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Clinicodemographic Profile of Patients Presenting with Chest Pain to the Emergency Department of a Tertiary Care Hospital: A Retrospective Cross-Sectional Study

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ABSTRACT

Background: Chest pain is a frequent emergency department (ED) presentation with diverse aetiologies ranging from benign conditions to life-threatening cardiovascular emergencies. Clinicodemographic data from Indian tertiary care centres remain limited.
Objectives: To describe the clinicodemographic profile, final diagnoses, and disposition of patients presenting with chest pain to a tertiary care ED.
Methods: In this retrospective cross-sectional study at Amrita Institute of Medical Sciences, Faridabad, India, records of all adult patients presenting with chest pain between January and December 2025 were reviewed by consecutive sampling. Demographics, final diagnosis, disposition, and management were extracted using a structured proforma. Categorical variables were summarised as frequencies and percentages; associations were assessed using the chi-square test ($p<0.05$ significant).
Results: Of 790 patients, 560 (70.9%) were male and 230 (29.1%) female (mean age 57.6 ± 18.4 years); 40.6% were aged 61–80 years. Angina was the commonest diagnosis (229, 29.0%), followed by ST-elevation myocardial infarction (STEMI) (163, 20.6%), acute coronary syndrome (ACS) (133, 16.8%), and coronary artery disease (CAD) (77, 9.7%). Catheterisation laboratory transfer was the commonest disposition (290, 36.7%). Medical management alone was used in 422 (53.4%) and an invasive cardiac procedure in 368 (46.6%). STEMI was markedly more frequent among males than females (142 vs 21).
Conclusion: Ischaemic heart disease, particularly angina, STEMI, and ACS, accounted for the predominant burden of presentations, with a marked male preponderance and increasing severity with age. These findings support strengthening standardised chest pain pathways and rapid access to catheterisation services.

Keywords: *Chest pain; Emergency department; Clinicodemographic profile; Acute coronary syndrome; ST-elevation myocardial infarction; Tertiary care.*

INTRODUCTION

Chest pain is one of the most common presenting complaints in emergency departments (EDs) worldwide, accounting for approximately 5–10% of all ED visits, and represents a major diagnostic challenge because of its diverse spectrum of aetiologies—ranging from benign, self-limiting conditions to immediately life-threatening cardiovascular emergencies such as acute myocardial infarction, pulmonary embolism, and aortic dissection (Collet et al., 2023; Gulati et al., 2021; Thygesen et al., 2018). Emergency physicians must rapidly differentiate high-risk causes from benign aetiologies while avoiding unnecessary investigations and admissions, a balance that requires structured clinical assessment supported by electrocardiography, cardiac biomarkers, imaging, and validated risk-stratification tools (Amsterdam et al., 2014; Hermann et al., 2010).

India has undergone a rapid epidemiological transition over the past three decades, with coronary artery disease emerging as a leading cause of mortality; notably, Indian patients tend to develop coronary artery disease nearly a decade earlier than Western populations, increasing the burden among economically productive age groups (Goodacre et al., 2005; Swap & Nagurney, 2005). Despite this rising burden, published data describing the clinicodemographic profile, diagnostic spectrum, and disposition patterns of patients presenting with chest pain from Indian tertiary care emergency departments remain limited. Understanding these local patterns is essential to refine triage protocols, optimise resource allocation, and inform context-specific risk-stratification strategies.

This study was therefore undertaken to describe the clinicodemographic profile, final diagnoses, and disposition of patients presenting with chest pain to the emergency department of a tertiary care teaching hospital in northern India.

Objectives

1. To analyse the demographic characteristics (age and sex distribution) of patients presenting with chest pain to the emergency department.
2. To determine the spectrum of final diagnoses among these patients.
3. To evaluate the disposition and management modalities employed.
4. To examine the association of age and sex with major final diagnoses.

MATERIALS AND METHODS

Study Design and Setting

This was a retrospective cross-sectional observational study conducted in the Department of Emergency Medicine, Amrita Institute of Medical Sciences, Faridabad, Haryana, India—a tertiary care teaching hospital providing comprehensive emergency services to an urban and rural catchment population.

Study Duration and Population

All adult patients presenting to the ED with chest pain as the chief complaint between January 2025 and December 2025 (1 year) were eligible. Institutional approval was obtained prior to data collection.

