International Journal of Research in Medical Sciences
Panchotiya D et al. Int J Res Med Sci. 2023 Oct;11(10):3657-3661
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20233014

Original Research Article

A study of 100 cases of arrthymia in first 48 hours of acute myocardial infarction

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Received: 08 September 2023
Accepted: 27 September 2023

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ABSTRACT

Background: Heart is the principle source of inspiration and focus among lovers and lyricists. Despite impressive strides in diagnosis and management, over last three decades' acute myocardial infarction (AMI) continues to be a major public health problem in developing and developed countries. Cardiac arrhythmias directly and indirectly affect the morbidity and mortality of the patient with myocardial infarction and they are also related to in hospital and late mortality. Aims and objectives were to study the incidence of cardiac arrhythmias in AMI and the influence of various risk factors.
Methods: A cross sectional observational study was conducted among total 100 patients of acute myocardial infarction with arrhythmia within 48 hours of symptom onset, during May 2018 to October 2019.
Results: In our study, among 100 cases studied maximum incidence was in six decades of around 46%. Complications like left ventricular dysfunction and cardiogenic shock are more common with anterior wall infarction combined with inferior wall infarction. Most common risk factor observed was sedentary life style (72%), smoking (48%), IHD (38%), diabetes mellitus and obesity (34%). Mortality rate is 42.86% in complete heart block followed by 33.33 in second degree A-V block type 2.
Conclusions: Myocardial infarction with arrhythmia was most common in sixth decade (46%) and male to female ratio is 3.35:1. Chest pain (96%), dyspnoea (54%), perspiration (59%), nausea and vomiting (43%) and palpitations (16%) were also present which should be kept in mind. Most common arrhythmia observed was premature beats and VPC's were more common (37%).

Keywords: Arrthymia, Acute myocardial infarction, Mortality, Location of infarct, prognosis

INTRODUCTION

Acute myocardial infarction (AMI) is a clinical occurrence that occurs when there is myocardial ischemia and myocardial damage is present.[1,2] In India, cardiovascular disease (CVD) is becoming the main cause of death and throughout all regions of India (including the rural areas).[3,4] Indians are affected by CVD ten years before than other Western population.[5-7] Deaths from CVD are expected to increase in India's economy would grow by 111% by 2020 compared to 1990, and this is greater than any other region of the country's anticipated death rate.[8]

Cardiac arrhythmias in AMI are well-known, common sequelae, and significant mortality predictors; they may be brought on by ischemia, which results in conduction blockage in the infarcted zone, or by an imbalance of the autonomic nervous system and electrolytes. Even though in the era of primary percutaneous coronary intervention, the rates of post-myocardial infarction the incidence of conduction abnormalities is low and decreasing, it continues to be associated with high risk for in-hospital deaths, conduction abnormalities, especially high grade atrioventricular block, are a common complication of ST-elevation myocardial infarction (STEMI).[9-11] Within the first 48 hours following myocardial infarction, ventricular

arrhythmias are frequent and continue to have a detrimental effect on the patient's prognosis.[12-14] So, this study was conducted among patients admitted in intensive coronary care unit having AMI with arrhythmias was undertaken to determine the- incidence evaluation, therapeutic response and ultimately mortality and morbidity of various arrhythmias in AMI.

Aims and objectives

Aims and objectives were to study the incidence, various risk factors, mortality and influence of location of infarction among various cardiac arrhythmias in AMI; and to assess the relation of associated complications like ventricular failure and cardiogenic shock on incidence of cardiac arrhythmias as well as evaluate the prognostic value of arrhythmias.

METHODS

A cross sectional observational study was conducted among 100 cases of acute myocardial infarction with arrhythmia within 48 hours of symptom onset from May 2018 to October 2019 at tertiary care Hospital, Surendranagar.

Exclusion criteria

Subjects those who were not willing to participate in study, diagnosed to acute MI and refer to higher center, died within 48 hour of admission, and those who have developed arrhythmia developed due to other morbidity than myocardial infraction were excluded.

