ORIGINAL RESEARCH PAPER VOLUME-6 | ISSUE-8 | AUGUST - 2017 | ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

CLINICAL PROFILE OF CARDIAC ARRHYTHMIA WITH MYOCARDIAL INFARCTION IN INTENSIVE CARE CORONARY UNIT

General Medicine

Dr. Urvesh A Mistry Assistant professor, Department of medicine, B J medical college & civil hospital, Ahmedabad.

Dr. Krunal A Talsaniya Assistant professor, Department of medicine, B J medical college & civil hospital, Ahmedabad.- Corresponding Author

ABSTRACT

Background & objectives: Cardiac arrhythmia complicating Acute MI is associated with adverse prognosis. We analyzed profile of patients admitted in ICCU with Acute MI in tertiary care hospital, Gujarat to evaluate incidence, relationship between location of infarction and associated arrhythmia and their impact on mortality.

Materials & Methods: Patients are assessed with Clinical history, Physical examination, necessary lab investigation & ECG. Acute MI and Various types of arrhythmias are diagnosed by ECG and on cardiac monitor. IF any rhythm disturbance is detected, it is recorded immediately.

Results: Cardiac arrhythmia is common in 6th Decade & in male (M: F 4.55:1). VPCs is most common arrhythmia observed. Conduction block is more common with inferior than with anterior infarction. VPCs in anterior infarction While 2nd degree type 2 A-V block is most common arrhythmia in inferior wall infarction. Arrhythmia with Combined Anterior and Inferior wall infarction carries bad prognosis.

Conclusions: Cardiac arrhythmia with Acute MI is common in old age & in male. VPC is most common arrhythmia observed. Conduction block are common with inferior infarction. Arrhythmia with combined anterior and inferior infarction carries bad prognosis.

KEYWORDS:

Arrhythmia, Acute MI (Acute myocardial infarction), location of infarction.

Introduction

Heart is the principle source of focus of not only lovers and lyricist but also of medical professional because when it becomes diseased, it ranks first among major disorders challenging the modern medical science.

Despite impressive strides in diagnosis and management, over last three decades Acute Myocardial Infarction continue to be a major public health problem in developing and developed countries. The incidence of coronary artery disease has reported to be on an increase in India and occur almost a decade earlier in life as compared to the people of western world, as it has been found that Indian in particular and South Asian in general are genetically more susceptible to Atherosclerotic coronary artery disease [7].

Heart is the only organ in the body with inherent automaticity and rhythmicity, which is influenced by numerous changes in the interim of the heart like those due to Myocardial infarction. Cardiac arrhythmias directly and indirectly affected the morbidity and mortality of the patient with myocardial infarction.

This study includes patients admitted in Intensive Coronary Care Unit with Acute Myocardial Infarction with Arrhythmia in tertiary care hospital in Gujarat to evaluate the incidence, relationship between location of infarction and associated arrhythmia & conduction abnormalities and their impact on mortality.

Materials & methods:

This study was conducted on patients admitted in ICCU with acute myocardial infarction with arrhythmia in tertiary care hospital, Gujarat.

Inclusion criteria =
All patients admitted in ICCU with Acute myocardial infarction with arrhythmia

Patients from both rural and urban area with age >18 years are included
Exclusion criteria =
Patients admitted in ICCU having acute myocardial infarction without arrhythmia

Patients admitted in ICCU having arrhythmia without having acute myocardial infarction

Patients requiring angioplasty or pacemaker insertion are excluded.

All patients included in study are evaluated with Clinical history is recorded including age, sex, occupation and signs and symptoms of myocardial infarction like chest pain, gabharaman, palpitation, perspiration, nausea&vomiting, breathlessness. Past history and family history with emphasis on hypertension, diabetes mellitus, ischemic heart disease and hyperlipidemia. Personal history of sedentary life, sleep, diet, smoking, addiction. Physical examination was performed with emphasis on cardiovascular and respiratory system. The necessary laboratory investigation carried out. A '12' lead ECG was taken immediately on admission and once daily and as and when required. Diagnosis of acute myocardial infarction was made according to third universal definition of myocardial infarction [5].

