40-60	21	35
60-80	25	41.67
81 & above	01	1.66
Sex		
Male	48	80
Female	12	20
Diet		
Vegetarian	46	76
Egg vegetarian	1	2
Mixed	13	22

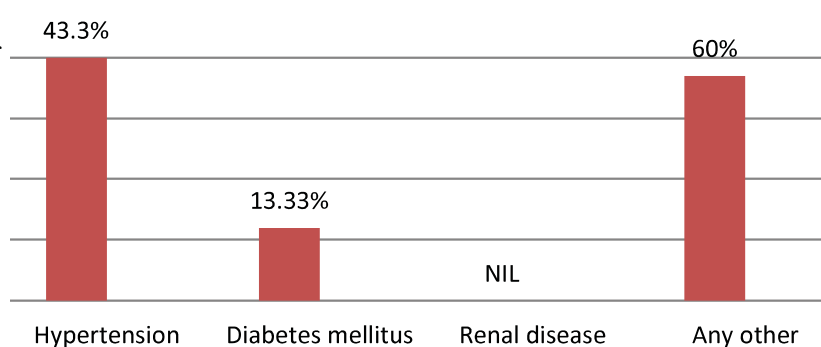


Figure 1: Concomitant disease.

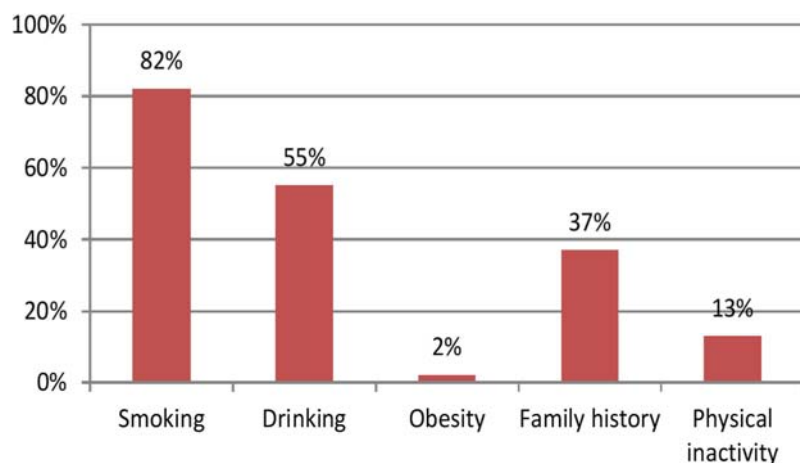


Figure 2: Risk factors.

of age group and 21.67 percent in the age group of 20-40, only 1.66 percent samples were from above 80 years age group. 80 percent samples were male, 20 percent were female. 76 percent samples were vegetarian. (Table 1).

Also, 43.33 percent sample had previous history of hypertension, 13.33 percent had history of diabetes mellitus, while only 10 percent had no history of previous disease (Fig 1); 81.67 percent of samples had habit of smoking, 55 percent were indulge in drinking, 1.67 percent had family history of obesity, and 36.7 percent had family history of heart disease, while 13.33 percent were inactive (Fig 2).

Forty percent samples had pain on retrosternal site, 20 percent on left side of chest, 8.33 percent on right side of chest, while 31.67 percent samples felt pain other than these sites. (In other sites 25 percent having pain in whole chest, 35 percent pain starts from arms, in 5 percent primary pain location site is lower limbs, in 10 percent epigastric region was the origin point, 15 percent had pain starting from shoulder, while only 5 percent had pain originating from jaw and back) (Fig 3).

Heaviness in chest was reported by 46.67 percent samples, 30 percent had choking sensation, 20 percent felt burning pain, 5 percent couldn't define their pain due to severity, while 28.33 percent had pain other than these categories. (In any other 52.94

percent felt throbbing pain, 23.52 percent had dull pain, 5.88 percent had deep pain in chest, 17.64 had stiffness of body, 5.88% had numbness in pain area) (Fig 4). 77 percent samples had pain severity >7 (on a 0-10 pain scale) 13 percent had pain of 3-5, 7 percent had pain in between 5-7, while only 3 percent samples had pain of 1-3 on pain scale (Fig 7).

