How to Cite:
Chandregowda, C., Unnikrishnan, A., & Rajan, S. (2022). A study of arrhythmias and its outcome in patients with acute coronary syndrome. *International Journal of Health Sciences*, *6*(S7), 2038–2045. https://doi.org/10.53730/ijhs.v6nS7.11748

A study of arrhythmias and its outcome in patients with acute coronary syndrome

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***Abstract*---**Aim: To detect arrhythmia during hospitalization of patients with acute coronary syndrome and to correlate the association between arrhythmia and patient outcome. Introduction: Acute coronary syndrome represents a Global Pandemic, and is intimidating large as the new epidemic afflicting population worldwide, especially in the Indian sub-continent. Studies have shown that arrhythmias are important predictors of poor outcome in patients with ACS and are associated with higher in-hospital mortality. So, ECG is of great value in patients with acute MI and is essential for risk stratification and selection of optimal management. Methods: A Prospective clinical study consisting of 100 patients of acute coronary syndrome were admitted in ICCU of Mandya Institute of medical Sciences, Mandya who are aged between 18 –50yrs during the period of study (January 2018 to December 2018, a period of 12 months) were taken to determine the occurrence of arrhythmia, its predictors and outcome. Patients were assessed with Characteristic history, ECG criteria and Elevated cardiac enzymes. Results: A total of 100 patients are taken, on admission to the intensive coronary care unit at Mandya Institute of Medical Sciences, Mandya. They included 56 males and 44 females (52%).The median age of the population included is 45.19±4.91yrs, minimum age was 23yrs and maximum age was 50yrs. In this study 56% of arrhythmia occurred during the 1st hour, 24% of patients had arrhythmias during 12-24 hours, 19% of patients had arrhythmias after 24 hours. Also, high systolic blood pressure and diastolic blood pressure at the time of

presentation increases the risk of developing arrhythmia. Most patients (41%) with anterior wall MI developed arrhythmia. The most common arrhythmia was VPCs (25%) followed by sinus tachycardia (17%). Most of the arrhythmias underwent spontaneous resolution (60%), except few required electrical interventions(6%). Conclusion: Arrhythmias associated with ACS are common, and can lead to a poorer prognosis. With advancement of modern techniques, we now provide more support to these patients. Patients with ACS seem to have fewer serious arrhythmias today, which may have implications for the appropriate use of continuous ECG monitoring.

***Keywords*---**Arrhythmias, Acute Coronary Syndrome, Myocardial infarction.

Introduction

Acute Coronary Syndrome (ACS) represents a Global epidemic, and is intimidating large as the new epidemic afflicting population worldwide, especially in the Indian sub-continent. CAD affects Indians with greater frequency and at a younger age than in the developed countries, as well as many other developing countries. It is estimated that ACS will become a major cause of death in all the regions of the world. Many of these deaths are attributed to the development of arrhythmias during periods of myocardial infarction.

Acute Coronary Syndromes (ACS) represent an emerging epidemic in India. With increase in prevalence of risk factors such as obesity, diabetes, hypertension, dyslipidemia and others; there is parallel increase in the incidence of ACS.[1]

As a leading cause of morbidity and mortality ACS is a major public health problem. It is estimated that ACS will become a major cause of death in all the regions of the world.[2]

Methods

A Prospective clinical study consisting of 100 patients of acute coronary syndrome were taken to determine the occurrence of arrhythmia, its predictors and outcome.

All cases of ACS admitted in ICCU of Mandya Institute of medical Sciences, Mandya during the period of study (January2018toDecember2018,a period of 12 months) were taken in the study. All cases of ACS with age, less than 50yrs and more than18yrs,admitted in ICCU of MIMS, Mandya were studied.

Results

A total of 100 patients were taken, on admission to the intensive coronary care unit, aged between 18 to 50 yrs at Mandya Institute of Medical Sciences, Mandya. They included 56 males and 44 females.

Table 01
Distribution of presenting complaints of the patients in emergency department

Presenting symptom	Count	Percentage (%)
Chest pain	92	92%
Shortness of breath	58	58%
Jaw, Neck, Arm or back pain	52	52%
Palpitations	48	48%
Diaphoresis	62	62%
Nausea and vomiting	38	38%
Syncope	10	10%

Most patients (92%) experienced chest pain as one of the presenting symptom to the ED. Over half of the patients experienced shortness of breath (58%) and jaw, neck, arm, or back pain (52%).

In this study acute coronary syndrome was common among males than females. The median age of the population included is 45.19±4.91yrs, minimum age was 23yrs and maximum age was 50yrs.This study showed acute coronary syndrome was more common among age group more than 45 years (47%) and only 4% in age less than 35yrs.