Data entry and analysis

Data were collected by pre-tested questionnaires and entered into Microsoft excel sheet. Data were analyzed as descriptive statistics, normality test and Chi square test by using statistical package for the social sciences (SPSS) software. The questionnaire includes clinical history, age, sex, occupation and signs and symptoms of myocardial infarction like chest pain, palpitation, perspiration, nausea, vomiting and breathlessness. Past history and family history pertaining with emphasis on hypertension, diabetes mellitus, ischemic heart disease and hyperlipidemia. Personal history of sedentary life, sleep, diet, smoking, and addiction were included. Physical examination was performed with emphasis on cardiovascular and respiratory system.

RESULTS

Among 100 cases studied maximum incidence was in six decades of around 46%. The youngest patient was 24-year-old, while the oldest was 77-year-old. So, arrhythmias in AMI were more common during the sixth decade (Table 1).

Table 1: Age distribution in acute myocardial infarction with arrhythmia.

Age in years	No. of cases	Percentage
21 to 30	1	1
31 to 40	4	4
41 to 50	28	28
51 to 60	46	46
61 to 70	17	17
71 to 80	4	4
More than 80	0	0

It shows there is no significant association between symptoms and anatomical site. In this study, the majority of the cases, i.e. 96% had common presentingsymptom of chest pain (Table 2).

It shows there is no significant association between complication with anatomical site. Complications like left ventricular dysfunction and cardiogenic shock are more common with anterior wall infarction combined with inferior wall infarction (100%) as compared to anterior wall (43.75 %) and inferior wall (25%) and the overall complications were 44% (Table 3).

Table 2: Incidence of the presenting symptoms.

Symptoms	No. of cases	Anterior wall	Inferior wall	Ant+inf wall	Total percentage
Chest pain	96	62	30	4	96
Dyspnea	54	32	20	2	54
Perspiration	59	38	19	2	59
Palpitation	16	09	07	0	16
Nausea/vomiting	43	27	13	3	43

Chi square=2.92, p=0.99

Table 3: Incidence of various complications in relation to anatomical site.

Complications	Anterior wall (%)	Inferior wall (%)	Ant+inf wall (%)	Total (%)
Left ventricular dysfunction	21 (32.81)	04 (12.5)	04 (100)	29 (29)
Cardiogenic shock	07 (10.94)	04 (12.5)	04 (100)	15 (15)
Total	28 (43.75)	08 (25)	08 (100)	44 (44)

Chi square=2.83, p=0.24

Most common risk factor observed was sedentary life style (72%), smoking (48%), IHD (38%), Diabetes mellitus and obesity (34%). Other risk factors are hypertension (21%), hyperlipidemia (17%) (Figure 1).

Most common arrhythmia in inferior wall is complete heart block atrial and ventricular premature beats (21.88%) followed by atrial fibrillation and LBBB (12.50%). Mortality rate is 42.86% in complete heart block followed by 33.33 in second degree A-V block type 2 (Table 4).

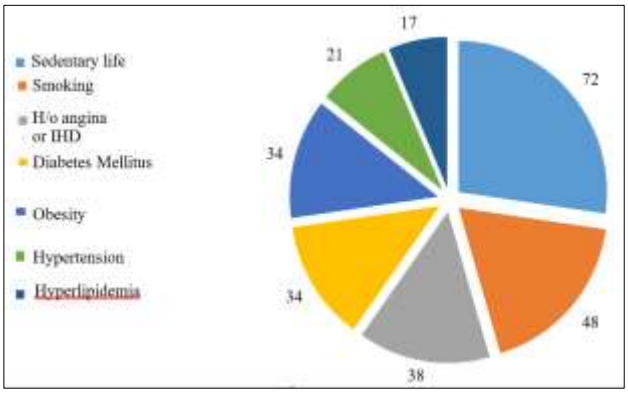

Figure 1: Risk factor.

Table 4: Incidence of arrhythmia in inferior wall infarction.

