



MANAGEMENT OF CARDIAC SYMPTOMS AT THE EMERGENCY DEPARTMENT OF A TERTIARY CARE HOSPITAL

Emergency Medicine

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ABSTRACT

Cardiac diseases are a major public health problem worldwide. Cardiovascular diseases (CVDs) have now become the leading cause of mortality in India. The CVD death rate of 272 per 100,000 population in India is higher than the global average of 235 per 100,000 population.[1]. Approximately 70% of patients presenting with chest pain to the emergency department have an undiagnosed chest pain, the incidence of cardiovascular events in such patients is significantly high.[2] A hospital based prospective observational study, was conducted at a tertiary care hospital for 6 months. It included patients over 18 years of age presenting to the ED with symptoms related to cardiac diseases. Patients visiting the emergency room with complaints related to cardiac diseases were identified. Patients who met with inclusion criteria were recruited after obtaining informed consent and data was collected with the help of a data collection form. During the study period, 6700 patients visited the emergency department (ED), of which 775 had the cardiac symptoms. Acute chest pain was the most common presenting complaint (4.78% of ED visits). 46.58% were male and 53.42% female, with cardiac symptoms most prevalent in the age group of 41–45 years (18.06%). Acute Chest pain and Dyspnoea were the primary symptoms. ECG was performed in 89.6% of patients with chest pain and 61.2% with dyspnoea. PPIs (34.84%) and bronchodilators (29.03%) were the most frequently prescribed medications. Among those with chest pain, 53.05% received PPIs and 34.76% analgesics, while dyspnoeic patients were commonly treated with bronchodilators and diuretics (19.2%). Acute chest pain was the most common presentation among enrolled emergency department patients exhibiting potential cardiac etiologies. Proton pump inhibitors (PPIs) and bronchodilators were the most frequently prescribed drugs. ECG monitoring was high, particularly in patients with suspected cardiac symptoms with coronary artery disease being the predominant cardiac diagnosis.

KEYWORDS

Cardiovascular Diseases, Emergency Department, Chest Pain, Dyspnoea, ECG, PPIs

INTRODUCTION

Cardiac diseases are a significant global public health concern, encompassing a wide range of conditions such as arrhythmias, coronary artery disease (including stable angina, unstable angina, STEMI, and NSTEMI), myocardial disorders like hypertrophic and dilated cardiomyopathy, heart failure, valvular heart disease, cor pulmonale (right-sided heart failure), and congenital heart defects. Clinical presentations vary but commonly include chest pain or discomfort radiating to the shoulder, arm, back, or jaw; dyspnoea; fatigue; orthopnoea; paroxysmal nocturnal dyspnoea; tachypnoea; cough; diaphoresis; palpitations; dizziness; syncope; hypotension; pulmonary congestion; peripheral oedema; nausea; vomiting; anxiety; altered mental status; and weight gain.

Types of Cardiac Disease:

1. Coronary Artery Disease (CAD), also known as IHD
2. Heart failure (HF)
3. Arrhythmias
4. Cardiomyopathy
5. Congenital heart disease

Epidemiology

Cardiovascular diseases are now the leading cause of mortality in India, accounting for 31% of global deaths as per World Health Organization estimates in 2015, with ischemic heart disease (IHD) and stroke responsible for over 80% of CVD-related deaths^{[3][4]}. Acute chest pain is a frequent complaint in emergency departments (ED), comprising 5.2% of visits in the USA and 6% in England and Wales^[5]. Notably, around 70% of chest pain cases in the ED remain undiagnosed, yet carry a high risk of cardiovascular events^[6]. Heart failure affects about 2% of adults in developed countries and 9% of those aged 80–89, being the most common cause of mortality among elderly ED patients^[7].

Nonpharmacological Treatment

For STEMI patients presenting within 12 hours of symptom onset, primary PCI of the infarct artery should be performed within 90

minutes of first medical contact. In NSTEMI-ACS, doctors recommend coronary angiography followed by PCI or CABG.

