



STUDY OF PROFILE OF ARRHYTHMIAS IN PATIENTS PRESENTING WITH CHEST PAIN IN EMERGENCY ROOM

Dr. Rochelle Francis Colaco*

Junior Resident, Department of Emergency Medicine MGM Institute Of Health Sciences, Kamothe, Navi Mumbai. *Corresponding Author

Dr. Abdul Haris KK

Senior Resident, Department of Emergency Medicine MGM Institute Of Health Sciences, Kamothe, Navi Mumbai.

Dr. D. B. Bhusare

Professor and Head Of Department, Department of Emergency Medicine MGM Institute Of Health Sciences, Kamothe, Navi Mumbai.

Dr. Sagar Sinha

Professor, Department of Emergency Medicine MGM Institute Of Health Sciences, Kamothe, Navi Mumbai.

ABSTRACT

Introduction: Chest pain is a common emergency symptom, often linked to cardiac arrhythmias—irregular heart rhythms ranging from benign to life-threatening. Understanding the prevalence and types of arrhythmias in these patients is vital for accurate diagnosis and timely treatment. Electrolyte imbalances are key contributors, especially in potassium, magnesium, and calcium. This study aims to explore the distribution of arrhythmias and associated electrolyte abnormalities in adults with chest pain, enhancing clinical decision-making and improving emergency care outcomes. **Material And Methods:** This prospective cohort study, conducted over 11 months at MGM Medical College, Navi Mumbai, examined arrhythmias in chest pain patients aged 18–75. ECG-confirmed cases were included, with data on symptoms, electrolytes, and outcomes collected. Ethical approval and informed consent were obtained to enhance emergency arrhythmia diagnosis and management. **Result:** Among 116 patients, tachyarrhythmias were most common (56.9%), with Atrial Fibrillation (36.21%) being the leading type. Electrolyte imbalances were frequent: hypokalemia (28.5%), hypocalcemia (18.97%), and hypomagnesemia (14.66%). Specific arrhythmias correlated with each imbalance, highlighting the importance of electrolyte monitoring in managing emergency arrhythmia cases. **Conclusion:** A study of 116 chest pain patients found tachyarrhythmias (64.65%) common, with Atrial Fibrillation (36.21%) prevalent. Electrolyte imbalances—hypokalemia, hypocalcemia, hypomagnesemia—were linked to specific arrhythmias, highlighting clinical importance. Tachyarrhythmias predominated (64.65%), with atrial fibrillation being the most common subtype. Bradyarrhythmias were also significant (31.89%), mainly Complete AV Block. These results highlight the complexity of arrhythmias in emergencies and the need for tailored management approaches.

KEYWORDS : Chest pain, Cardiac arrhythmias, Hypokalemia, Hypocalcemia, Hypomagnesemia

INTRODUCTION

Chest pain is a frequent emergency department presentation, often linked to various cardiac and non-cardiac causes. Among cardiac conditions, arrhythmias—irregular heart rhythms—are significant but sometimes underrecognized. These range from benign palpitations to severe conditions like ventricular tachycardia and atrial fibrillation. Timely identification and management are essential to prevent complications and improve patient outcomes. Understanding the prevalence and characteristics of arrhythmias in chest pain patients supports accurate diagnosis and targeted treatment. Electrolyte imbalances, particularly involving potassium, magnesium, and calcium, are important contributors to arrhythmia development. Assessing these biochemical parameters in patients presenting with chest pain and arrhythmias can uncover reversible causes, facilitating restoration of normal cardiac rhythm. This study aims to evaluate the types and frequency of arrhythmias alongside associated electrolyte disturbances in adults presenting with chest pain in the emergency department. Such insights can enhance diagnostic precision and optimize management strategies, ultimately improving patient care and outcomes.