Is rise or fall of cardiac biomarker values [preferably cardiac troponin (cTn)] with at least one value above the 99th percentile URL and with at least one of following

(1) Symptoms of ischemia
(2) New or presumed new significant ST segment –T wave changes or new LBBB
(3) Development of pathological Q wave in the ECG
(4) Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality

Various types of arrhythmias are diagnosed by ECG and on cardiac monitor as per AHA guidelines. Careful search is made to find out any rhythm disorder and if any irregularity is detected, it is recorded immediately.

Results:

TABLE – 1
AGE DISTRIBUTION

AGE IN YEARS	NO. OF CASES	PERCENTAGE
21 to 30	1	1
31 to 40	2	4
41 to 50	12	24
51 to 60	20	40
61 to 70	11	22
More than 70	4	8

Among 50 cases studied maximum incidence was in sixth decade of around 40%. The youngest patient was 28 year old, while the oldest was 75 year old. So acute myocardial infarction with arrhythmia is more common during the sixth decade.

TABLE – 2
SEX DISTRIBUTION

AGE IN YEARS	NO. OF CASES	PERCENTAGE
Male	41	82
Female	09	18

The above table shows that acute myocardial infarction with arrhythmia is more common in male. The ratio is 4.55: 1 (male: female)

TABLE – 3
SHOWING THE INCIDNECE OF ANATOMICAL SITES OF MYOCARDIAL INFARCTION WITH ARRHYTHMIA IN ICCU

ANATOMICAL SITES OF MYOCARDIAL INFARCTION	NO. OF CASES	TOTAL PERCENTAGE
Anterior wall	30	60
Inferior wall	18	36
Ant + Inf. wall	02	04

The table shows that anterior wall infarction with arrhythmia (60%) was more common than the inferior wall infarction (36%).

TABLE – 4
THE TABLE SHOWING THE INCIDENCE OF VARIOUS ARRHYTHMIAS IN CASES OF ACUTE MYOCARDIAL INFARCTION IN ICCU

SR. NO.	TYPES OF ARRHYTHMIA	NO. OF CASES	PERCENTAGE	NO. OF DEAT	PERCENTAGE
1	Ventricular premature contractions	16	32%	0	0
2	Atrial premature beat	04	08%	0	0
3	Atrial fibrillation	07	14%	01	14%
4	Ventricular tachycardia	05	10%	03	60%
5	Second degree A-V block type 1	01	02%	0	0
6	Second degree A-V block type 2	03	06%	02	66.66%
7	First degree A-V Block	02	04%	0	0
8	Bifascicular block	01	02%	0	0
9	RBBB	01	02%	01	100%
10	LBBB	02	04%	01	50%
11	Complete heart block	05	10%	03	60%
12	Ventricular fibrillation	01	02%	01	100%

Above table shows that most common arrhythmia are VPC's (32%), followed by atrial fibrillation (14%), in patients with acute myocardial infarction.

TABLE – 5
THE TABLE SHOWING THE INCIDENCE OF VARIOUS ARRHYTHMIAS IN ANTERIOR WALL MYOCARDIAL INFARCTION IN ICCU.

SR. NO.	TYPES OF ARRHYTHMIA	NO. OF CASES	PERCENTAGE	NO. OF DEAT	PERCENTAGE
1	Ventricular premature contractions	13	43.33	0	0
2	Atrial premature beat	03	10	0	0
3	Atrial fibrillation	05	17	01	20
4	Ventricular tachycardia	03	10	02	66.66
5	BiFascicular block	01	03	0	
6	RBBB	01	03	01	100
7	LBBB	01	03	0	
8	Complete heart block	03	10	02	66.66

VPC's are the most common (43.33%) arrhythmia in anterior wall infarction, next is atrial fibrillation (17%).