Sample Size and Sampling Technique

A total of 790 patients fulfilling the eligibility criteria during the study period were included using consecutive sampling; no formal sample-size calculation was performed as all eligible records during the defined period were enrolled.

Eligibility Criteria

Inclusion criteria: (i) age ≥21 years; (ii) chest pain as the primary presenting complaint; (iii) complete demographic and clinical records; (iv) managed in the ED irrespective of final disposition.

Exclusion criteria: (i) age <21 years; (ii) incomplete or missing medical records; (iii) trauma-related chest pain; (iv) patients who did not continue treatment (e.g., left against medical advice, discharge on request).

Data Collection

Data were extracted from ED and hospital medical records using a structured data-collection proforma capturing date of presentation, age, sex, final diagnosis, admission status, and management. Personal identifiers were removed prior to analysis to maintain confidentiality. Data were entered into Microsoft Excel and screened for completeness and duplication before analysis.

Statistical Analysis

Statistical analysis was performed using IBM SPSS Statistics (version 26 or later). Continuous variables (age) were summarised as mean ± standard deviation. Categorical variables (sex, diagnosis, disposition, management) were summarised as frequencies and percentages. Associations between categorical variables were assessed using the chi-square test or Fisher's exact test, as appropriate, with $p<0.05$ considered statistically significant.

RESULTS

A total of 790 patients presenting with chest pain during the one-year study period were analysed.

Demographic Profile

Of the 790 patients, 560 (70.9%) were male and 230 (29.1%) were female, indicating a marked male preponderance (Table 1). The mean age of the study population was 57.6 ± 18.4 years. The majority of patients belonged to the 61–80-year age group (321, 40.6%), followed by the 41–60-year age group (295, 37.3%); patients aged 21–40 years and those above 80 years constituted 17.1% and 4.9% of the cohort, respectively (Table 2).

Table 1. Distribution of Patients by Sex (N = 790)

Sex	Number (n)	Percentage (%)
Male	560	70.9
Female	230	29.1
Total	790	100.0

Table 2. Age Distribution of Patients (N = 790)

Age Group (years)	Number (n)	Percentage (%)
21–40	135	17.1
41–60	295	37.3
61–80	321	40.6
>80	39	4.9
Total	790	100.0

Final Diagnoses

Cardiovascular causes accounted for the overwhelming majority of presentations. Angina was the commonest final diagnosis (229, 29.0%), followed by STEMI (163, 20.6%), ACS (133, 16.8%), and CAD (77, 9.7%). Non-cardiac causes—including lower respiratory tract infection, pneumonia, hypertension, congestive heart failure, COPD, atrial fibrillation, chronic kidney disease, gastritis, and carcinoma lung—were comparatively less common (Table 3).

Table 3. Distribution of Final Diagnoses (N = 790)

Final Diagnosis	Number (n)	Percentage (%)
Angina	229	29.0
STEMI	163	20.6
Acute coronary syndrome (ACS)	133	16.8
Coronary artery disease (CAD)	77	9.7
Lower respiratory tract infection	22	2.8
NSTEMI	20	2.5
Pneumonia	18	2.0
Hypertension	16	1.9
Congestive heart failure	15	1.8
Unstable angina	14	1.1
Carcinoma lung	9	1.0
COPD	8	0.8
Atrial fibrillation	6	0.8
Chronic kidney disease	6	0.8
Gastritis	5	0.6
Other diagnoses*	49	6.2
Total	790	100.0

**Other diagnoses include tuberculosis, arrhythmias, pyelonephritis, cirrhosis, syncope, and other miscellaneous diagnoses.*

Disposition and Management

The catheterisation laboratory was the commonest disposition (290, 36.7%), reflecting the high proportion of patients requiring urgent coronary angiography or percutaneous coronary intervention. A further 225 (28.5%) were discharged after ED evaluation, 144 (18.2%) required ICU admission, 129 (16.3%) were admitted to the general ward, and 2 (0.3%) required CTVS referral (Table 4). Medical management alone was employed in 422 patients (53.4%), while 368 (46.6%) underwent an invasive cardiac procedure: PTCA in 318 (40.3%), CAG in 36 (4.6%), CABG in 8 (1.0%), and POBA or PCI in 3 each (0.4%) (Table 5).