AIM OF THE STUDY

To study of profile of arrhythmias in patients presenting with chest pain in emergency room

MATERIAL AND METHODS

This prospective cohort study was conducted from August 2022 to June 2023 in the Emergency Department of MGM Medical College and Hospital, Navi Mumbai. It aimed to characterize arrhythmias in adults aged 18–75 presenting with chest pain. A sample of 116 patients with ECG-confirmed

arrhythmias and informed consent was included. Data on demographics, symptoms, medical history, ECG findings, serum electrolyte levels (potassium, calcium, magnesium), and clinical outcomes were collected using a structured proforma. Emergency physicians performed initial screenings, cardiologists interpreted ECGs, and laboratory tests followed standard protocols. Ethical approval no- DHR-EC/SC/2023/07/19 ensured confidentiality and adherence to guidelines. Statistical analysis involved descriptive statistics, chi-square tests, and logistic regression to determine arrhythmia prevalence and its association with cardiac and non-cardiac conditions. The study also explored electrolyte imbalances in arrhythmic patients, providing important insights for improved emergency diagnosis and management strategies.

OBSERVATION AND RESULTS

Table 1: Type Of Arrhythmia Among Study Participants

Type of arrhythmia	Frequency (n=116)	Percentage (%)
Tachyarrhythmia	75	64.65%
Brady arrhythmia	37	31.89%
Combine arrhythmia	4	3.45%
Total	116	100%

Among the study participants (n=116), the distribution of arrhythmias reveals that Tachyarrhythmias are predominant, constituting 56.90%. Bradyarrhythmias follow at 36.21%, while combined arrhythmia is observed in 3.45% of cases.

Table 2: Specific Arrhythmia Among Study Participants

Specific Type Of Arrhythmia	Frequency (n=116)	Percentage (%)
Atrial Fibrillation	42	36.21%
Atrial Flutter	8	6.90%

Complete AV Block	19	16.38%
Mobitz II AV Block	4	3.45%
SVT	22	18.97%
VT	17	14.66%
VF	4	3.45%

The specific breakdown of arrhythmia types among the study participants (n=116) is as follows: Atrial Fibrillation (36.21%), Atrial Flutter (6.90%), Complete AV Block (16.38%), Mobitz II AV Block (3.45%), Supraventricular Tachycardia (SVT) (18.97%), Ventricular Tachycardia (VT) (14.66%), and Ventricular Fibrillation (VF) (3.45%).

Table 3: Incidence Of Electrolyte Imbalance Among Study Participants

Electrolyte imbalance	Frequency	Percentage (%)
Hypokalemia	33	28.5%
Hypocalcemia	22	18.97%
Hypercalcemia	0	0%
Hyperkalemia	1	0.86%
Hypomagnesaemia	17	14.66%
Hypermagnesaemia	0	0%

In our study, the incidence of electrolyte imbalances was assessed among the study participants, revealing various abnormalities. Hypokalemia was observed in 28.5% of cases while hypocalcemia was identified in 18.97% of participants, and hyperkalemia was noted in 0.86%. Additionally, hypomagnesaemia was present in 14.66% of individuals. These findings emphasize the prevalence of electrolyte disturbances in the study cohort, highlighting the importance of monitoring and managing electrolyte levels in patients with arrhythmia.

Table 4: Incidence Of Arrhythmias In Hypokalemia

Types of Arrhythmias	Frequency	Percentage
VT	10	30.30
Complete AV Block	10	30.30
Atrial Fibrillation	5	15.15
SVT	4	12.12
Atrial Flutter	2	6.06
VF	2	6.06

In our study on the incidence of arrhythmias in hypokalemia, Ventricular Tachycardia (VT) and Complete AV Block were the most common types, each occurring in 30.30% of cases. Atrial Fibrillation accounted for 15.15% of the cases, while Supraventricular Tachycardia (SVT) occurred in 12.12%. Atrial Flutter and Ventricular Fibrillation (VF) each accounted for 6.06% of the cases.