Pharmacological Treatment

Anticoagulants, such as Heparin, Warfarin, and LMWH, reduce blood clotting. Antiplatelet medications like Aspirin and Clopidogrel prevent platelets from clumping together. Diuretics, such as Furosemide and Hydrochlorothiazide, increase urine output. ACE inhibitors, like Enalapril and Lisinopril, prevent the conversion of Angiotensin I to II. ARBs, including Losartan and Telmisartan, block angiotensin receptors and impact the renin-angiotensin system. Beta-blockers, such as Propranolol and Metoprolol, block β -adrenergic receptors. Anti-arrhythmic drugs help stabilize heart rhythm in various ways: Class one includes sodium channel blockers, Class two consists of β -blockers, Class three involves AP prolongers like Amiodarone, and Class four includes calcium channel blockers like Verapamil.

Methodology

It was a prospective, hospital based observational study, conducted at tertiary care hospital for 6 months. Ethical committee clearance was obtained from the Institutional Review Board (IRB) of the tertiary care hospital. Patients visiting the emergency room with complaints related to cardiac diseases were identified by students posted in the emergency ward on a daily basis. An informed consent was obtained from the patients who were willing to participate in the study. Patients of both the gender above 18 years who came to ED with presenting symptoms related to cardiac diseases such as acute chest pain, dyspnea, giddiness etc were included. Patient presenting with chest pain or dyspnea caused by trauma or poisoning, persisting or recurrent chest pain caused by rheumatic diseases or cancer, patient presenting to the ED again within 30 days after the initial enrolment. And patients not willing to participate in the study were excluded. Data such as the patient's demographics, risk factors, ED presentation, initial evaluation, daily vitals, further diagnostic testing, pharmacotherapy and outcomes were collected with the help of a data collection form.

RESULTS

Out of the 6700 patients received at the emergency department, 775

patients presented with cardiac symptoms (11.56%) whereas 5925 patients had non-cardiac symptoms (88.44%).

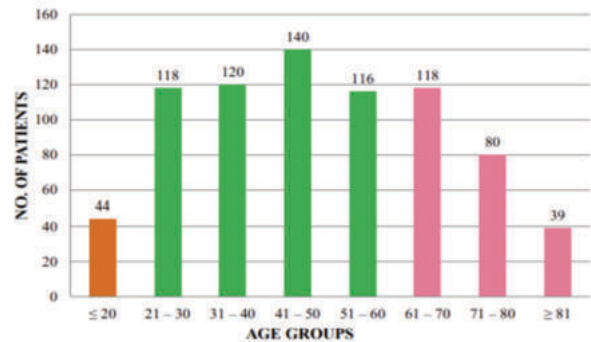


Figure 01: Distribution of ED Patients Based On Various Age Groups

When checking on the basis of age groups, the highest number of patients belonged to the 41–50 years range (140 patients, 18.1%), followed very closely by the 31–40 (120 patients, 15.5%), the 21–30 as well as 61–70 (each had 118 patients, 15.2%), and 51–60 (116 patients, 15%) age groups. Fewer patients visited the emergency department in the groups under 20 years old (44 patients, 5.7%) and those aged 81 and over (39 patients, 5%). The 71 to 80 age group had 80 patients (10.3%). Overall, the data shows that middle-aged adults (31 to 70 years) made up for most emergency department visits for cardiac issues. This indicated a higher number of acute cardiac symptoms in patients of this age group.

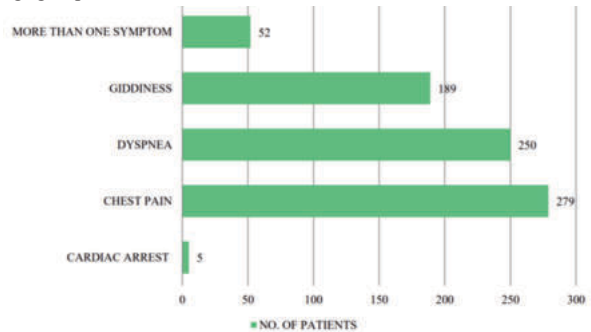


Figure 02: Distribution of Emergency Department (ED) Patients Based on Various Chief Cardiac Complaints

Among the 775 patients enrolled in the study, the most commonly reported symptom was chest pain, affecting 279 patients (35.9%). This was followed by dyspnea in 250 patients (32.3%) and giddiness in 189 patients (24.4%). 52 patients (6.7%) of patients reported more than one symptom. Cardiac arrest was the least common complaint, with only 5 patients (0.6%). This distribution shows that chest pain and dyspnea are the main symptoms seen in cardiac-related emergency department visits.