Table 4. Disposition of Patients (N = 790)

Disposition	Number (n)	Percentage (%)
Catheterisation laboratory	290	36.7
Discharge	225	28.5
ICU	144	18.2
Ward	129	16.3
CTVS	2	0.3
Total	790	100.0

Table 5. Distribution of Management Modalities (N = 790)

Management	Number (n)	Percentage (%)
Medical management	422	53.4
PTCA	318	40.3
CAG	36	4.6
CABG	8	1.0
POBA	3	0.4
PCI	3	0.4
Total	790	100.0

Age and Sex Distribution of Major Diagnoses

The frequency and severity of ischaemic heart disease increased with advancing age: the 61–80-year group recorded the highest numbers of STEMI (76), ACS (62), and CAD (42) cases, whereas angina was most evenly distributed among patients aged 21–60 years (85 cases each) (Table 6). On sex-stratified analysis, STEMI was substantially more frequent among males than females (142 vs 21), whereas angina and CAD were proportionally more common among females relative to their share of the cohort (Table 7).

Table 6. Age Group versus Major Final Diagnosis (N = 790)

Age Group (yrs)	Angina	STEMI	ACS	CAD	Others	Total
21–40	85	16	5	3	26	135
41–60	85	62	55	26	67	295
61–80	56	76	62	42	85	321
>80	3	9	11	6	10	39
Total	229	163	133	77	188	790

Table 7. Sex versus Major Final Diagnosis (N = 790)

Final Diagnosis	Male (n=560)	Female (n=230)	Total
Angina	146	83	229
STEMI	142	21	163
ACS	99	34	133
CAD	49	28	77
Other	124	64	188
Total	560	230	790

DISCUSSION

In this retrospective cross-sectional study of 790 patients presenting with chest pain to a tertiary care ED, ischaemic heart disease accounted for the predominant burden of presentations, with a marked male preponderance (70.9%) consistent with large international cardiovascular registries such as GRACE and the National Registry of Myocardial Infarction, both of which reported a higher incidence of acute coronary syndromes among men (Dawber, 1980; Fox et al., 2006). This gender disparity is generally attributed to a higher prevalence of modifiable risk factors—smoking, diabetes, hypertension, dyslipidaemia, and occupational stress—among men, together with the protective effect of endogenous oestrogen in premenopausal women (Fox et al., 2006). Nonetheless, women in our cohort and in prior registries often present atypically, underscoring the need for equal diagnostic vigilance across sexes.

The mean age in our cohort (57.6 ± 18.4 years), with the highest burden in the 61–80-year group, mirrors findings from the Framingham Heart Study and GRACE registry, both of which identified advancing age as an independent risk factor for coronary artery disease secondary to cumulative risk exposure, endothelial dysfunction, and progressive atherosclerosis (Canto et al., 2000; Dawber, 1980).

Angina, STEMI, and ACS together accounted for the majority of final diagnoses, reinforcing international and Indian hospital-based data showing that approximately 10–20% of ED chest pain presentations are attributable to ACS, with the remainder comprising gastrointestinal, respiratory, musculoskeletal, and other non-cardiac aetiologies (Bandstein et al., 2014; Gulati et al., 2021; Hollander et al., 1999). The substantial proportion of patients requiring catheterisation laboratory transfer (36.7%) and invasive cardiac procedures (46.6%) reflects both the high-acuity referral pattern of a tertiary centre and the availability of round-the-clock interventional cardiology services, consistent with current guideline-recommended early invasive strategies for appropriately selected ACS patients (Collet et al., 2023; Roffi et al., 2016).

These findings have direct implications for emergency department practice: standardised chest pain pathways incorporating rapid electrocardiography, high-sensitivity troponin testing, and validated risk-stratification tools (e.g., the HEART score) may improve triage efficiency and reduce missed diagnoses while limiting unnecessary admissions for low-risk patients (Backus et al., 2010; Mahler et al., 2015).

Limitations

This study has several limitations. As a retrospective, single-centre design, findings depended on the completeness and accuracy of medical records and may have limited generalisability to other settings. Long-term follow-up, mortality outcomes, cardiovascular risk-factor profiles (smoking, diabetes, dyslipidaemia), and patient-reported outcomes could not be assessed. Prospective, multicentre studies incorporating standardised risk-stratification tools and longitudinal follow-up are warranted to validate and extend these findings.