Table 02
Age wise distribution of the sample (N = 100)

Age in Years	Count	Percentage (%)
<=35 Years	4	4.0
36-40 years	21	21.0
41-45 Years	28	28.0
>45 years	47	47.0
Total	100	

Table 03
Sex distribution of the sample (N = 100)

Sex	Count	Percentage (%)
Female	44	44.0
Male	56	56.0
Total	100	

Table 04
Distribution of types of acute coronary syndrome

Type of ACS	Count	Percentage (%)
NSTEMI	24	24.0
STEMI	62	62.0
UA	14	14.0
Total	100	

Figure 01: Graph showing occurrence of Arrhythmia in patients with ACS

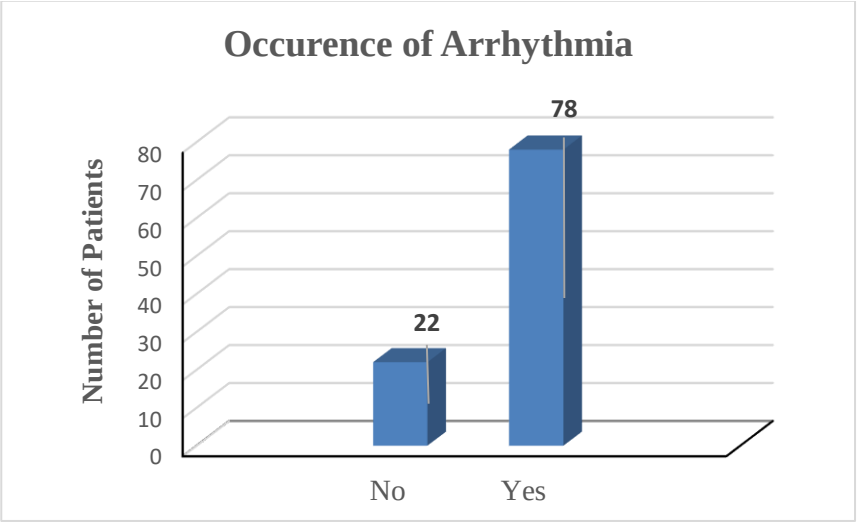
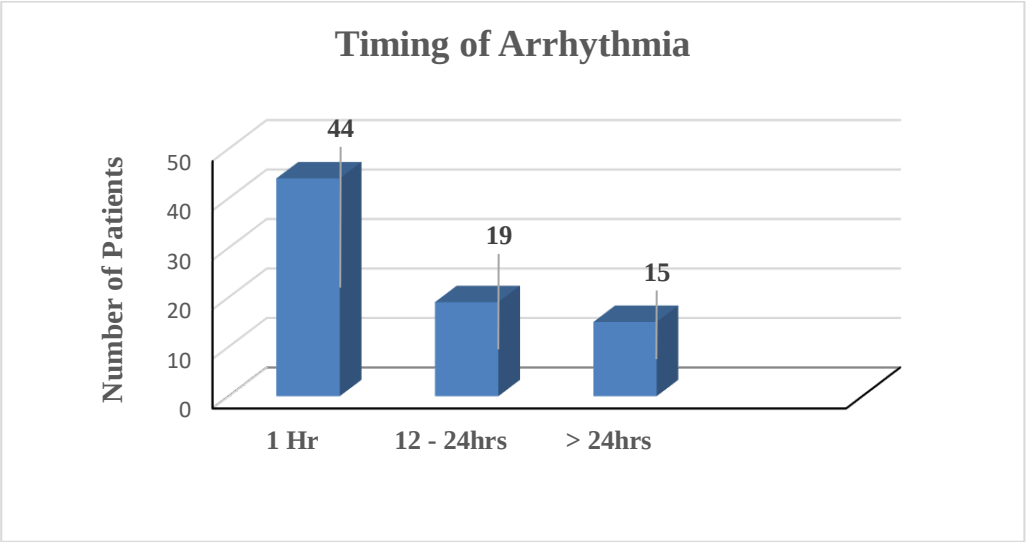


Figure 02: Distribution of timing of Arrhythmia after admission



In this study 56% of arrhythmia occurred during the 1st hour, 24% of patients had arrhythmias during 12-24 hours, 19% of patients had arrhythmias after 24 hours.