Table 03: Distribution of ED Patients Based On Hospital Admissions

HOSPITAL ADMISSION	NO. OF PATIENTS	PERCENTAGE
CARDIAC CARE UNIT	017	02.19
GENERAL WARDS	056	07.22
INTENSIVE CARE UNIT	087	11.23
LEAVE AGAINST MEDICAL ADVISE (LAMA)	143	18.45
NO ADMISSION	460	59.36
TRANSFER OUT	012	01.55
TOTAL	775	100.0

The majority, 59.36% (460 patients) of the 775 , were not admitted to the hospital, indicating either mild conditions or other non-admission criteria. Among those admitted, the highest proportion was in the Leave Against Medical Advice (LAMA) category, comprising 18.45% (143 patients), showing patients chose to discontinue treatment. Admissions to the Intensive Care Unit (ICU) and General Wards made up 11.23% (87 patients) and 7.22% (56 patients) respectively. A small

number of patients were admitted to the Cardiac Care Unit (2.19%) and transferred out (1.55%). This suggests either stabilization or referral to other facilities. This distribution shows a need to further evaluate non-admission reasons and LAMA cases, which together account for over 77% of total cases. This indicates possible gaps in awareness.

Table 04: Management Strategies Used For Patients Presenting With Chest Pain at the Emergency Department

TREATMENT AND PROCEDURES	NO. OF PATIENTS (N=279)	PERCENTAGE
DIAGNOSTIC PROCEDURES		
CHEST X RAY	011	03.94
ELECTROCARDIOGRAM (ECG)	250	89.60
RANDOM BLOOD SUGARS (RBS)	217	77.78
TROPONIN I	043	15.41
PHARMACOLOGICAL TREATMENT		
ANALGESICS	097	34.76
DICLOFENAC	009	03.22
PARACETAMOL	065	23.30
TRAMADOL	023	08.24
ANTICOAGULANTS	014	05.01
ENOXAPARIN	011	03.94
HEPARIN	003	01.08
ANTIPLATELETS	078	27.96
SINGLE ANTIPLATELET* (SAPT)	003	01.07
DUAL ANTIPLATELETS* (DAPT)	059	21.15
TRIPLE ANTIPLATELETS* (TAPT)	016	05.74
BRONCHODILATORS	014	05.01
BUDESONIDE + LEVOSALBUTAMOL	014	05.01
PROTON PUMP INHIBITORS	148	53.05
PANTOPRAZOLE	148	53.05

Among diagnostic procedures, the electrocardiogram (ECG) was the most commonly performed test, conducted in 89.60% of cases. Random blood sugar (RBS) testing at 77.78%. Troponin I testing was done in (15.41%) of cases. Chest X-ray was performed in just 3.94% of cases. For pharmacological treatment, the most commonly given drug was pantoprazole, a proton pump inhibitor (PPI), administered to 148 patients (53.05%). Analgesics were used for 97 patients, (34.76%), mostly paracetamol at (23.30%), followed by tramadol at (8.24%) and diclofenac at (3.22%). Antiplatelet therapy was given to 78 patients (27.96%), with dual antiplatelet therapy (DAPT) being the most common at (21.15%). Anticoagulants and bronchodilators were each provided to 14 patients (5.01%).

DISCUSSION

A six-month prospective observational study titled “Management of Cardiac Symptoms at the Emergency Department of a Tertiary Care Hospital” enrolled 775 patients (11.56%) out of 6,700 ED visits. The majority were aged 41–45 years, with a mean age of 49.25 years; 53.42% were female. The most common presenting symptoms were chest pain (36%), dyspnoea (32.26%), and dizziness (24.39%), with most patients triaged as CTAS level 3 (urgent). ECG (80.25%) and RBS (66.32%) were the most frequently performed diagnostic tests, while PPIs (34.84%), bronchodilators (29.03%), and antiemetics (20.9%) were the most commonly prescribed drugs. Among symptom-specific groups, ECG and RBS were predominantly used for chest pain and dyspnoea, while dizziness cases mainly underwent RBS testing. Treatment varied, with two-thirds of patients receiving multiple drugs.