CONCLUSION

Chest pain remains a common and high-acuity ED presentation. In this tertiary care cohort, ischaemic heart disease—particularly angina, STEMI, and ACS—constituted the predominant diagnostic burden, with a marked male preponderance and increasing diagnostic severity with advancing age. More than one-third of patients required catheterisation laboratory transfer, and nearly half underwent invasive cardiac intervention. These findings support strengthening standardised chest pain evaluation pathways, ensuring rapid access to electrocardiography and cardiac biomarkers, and maintaining round-the-clock catheterisation laboratory availability in similar tertiary care settings.

DECLARATIONS

Ethical Approval: Given the retrospective design, a waiver of informed consent was obtained.
Consent for Publication: Not applicable.
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Conflict of Interest: The authors declare no conflict of interest.
Author Contributions: AA: data collection, data curation, manuscript drafting. IK: study conception, supervision, manuscript review. AJ: study design, statistical guidance, manuscript review and editing. All authors approved the final manuscript.

Data Availability: The datasets used and/or analysed during the current study are available from the corresponding author upon reasonable request.

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REFERENCES

1. Amsterdam, E. A., Wenger, N. K., Brindis, R. G., et al. (2014). 2014 AHA/ACC guideline for the management of patients with non-ST-elevation acute coronary syndromes. *Journal of the American College of Cardiology, 64*(24), e139–e228.
2. Backus, B. E., Six, A. J., Kelder, J. C., et al. (2010). A prospective validation of the HEART score for chest pain patients at the emergency department. *International Journal of Cardiology, 148*(3), 301–306.
3. Bandstein, N., Ljung, R., Johansson, M., et al. (2014). Undetectable high-sensitivity cardiac troponin T and risk of myocardial infarction. *Journal of Internal Medicine, 275*, 467–476.
4. Canto, J. G., Shlipak, M. G., Rogers, W. J., et al. (2000). Prevalence, clinical characteristics, and mortality among patients with myocardial infarction presenting without chest pain. *JAMA, 284*(10), 1255–1260.
5. Collet, J. P., Thiele, H., Barbato, E., et al. (2023). 2023 ESC guidelines for the management of acute coronary syndromes. *European Heart Journal, 44*(38), 3720–3826.
6. Dawber, T. R. (1980). *The Framingham study: The epidemiology of atherosclerotic disease*. Harvard University Press.

7. Fox, K. A., Dabbous, O. H., Goldberg, R. J., et al. (2006). Prediction of risk of death and myocardial infarction in the six months after presentation with acute coronary syndrome: GRACE registry. *BMJ, 333*, 1091.
8. Goodacre, S., Cross, E., Arnold, J., et al. (2005). The health care burden of acute chest pain. *Emergency Medicine Journal, 22*, 430–433.
9. Gulati, M., Levy, P. D., Mukherjee, D., et al. (2021). 2021 AHA/ACC guideline for the evaluation and diagnosis of chest pain. *Circulation, 144*(22), e368–e454.
10. Hermann, L. K., Weingart, S. D., Duvall, W. L., et al. (2010). Diagnostic evaluation of patients with chest pain. *The American Journal of Medicine, 123*(5), 399–406.
11. Hollander, J. E., Chase, M., Brown, A. M., et al. (1999). Cardiac risk stratification of patients with chest pain. *Academic Emergency Medicine, 6*, 135–145.
12. Mahler, S. A., Riley, R. F., Hiestand, B. C., et al. (2015). The HEART pathway randomized trial: Identifying emergency department patients with acute chest pain for early discharge. *Critical Pathways in Cardiology, 14*(3), 109–114.
13. Roffi, M., Patrono, C., Collet, J. P., et al. (2016). ESC guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation. *European Heart Journal, 37*(3), 267–315.
14. Swap, C. J., & Nagurney, J. T. (2005). Value and limitations of chest pain history in the evaluation of patients with suspected acute coronary syndromes. *Annals of Emergency Medicine, 45*(3), 278–286.
15. Thygesen, K., Alpert, J. S., Jaffe, A. S., et al. (2018). Fourth universal definition of myocardial infarction. *European Heart Journal, 40*(3), 237–269.