Figure 02: Frequency of distribution of specific Arrhythmia

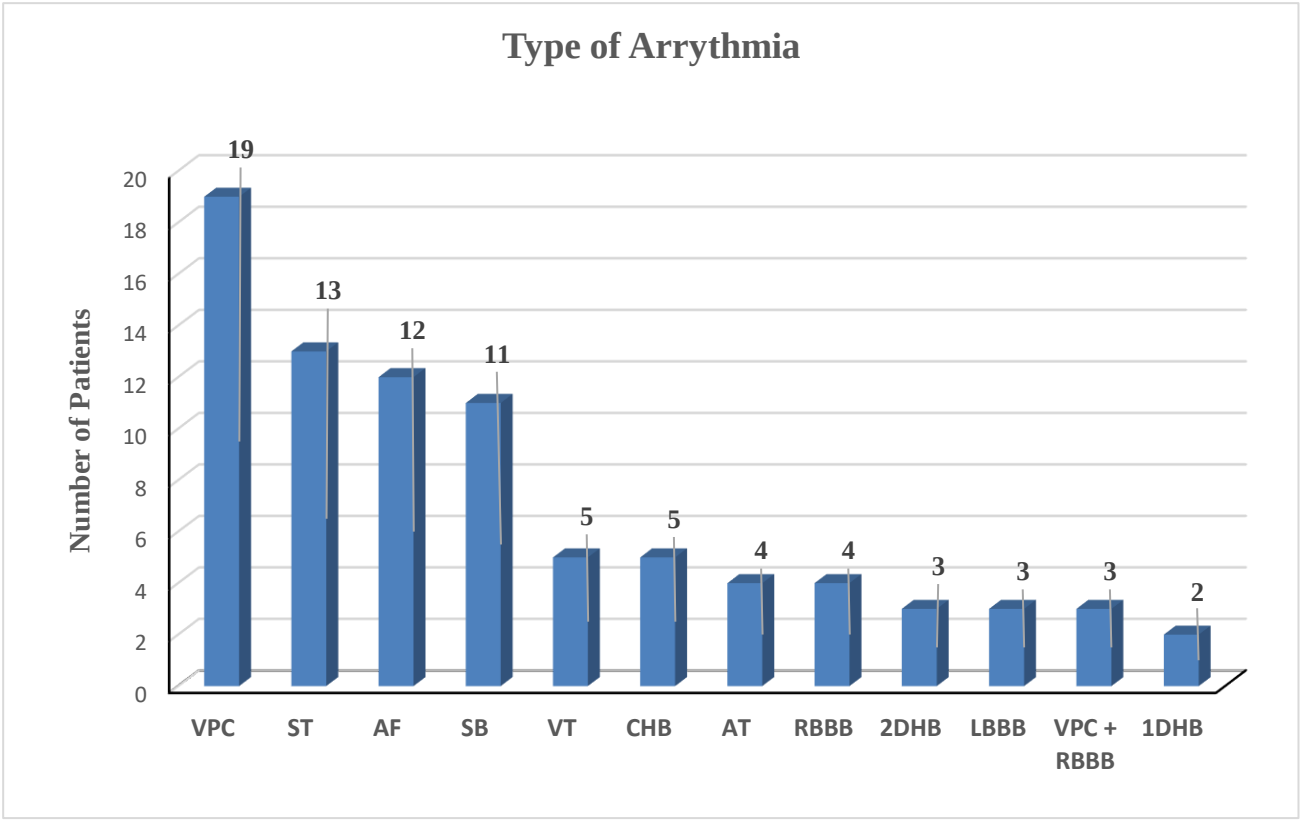


Table 06
Comparison of Arrhythmia in patients with Dyslipidemia and Normal lipid profile

Hyperlipidemia	Arrhythmia		No Arrhythmia	
	Count	Percentage (%)	Count	Percentage (%)
Yes	61	78.21	3	13.64
No	17	21.79	19	86.36
Total	78		22	

Table 07
Comparison of Arrhythmia with type of Acute coronary syndrome

Type of ACS	Arrhythmia		No Arrhythmia	
	Count	Percentage (%)	Count	Percentage (%)
NSTEMI	18	23.08	6	27.27
STEMI	55	70.51	7	31.82
UA	5	6.41	9	40.91
Total	78		22	

Discussion

The current study is a descriptive study and included 100 young patients with acute coronary syndrome. Patients were evaluated with special reference to the pattern of cardiac arrhythmias in acute coronary syndrome during hospitalization. In present study the most common presenting symptom to the ED was chest pain, followed by shortness of breath and diaphoresis.