41.67 percent sample's pain radiate to left arm, 20 percent on right arm, 25 percent pain radiate to neck, and 23.33 percent radiate to shoulder, while 20 percent samples had no radiation of pain, 53.33 percent had pain radiation other than these sites. (In other than these sites- 44 percent radiates to whole chest, 23.5 percent pain radiates to back and the same

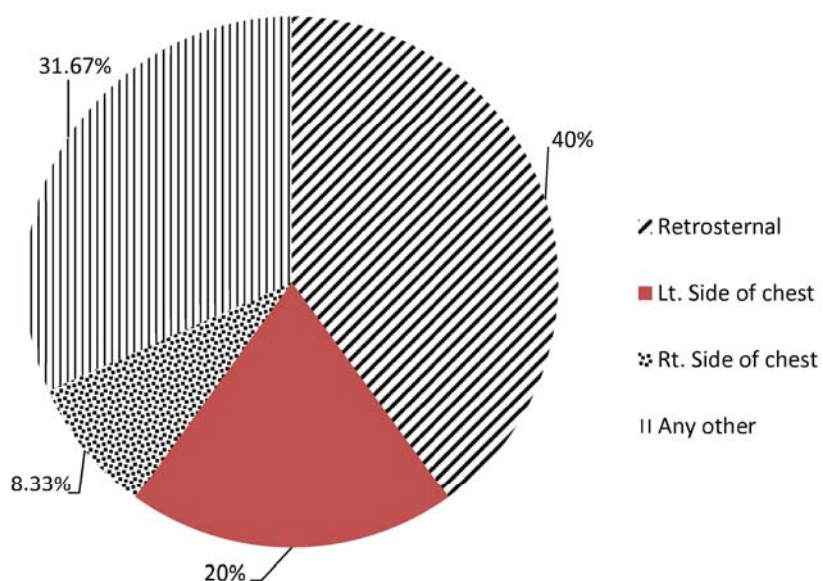


Figure 3: Location of pain.

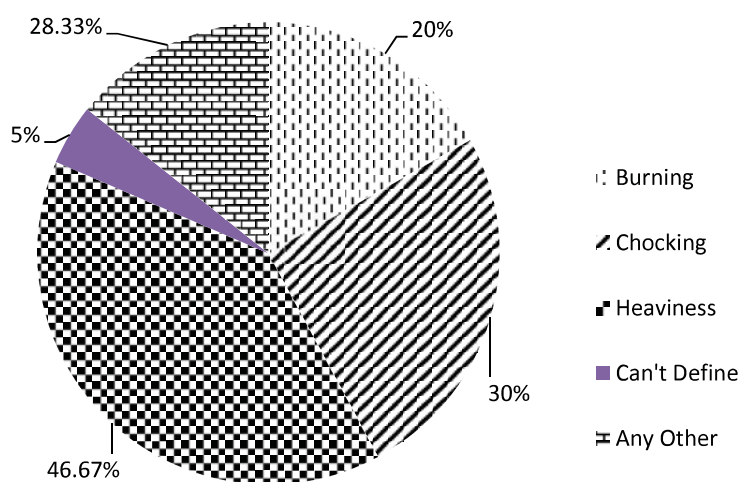


Figure 4: Quality of pain.

proportion radiates to jaw line, 3 percent pain radiates to scapula, and the same proportion had pain radiation to legs, 3 percent pain radiates to multiple

Table 2: Mean and SD of variables.

Test	Mean	SD
Height (metre)	1.62	0.0767
Weight (kg)	64	10.543
BMI (kg/m2)	24.094	3.53
Waist circumferences. (in inches)	36.95	3.90
Hip circumferences. (in inches)	39.36	3.37
Waist & hip ratio	0.933	1.048

