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Emergency Department Evaluation of Patients with Chest Pain

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Abstract

Background: To note causes of chest pain in patients presenting to Medical Emergency of DHQ Teaching Hospital, Rawalpindi.

Methods: This descriptive study was conducted at Emergency Department of DHQ Teaching Hospital, Rawalpindi over 6 months. 500 patients presenting with chest pain were inducted consecutively. Diagnosis of ischemic and non-ischemic chest pain was based on clinical evaluation, electrocardiogram, and/or relevant investigations. Every patient was managed according to diagnosis. We collected and analyzed data regarding age, gender, diagnosis, and outcome of each subject.

Results: Of the 500 patients, 51.6% were male and 48.4% female. Mean patient age was 39.86 ± 14.93 years. Non-ischemic and ischemic chest pain was diagnosed in 88.4% [n=442] and 10.4% [n=52] patients respectively. 1.2% [n=6] patients left before a specific diagnosis was made. Musculo-skeletal chest pain was commonest diagnosis in 32.2% of all and 36.4% patients with non-ischemic chest pain. Hypertension, diabetes mellitus, and past history of ischemic heart disease were significantly associated with ischemic chest pain, (p value < 0.05).

Conclusion: Non-ischemic chest pain, specifically musculo-skeletal is commonest diagnosis made in chest pain patients attending medical emergency. Clues to diagnosis of ischemic chest pain in these patients are presence of hypertension, diabetes and past history of ischemic heart disease.

Introduction

Chest pain is one of the commonest symptoms encountered in clinical practice. During their lifetime, up to 25% of the general population experience chest pain in some form.[1] In USA six to eight million patients come to emergency departments with chest pain each year.[2] Patients with acute central chest pain account for 20 to 30% of emergency medical admissions.[3, 4] A number of diseases related to cardiovascular, gastrointestinal, pulmonary, and musculo-skeletal system can cause chest pain.[4, 5] Acute or severe chest pain should always be taken seriously as it may be caused by several potentially life threatening causes i.e., myocardial ischemia or infarction, aortic dissection, pulmonary embolism and pneumothorax that require urgent medical attention.

Decisions have to be quick and accurate as even in advanced countries, diagnosis of acute myocardial infarction can be missed in 2-5% patients.[6, 7] Up to 56.6% of Pakistani chest pain patients with normal ECG may have abnormalities on exercise tolerance test.[8] Current incidence of acute myocardial infarction in Pakistan is considered to be about 0.1 million. This figure is much higher than 1940's when 7 cases of heart attack were documented in a 5-year period [1944 to 1948] at Mayo Hospital, Lahore.[9] It is generally considered that majority of chest pain patients do not have serious illness like myocardial infarction. However the same has not been documented in Pakistan. This study was done to note causes of chest pain in patients presenting to medical emergency of DHQ Teaching Hospital, Rawalpindi.

Material and Methods

This descriptive study was conducted at Emergency Department of DHQ Teaching Hospital, Rawalpindi from 1st January to 30th June 2003. All patients presenting/referred to Medical Unit with acute chest pain [precordial/retrosternal/left sided] were included consecutively regardless of age and gender. Each patient was evaluated on basis of history and clinical examination with focus on characteristics of pain, duration of symptoms, vital signs and cardiovascular status. ECG was done in all subjects. Depending on clinical scenario, other investigations like chest X-ray, cardiac enzymes, blood CP, metabolic profile were also sought.

Diagnosis of ischemic heart disease and arrhythmia were made in standard way. Diagnoses of acid peptic disease, musculo-skeletal chest pain,

pneumonia, asthma etc were based on clinical evaluation and/or relevant investigations. Every patient was managed according to diagnosis and was admitted or discharged accordingly.

Data was collected regarding age, gender, diagnosis, and outcome of each patient. Patients with acute myocardial infarction, sub-endocardial infarction, unstable angina, or angina were categorized as suffering from ischemic chest pain [Group I], and the rest with other causes such as musculo-skeletal chest pain, dyspepsia, respiratory tract infection etc were labelled to be suffering from non-ischemic chest pain [Group II] Obtained data was converted into variables which were subsequently analyzed using statistical program SPSS version 10. Chi square test was used for p-value calculation.

Results

In six months, 4543 patients attended medical emergency. 11% [n=500] of these presented with chest pain. Of these 51.6% [n=258] were male and 48.4% [n=242] female. Mean patient age was 39.86 ± 14.93 years. Ischemic chest pain [Group I] was diagnosed in 10.4% [n=52] and non-ischemic chest pain [Group II] in 88.4% [n=442] patients. 1.2% [n=6] patients left before a specific diagnosis was made. Acute myocardial infarction was the commonest diagnosis made in Group I, and musculo-skeletal pain in Group II patients (Table 1 and 2).

Table 1: Diagnosis made in Group I Patients

Diagnosis	No and [%]
Acute myocardial infarction	24 [46.1]
Angina/unstable angina/SEE*	16 [30.7]
Hypertension and angina	12 [23]
Total	52 [100]

** SEE- sub-endocardial infarction.*

Group I included 61.5% [n=32] males and 38.4% [n=20] females, while Group II comprised 50.4% [n=223] males and 49.6% [n=219] females. 11.37% [29 out of 255] male and 8.36% [20 out of 239] female patients had ischemic chest pain (p value 0.17). Mean age of Group I and II patients was 50.5 ± 11.9 and 38.7 ± 14.6 years respectively. 26.9% [n=14] and 14% [n=62] of Group I and II patients were hypertensive (p value 0.025). 9.6% [n=5] and 1.4% [n=6] of Group I and II patients were diabetic (p value 0.0030). Past history of ischemic heart disease was noted in only Group I patients i.e., 9.6% [n=5] (p value 0.00001). 59.6% [n=31] Group I patients were admitted, 36.5% [n=19] discharged, while 3.8% [n=2] left against medical advice. 2.26% [n=10] of Group II patients