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Table 5: Incidence Of Arrhythmias In Hypocalcemia

Types of Arrhythmias	Frequency	Percentage
Complete AV Block	8	36.36
Atrial Fibrillation	8	36.36
VT	2	9.09
SVT	2	9.09

VF	1	4.55
Mobitz II AV Block	1	4.55

In our study on the incidence of arrhythmias in hypocalcaemia, Complete AV Block and Atrial Fibrillation were the most common types, each occurring in 36.36% of cases. Ventricular Tachycardia (VT) and Supraventricular Tachycardia (SVT) each accounted for 9.09% of the cases, while Ventricular Fibrillation (VF) and Mobitz II AV Block each occurred in 4.55% of the cases.

Table 6: Incidence Of Arrhythmias In Hypomagnesaemia

Types of Arrhythmias	Frequency	Percentage
Atrial Fibrillation	11	64.71
SVT	4	23.53
VT	1	5.88
Mobitz II AV Block	1	5.88

In our study on the incidence of arrhythmias in hypomagnesaemia, Atrial Fibrillation was the most common type, occurring in 64.71% of cases. Supraventricular Tachycardia (SVT) followed with 23.53%, while Ventricular Tachycardia (VT) and Mobitz II AV Block each accounted for 5.88% of the cases.

DISCUSSION

In our study, tachyarrhythmias were predominant, representing 64.65% of cases, with Atrial Fibrillation (31.89%) as the most common subtype, aligning with findings from Doku et al., Reinelt et al., and Stiel et al. Bradyarrhythmias accounted for 31.89%, with Complete AV Block as the leading subtype, differing from D'Ascenzo et al.'s focus on bradyarrhythmias in syncope patients. Electrolyte imbalances were common: hypokalemia (28.5%), hypocalcemia (18.97%), and hypomagnesaemia (14.66%). Studies by Rafaqat et al. and Laslett et al. emphasize the critical role of potassium and magnesium disturbances in exacerbating arrhythmias such as AF, ventricular tachycardia, and ventricular fibrillation. These results underscore the importance of rhythm control strategies and stroke prevention in AF, along with vigilant electrolyte monitoring. Combining clinical assessment with biochemical evaluation can improve arrhythmia management and patient outcomes, enabling timely and tailored interventions in emergency settings.

CONCLUSION

A prospective observational cross-sectional study at MGM Medical College, Navi Mumbai, from August 2022 to June 2023 examined cardiac arrhythmias in adults aged 18 to 75 presenting with chest pain in the emergency department. The study aimed to determine the prevalence of various arrhythmias and their association with electrolyte imbalances. Data from consenting patients included demographics, symptoms, ECG-confirmed arrhythmias, and serum levels of potassium, calcium, and magnesium. The results indicated that tachyarrhythmias accounted for 64.65% of cases, with Atrial Fibrillation being the most common subtype (36.21%), followed by Supraventricular Tachycardia (18.97%) and Complete AV Block (16.38%). Bradyarrhythmias comprised 31.89%, with Complete AV Block being most frequent. Electrolyte disturbances were notable, particularly hypokalemia (28.5%), which was strongly linked to Ventricular Tachycardia and Complete AV Block. Hypocalcemia and hypomagnesaemia were also observed, with Atrial Fibrillation common in these cases. These findings highlight the complexity of arrhythmias in emergency settings and the need for monitoring electrolyte imbalances for effective patient management.

LIMITATIONS

1. The study was limited to a single center, which may affect the generalizability of the findings.
2. Data collection depended on electronic medical records,

potentially causing inaccuracies or missing information.

3. The research mainly focused on demographic and clinical features, with limited insight into the underlying mechanisms of arrhythmias.

4. Long-term outcomes related to arrhythmias were not evaluated.

5. These limitations could impact the overall validity of the results.

6. Future studies should adopt prospective, multicenter designs for broader applicability.

7. A more comprehensive approach to data collection and analysis is needed to enhance understanding and reliability.

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