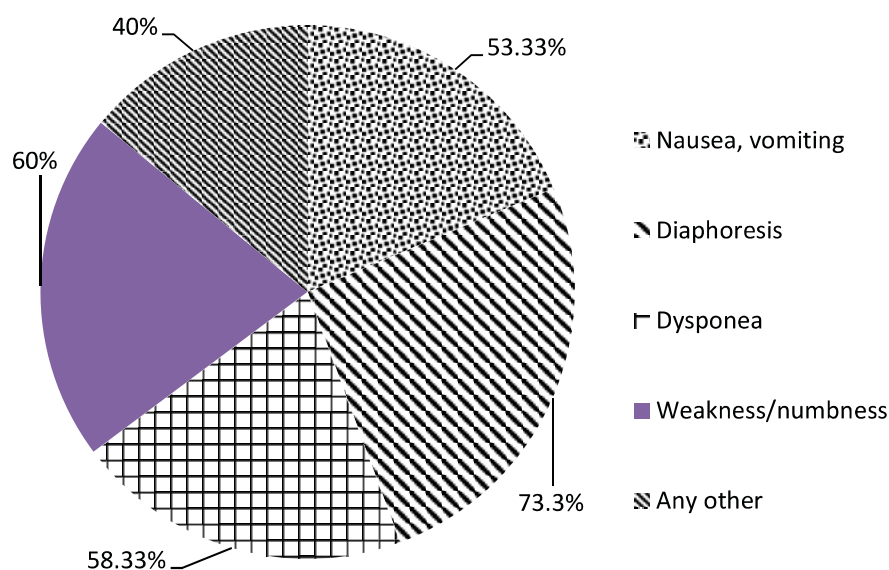


Figure 5: Associated sign & symptoms.

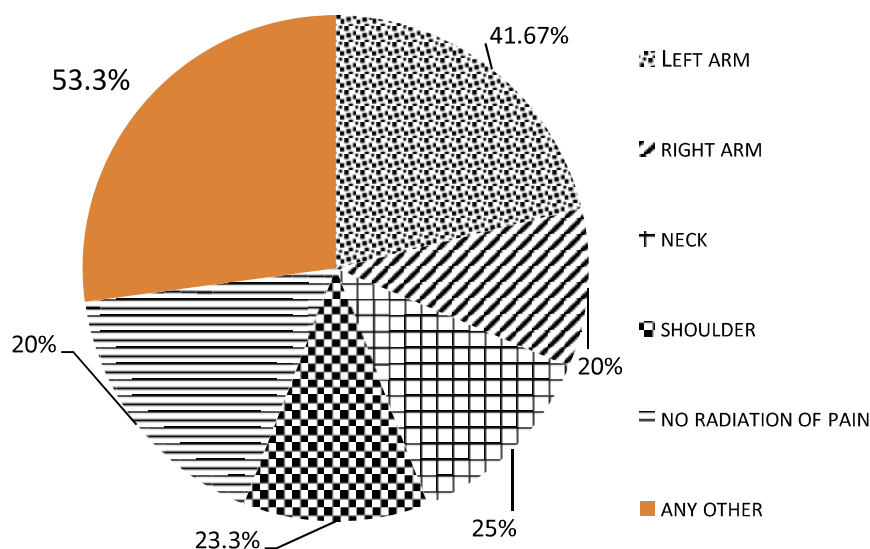


Figure 6: Radiation of pain.

regions (Fig 6).

73.33 percent samples had diaphoresis during pain, 58.33 percent had dyspnea, 53.33 percent felt nausea and vomiting, 60 percent had weakness/fatigue/numbness, while 40 percent samples had sign and symptoms other than these. In other sign and symptoms 33.33 percent samples had uneasiness during pain, and 6.66 percent had palpitation.

(Data depicted in Figures 4, 5, 6 has multiple response answer, so their percentage was calculated accordingly, in order to prevent misinterpretation of results.

Significant association was found with sex of patient and timing required for hospitalisation at 0.05 level of significant. (Female are admitted late in hospital) and in between waist and hip ratio with age of patient at 0.05 level of significant (chi square at 0.05 level of significance).

Discussion

The present study was conducted to identify the characteristics of chest pain and other symptoms experienced by coronary artery disease patients.

In this study, 40 percent samples had pain on retrosternal site, 20 percent on left side of chest, 8.33 percent on right side of chest, while 31.67 percent samples felt pain other than these sites. (In other sites 25% having pain in whole chest, 35% pain starts from arms, in 5% primary pain location site is lower limbs, in 10% epigastric region was the origin point, 15% had pain started from shoulder, while only 5% had pain originated from jaw and back).