Type of arrhythmia	No. of cases	%	No. of deaths	%
Ventricular premature beats	07	21.88	0	0
Complete heart block atrial	07	21.88	03	42.86
Atrial fibrillation	04	12.50	01	25
LBBB	04	12.50	01	25
Second degree A-V block type 2	03	9.38	01	33.33
First degree A-V block	02	6.25	0	0
Ventricular tachycardia	02	6.25	0	0
Second degree A-V block type 1	02	6.25	0	0
Atrial premature beats	01	3.125	0	0

Table 5: Incidence of mortality in relation to location of infarction.

Location	Mortality	Percentage
Anterior wall	15	23.44
Inferior wall	05	15.63
Anterior + inferior wall	03	100

The table shows higher mortality in anterior wall (23.44%) than inferior wall (15.63%), while highest was observed in combined anterior and inferiorwall infarction (100%) (Table 5).

DISCUSSION

In present study the incidence in male and female ratio is 3.35:1 consistent with Fluck et al and Roy's et al findings.[15,16] The onset of symptomatic coronary artery disease is typically a decade earlier in men than in women. The premenopausal women are protected from coronary artery disease because of the high level of HDL. After menopause the risk of coronary artery disease increases in women to reach equal to that of men in 7th or 8th decade.[17] In this study anterior wall infarction was observed in 64%, inferior wall infarction in 32% and combined in 4% of cases that is consistent with result of Imperial et al study.[18]

Chest pain is the most common presenting symptom (96%) with dyspnoea (54%) and nausea and vomiting (43%) and is consistent with Yater et al and Wright et al.[19,20] It was believed that accumulation of lactic acid and substance P dueto anaerobic glycolysis in the ischemic tissue stimulated the afferent nerves and caused pain. Although chest pain was the most common presenting symptom, the type did vary from person to person.

While APC's in our study (08%) is comparable with Pick et al (7.25%), Master et al (5%) and Hurcaitz et al (6%).[21-23] Due to imbalance in autonomic nervous system and electrolytes arising because of myocardial infarction, the commonest abnormality seen is abnormal and enhanced automaticity leading to premature contraction and thus, they are found to be the most common arrhythmia. It is possible that partial depolarization and failure to reach the maximal diastolic potential can induce automatic discharge in most of the cardiac fibres.

The mortality from bundle branch block associated with myocardial infarction in present study (50%) is comparable with Hunt and Soloman et al (56%).[24] The incidence of bundle branch block sums up both right and left bundle branch blocks. These bundle branch blocks were associated with higher mortality as well because the right bundle and posterior divisions of left bundle branch have common but dual blood supply from both right coronary and left anterior descending branch of left coronary artery. Hence, if all these vessels were blocked extensive amount of myocardium is damaged leading to higher mortality.

CONCLUSION

Myocardial infarction with arrhythmia was most common in Sixth decade (46%) and male to female ratio is 3.35:1. Incidence of arrhythmia with anterior wall infarction was more common (64%) than with Inferior wall infarction (32%) and with combined anterior and inferior wall infarction is (4%). Most common arrhythmia observed was

premature beats and VPC's were more common (37%). Conduction disturbances were common in inferior wall infarction (43.76%) as compare to anterior wall infarction (6.25%).

Ventricular premature beats (30%), atrial premature beats (7%), atrial fibrillation (10%), ventricular tachycardia (8%) are more common with anterior wall infarction. While 1st degree A-V block (2%), 2nd degree A-V block type 2 (3%) and complete heart block (7%) are more common with inferior wall infarction. Arrhythmia carrying very high mortality includes ventricular fibrillation (100%), ventricular tachycardia (66.67%) and bundle branch block (50%). Thus, it can be seen that various types of arrhythmias and conduction disturbances are commonly observed with acute myocardial infarction. Early detection and prompt management of such disturbances is needful in reducing the mortality.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Panchotiya D, Sadatiya M. A study of 100 cases of arrthymia in first 48 hours of acute myocardial infarction. Int J Res Med Sci 2023;11:3657-61.