Table 2: Diagnosis in Group II Patients

Diagnosis	No and [%]	Diagnosis	No and [%]
Musculo-skeletal pain	161 [36.4]	Breast abscess	3 [.67]
Dyspepsia	79 [17.8]	Pericarditis	2 [.45]
Asthma	72 [16.28]	COPD**	2 [.45]
Respiratory tract infection	35 [7.9]	Diabetic ketoacidosis	2 [.45]
Hypertension	30 [6.78]	Pulmonary tuberculosis	1 [.22]
Psychiatric disorder*	38 [7.6]	Acute cholecystitis	1 [.22]
Congestive cardiac failure	5 [1.13	Allergic reaction	1 [.22]
Supraventricular tachycardia	5 [1.13]	Trauma	1 [.22]
Anemia	3 [.67]	Mitral stenosis	1 [.22]

** Psychiatric disorder- Anxiety/depression/panic episodes etc.* *** COPD- Chronic obstructive pulmonary disease.*

were admitted, 95.4% [n=422] discharged, 1.58% [n=7] referred to other departments, and 0.67% [n=3] left against medical advice.

Discussion

Generally 20-30% of patients attending emergency departments have chest pain.[3, 4] Only 11 to 34% of the ambulatory population presenting with chest pain have cardiac cause.[10] According to an estimate acute myocardial infarction and unstable angina are observed in 15% and 30-35% of chest pain patients presenting to emergency department.[2, 11] In a recent study by Davie et al, 18% of patients referred with new or increasing chest pain had acute coronary syndrome requiring admission.[12] 30% patients with stable ischemic heart disease were discharged in the same study. Similar results were obtained in related studies by Harefield, Hillingdon & Southampton.[13-15] Our results are comparable; 89.2% of total and 36.4% ischemic chest pain patients were discharged.

Assessment of acute chest pain requires more than ruling out acute coronary syndromes. Non-ischemic chest pain is remarkably common in general population.[16] and the differential diagnosis includes gastrointestinal disorders [peptic ulcer and esophagitis], musculo-skeletal disorders, pneumonia, pneumothorax, and anxiety.[17] Epidemiological information regarding non-ischemic chest pain in general population is scarce and variable.[16] In a community-based study, prevalence of non-ischemic chest pain was 23%.[18] According to another estimate, about two thirds of emergency admissions with chest pain have non cardiac cause for their pain.[3] Our results are comparable; 88.4% of our patients had non-ischemic chest pain.

Musculo-skeletal chest pain was the commonest diagnosis made in our patients. This kind of pain is responsible for 10-69% of patients presenting with chest pain.[19, 20] Various musculo-skeletal disorders of chest wall and neck can be source of chest pain. Costochondritis, chest wall trauma, fibrositis, and myalgias are common causes.[21, 22] Pain arising from these structures can be mistaken for angina pectoris, pleurisy or other serious disorders.[21] Information about onset, location, character, duration and modulating factors of the pain and other symptoms, a meticulous examination of the ribs, spine, sternum and their articulations, and few judiciously selected diagnostic investigations establish the diagnosis in most of these patients.

Dyspepsia was another common cause of non-ischemic chest pain in our study. It is a common problem which can be caused by conditions like gastro-esophageal reflux disease [GERD], motility disorders, peptic ulcer disease, and malignancy.[23] Generally cardiac and esophageal pains have different patterns but in up to 20% cases it is difficult to pin point on clinical grounds.[24] Asthma, respiratory tract infection, and hypertension were frequently diagnosed in our patients with non-ischemic chest pain. These conditions are well recognized causes of chest pain.[5, 25] Psychiatric disorders were also common in our patients. It has been noted in various studies that 22 to 62% of patients with various psychogenic disorders initially present with chest pain.[26]

Mean age of our Group I patients corresponds with age in which ischemic heart disease is generally noted.[8, 27] Mean age of our Group II patients also matches with results of other related studies.[28] More males had ischemic chest pain in our study. This has already been documented in various Pakistani studies.[29-31] Previously, female predominance in patients with non-ischemic chest pain has been noted.[32] This is considered due to tendency of female patients with functional gastrointestinal disorders to seek medical attention more commonly than males.[33] In a more recent study however, somewhat different results were noted i.e., 23.9% of males and 22.4% of females had non-ischemic chest pain.[18] Almost equal number of males and females had non-ischemic chest pain in our study.

Hypertension, diabetes mellitus and previous history of ischemic heart disease were significantly associated with ischemic chest pain in our patients. Our findings correspond with observations made in various local studies that age >50 years, male gender, diabetes mellitus, and hypertension are commonest risk factors for development of ischemic cardiac chest pain in our population.[8, 34] No prior history of organic heart disease is generally noted in majority of patients with non-ischemic chest pain.[35] Same was noted by us. We did not diagnose conditions like aortic aneurysm and pulmonary embolism or infarction as cause of chest pain in any patient even after admission.

In conclusion, chest pain is a common presenting complaint of patients attending medical emergency. Critical to proper evaluation of these patients is identification of cardiac ischemic event, and admission of patients with acute coronary syndromes. Musculo-skeletal conditions are the most frequent cause. Ischemic cardiac chest pain is diagnosed in

10.4% of these patients. Age > 50 years, male gender, diabetes mellitus, and previous history of ischemic heart disease, when present, point towards ischemic heart disease in these patients.

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