The study done by Catherine Winkler et al on "Arrhythmias in Patients with Acute Coronary Syndrome in the First 24 Hours of Hospitalization" showed the mean patient age was 66 years and half of the patients identified White as their race. There were more males than females and most patients (92%) experienced chest pain as one of the presenting symptom to the ED. Over half of the patients experienced shortness of breath (68%) and jaw, neck, arm, or back pain (55%).[3]

In this study 78 patients had arrhythmia and 56% of arrhythmia occurred in the first one hour. Article by Julia Hubbard[4] about complications of myocardial infarction showed dysrhythmias are experienced more frequently than any other MI complication, with the incidence of some type of disturbance at virtually 100

per cent. Most of the arrhythmias occur within first 24hrs of myocardial infarction.

The most common type of arrhythmia was ventricular premature complexes followed by sinus tachycardia and atrial fibrillation. A study by Justin Bhar Amato et al[5] showed ventricular tachyarrhythmia's (VAs) are the most commonly arrhythmia occur early in ischaemia, and patients presenting with an acute MI and ventricular arrhythmias are a group that has a significantly increased risk of mortality. In a study by Volpi A. et al [6] approximately 36% of patients with acute myocardial infarct ion presented with less than one premature ventricular beat per hour in Holter, whereas almost 20% of patients showed frequent (more than 10 premature ventricular beats per hour).

VPCs and sinus tachycardia are the most common arrhythmias recorded in these patients. In a study by Irwin JM [7], sinus tachycardia was observed in upto30% of the patients. In a study by Echt DS et al [8] and the CAST investigators, 20% of patients had non-sustained VT and only 10% had more than one run of VT in 24 hours. In this study only 5% had ventricular arrhythmia.

Studying arrhythmias in hospitalized cases of acute coronary syndrome is an indirect estimate of mortality and assumes significance because true mortality due to acute coronary syndrome is difficult to ascertain in the community due to inadequate reporting and low autopsy rates.

Indians show higher incidence of mortality than other ethnic groups. Also, South Indians have higher prevalence. The conventional risk factor namely age, sex, hypertension, diabetes mellitus, smoking and alcohol .

Limitations Of The Study

- Large sample size is required
- Continuous ECG monitoring is required

Conclusion

Arrhythmias associated with ACS are common, and may be relate to more complicated comorbidity and more severe impairment of myocardium, and lead to a poorer prognosis. With advancement of modern techniques, we now provide more support to these patients. More attention should be paid to these patients to improve their treatment and prognosis.

Hypertension, Diabetes, dyslipidemia, and smoking are important predictors for development of ACS and arrhythmias. ACS involving anterior wall, is associated with increased risk of arrhythmias and mortality.

References

1. Bhar-Amato J, Davies W, Agarwal S. Ventricular arrhythmia after acute myocardial infarction: 'The Perfect Storm'. Arrhythmia & electrophysiology review. 2017 Aug; 6(3):134.
2. Boersma E, Mercado N, Poldermans D, Gardien M, Vos J, Simoons ML. Acute myocardial infarction. The Lancet. 2003 Mar 8:361(9360):847-58.
3. Henkel DM, Witt BJ, Gersh BJ, Jacobsen SJ, Weston SA, Meverden RA, Roger VL. Ventricular arrhythmias after acute myocardial infarction: a 20-year community study. American heart journal. 2006 Apr 1; 151(4):806-12.
4. Hubbard J. Complications associated with myocardial infarction. Nursing times. 2003; 99(15):28-9.
5. Irwin JM. In-hospital monitoring and management of arrhythmias following thrombolytic therapy. Califf RM, Mark DB. Wagner GS (eds). Acute coronary care in the thrombolytic era, Chicago. 1988.
6. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. PLoS medicine. 2006 Nov 28:3(11):e442.
7. NACCARELLLI GV, Wolbrette DL, Dell'Orfano JT, Patel HM, Luck JC. Adecade of clinical trial developments in post myocardial infarction, congestive heart failure, and sustained ventricular tachyarrhythmia patients: from CAST to AVID and beyond. Journal of cardiovascular electrophysiology. 1998 Aug; 9(8):864-91.
8. Suryasa, I. W., Rodríguez-Gámez, M., & Koldoris, T. (2021). Get vaccinated when it is your turn and follow the local guidelines. *International Journal of Health Sciences*, *5*(3), x-xv. https://doi.org/10.53730/ijhs.v5n3.2938
9. Winkler C, Funk M, Schindler DM, Hemsey JZ, Lampert R, Drew BJ.Arrhythmias in patients with acute coronary syndrome in the first 24 hours of hospitalization. Heart & Lung. 2013 Nov 1; 42(6):422-7.