Distinguishing whether a patient presenting with chest pain has ACS or a non-ACS problem is at best difficult. The differential diagnosis of chest pain is broad and includes many systems (Davies et al, 1985; Kreiner et al 2007; spalding et al, 2003), for example pulmonary embolism, tension pneumothorax, and aortic dissection.

Previous studies have found that between 2 percent and 8 percent of patients with acute myocardial infarction who present to the emergency department are sent home (McCarthy et al, 1993). The

rate of discharge of such patients represents at least 11,000 missed diagnoses of myocardial infarction per year.

SH Danesh-Sani, SA Danesh-Sani, R Zia, S Faghihi, 2012 conducted a study on Incidence of craniofacial pain of cardiac origin and suggested that 34.2 percent of patients during a cardiac ischaemic episode and 48 percent of patients during AMI experienced craniofacial pain. Craniofacial pain can be expected in 1.5 percent of patients as the sole symptom of AMI.

Pope et al (2000) conducted a study on missed diagnoses of acute myocardial infarction in the emergency department and found that among the 889 patients with acute myocardial infarction, 19 (2.1%) were mistakenly discharged from the emergency department (95% confidence interval, 1.1 to 3.1%); among the 966 patients with unstable angina, 22 (2.3%) were mistakenly discharged (95% confidence interval, 1.3 to 3.2%).

Implication of the Study

Nursing education: The findings of the study can be used in nursing education to make Nurse's more aware about the presenting sign and symptoms of heart disease. Importance of history taking can be taught.

Nursing research: We need to have regular survey or studies to identify different characteristics of chest pain of cardiac and non-cardiac reason, so as to educate public on early hospitalisation for better prognosis.

Nursing practice: Nurses used to work in multi-level health settings, they have to come in contact with population of different levels, where sometime she needs to take independent and prompt action. So, it's necessary for the nurses to be well equipped with knowledge of identification of heart disease and differentiating it with non-cardiac symptoms.

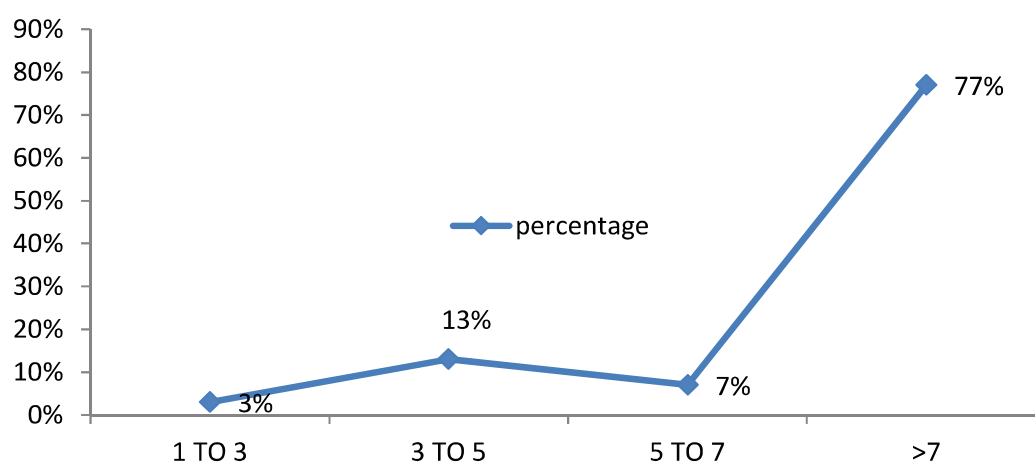


Figure 7: Showing severity of pain (Rating pain scale).

Recommendations

1. A similar study can be conducted on different settings with increasing number of sample size.
2. A similar study can be done with co-relation approach to find out characteristics difference with different sample groups.

Conclusion

Although cardiac chest pain is more common in retrosternal and left side of chest but it can manifest itself anywhere in upper chest and abdomen. Pain can radiate to atypical site or can remain localised to starting point. The failure to hospitalise patients with acute myocardial infarction or unstable angina who present to the emergency department is a serious public health issue. Therefore, it is concluded that pain referral to the atypical site along with typical sites of cardiac pain should be considered by practitioners to avoid misdiagnosis. An educational pamphlet can be provided to patients in order to increase their awareness.

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