Overall, 59.36% of patients were discharged, 20.64% hospitalized, and 18.45% left against medical advice. Among hospitalized patients, 54.4% were admitted to ICU and 10.62% to CCU, with dyspnoea leading ICU admissions and chest pain dominant in CCU cases. Cardiac diagnoses accounted for 28.1% of admissions, mainly in males, while females had more non-cardiac causes like respiratory infections, diabetes, and anaemia. Among cardiac inpatients, 66.67% had CAD (split between STEMI and NSTEMI) and 33.33% had cardiomyopathy. Major risk factors included hypertension (73.3%), diabetes (53.3%), and age >60 years (51.1%). ECG and 2D echo were performed in over 90% of cardiac cases, and treatment predominantly included antiplatelets, anticoagulants, statins, and antihypertensives, with an average hospital stay of six days.

CONCLUSION

Over six months, the study enrolled patients presenting predominantly with chest pain, dyspnoea, and dizziness, most of whom were elderly. Common investigations included ECG and random blood sugar, while

a significant proportion received no treatment. Proton pump inhibitors, bronchodilators, and antiemetics were the most frequently prescribed drugs, often in combination. Chest pain cases were mostly evaluated with ECG and managed with PPIs and antiplatelets, while dyspnoea was commonly treated with bronchodilators. Dizziness was typically assessed with blood sugar testing and managed with antivertigo and antiemetic agents. The majority of patients were discharged, but critically ill elderly patients were more likely to be admitted, many requiring ICU care, with coronary artery disease being a frequent diagnosis among cardiac cases.

REFERENCES

1. Prabhakaran D, Jeemon P, Roy A. Cardiovascular Diseases in India: Current Epidemiology and Future Directions. *Circulation*. [Internet]. 2016 [cited 2016 Apr 19];133(16):1605-20. Available at: <https://pubmed.ncbi.nlm.nih.gov/27142605/>.
2. Jordan KP, Timmis A, Croft P, van der Windt DA et al. Prognosis of undiagnosed chest pain: linked electronic health record cohort study. *BMJ*. [Internet]. 2017 [cited 2017 Apr 3];3:357:1194. Available at: <https://pmc.ncbi.nlm.nih.gov/articles/PMC5482346/>.
3. Mishra R, Monica. Determinants of cardiovascular disease and sequential decision-making for treatment among women: A Heckman's approach. *SSM Popul Health*. [Internet]. 2019 [cited 2019 Jan 23] ;7:100365. Available at: <https://pmc.ncbi.nlm.nih.gov/articles/PMC6360511/>.
4. Zheng W, Wang J, Xu F et al. Evaluation and management of patients with acute chest pain in China (EMPACT): protocol for a prospective, multicentre registry study. *BMJ Open*. [Internet]. 2018 [cited 2018 Jan 23] ;8(1):017872. Available at: <https://pubmed.ncbi.nlm.nih.gov/29362251/>.
5. Kuo DC, Peacock WF. Diagnosing and managing acute heart failure in the emergency department. *Clin Exp Emerg Med*. [Internet]. 2015 [cited 2015 Sep 30] ;2(3):141-149. Available at: <https://pmc.ncbi.nlm.nih.gov/articles/PMC5052845/>.
6. Kumar A, Cannon CP. Acute coronary syndromes: diagnosis and management, part I. *Mayo Clin Proc*. [Internet]. 2009 [cited 2009 Oct] ;84(10):917-38. Available at: <https://pmc.ncbi.nlm.nih.gov/articles/PMC2755812/>.
7. Wells BG, DiPiro JT, Schwinghammer TL, DiPiro CV. *Pharmacotherapy Handbook*. 10th ed. New York: McGraw Hill; 2017.