TABLE – 6
THE TABLE SHOWING THE INCIDENCE OF VARIOUS ARRHYTHMIAS IN INFERIOR WALL MYOCARDIAL INFARCTION IN ICCU

SR. NO.	TYPES OF ARRHYTHMIA	NO. OF CASES	PERCENTAGE	NO. OF DEAT	PERCENTAGE
1	Ventricular premature contractions	03	18	0	0
2	Atrial premature beat	01	05	0	0
3	Atrial fibrillation	02	12	0	0
4	Ventricular tachycardia	02	12	0	0
5	Second degree A-V block type 1	01	05	0	0
6	Second degree A-V block type 2	03	18	02	66.66
7	First degree A-V Block	02	12	0	0
8	LBBB	01	05	01	100
9	Complete heart block	02	12	01	50

Most common arrhythmia in inferior wall infarction are second degree A-V block type 2 (18%), Ventricular premature contractions (18%) followed by first degree A-V block.

TABLE – 7
THE TABLE SHOWING THE INCIDENCE OF ARRHYTHMIAS IN COMBINED ANTERIOR AND INFERIOR INFARCTION.

SR. NO.	TYPES OF ARRHYTHMIA	NO. OF CASES	NO. OF DEATH	PERCENTAGE
1	Ventricular tachycardia	01	01	100%
2	Ventricular fibrillation	01	01	100%

One cases of ventricular fibrillation and one case ventricular tachycardia are reported with combined anterior and inferior wall & mortality is 100%.

TABLE – 8
THE TABLE SHOWING INCIDENCE OF MORTALITY IN RELATION TO LOCATION INFARCTION

SR. NO.	LOCATION	MORTALITY	PERCENTAGE
1	Anterior wall	06 out of 30	20
2	Inferior wall	04 out of 18	22
3	Anterior + Inferior wall	02 out of 02	100

The table shows higher mortality observed in combined anterior and inferior wall infarction as compared to anterior or inferior infarction.

Discussion:

The incidence of arrhythmia after Acute MI is common after the onset of symptoms. The mechanism responsible for infarction related arrhythmia include autonomic nervous system imbalance, electrolyte disturbance, ischemia, and slowed conduction in zones of ischemic myocardium [8]. An arrhythmia can be managed successfully if trained personnel and appropriate environment with equipment are available. Since most death from arrhythmia occur during the first few hours after infarction, the effectiveness of treatment relates directly to speed with which patients come under medical observation. The prompt management of arrhythmia constitutes a significant advances in the treatment of Acute MI.

Among study maximum incidence is in sixth decade. The youngest patient was 28 year old, while the oldest was 75 year old. So acute myocardial infarction with arrhythmia was more common during the sixth decade, which is consistent with other studies [1,2,3]. The increased incidence of myocardial infarction seen in fifth and sixth decade was probably due to increased prevalence of atherosclerosis

and CAD in this decade. As the age increases, the vessels become stiffer, causing rise in systolic blood pressure and left ventricular hypertrophy, which is an independent risk factor for IHD.

In present study the incidence in male and female ratio is 4.55: 1,similar results are seen in mohit shah study in which male are 70% and female 30 [3]. 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 HDL. After menopause the risk of coronary artery disease increases in women to reach equal to that of men.

Arrhythmia are more commonly seen in anterior wall infarction (60%) than inferior wall infarction (36%).

Ventricular premature contraction followed by atrial fibrillation are most common arrhythmia observed in this study, similar results are observed in Marangmei L, Singh SK study and also mohit shah study [1,3] .VPCs are more frequently documented in anterior infarction 43.33% as compared to 18% in inferior infarction.

Ventricular premature beats (43.33%) followed by atrial fibrillation (17%), atrial premature beat(10%) are in decreasing order with anterior infarction While 2nd degree A-V block type 2 (18%), 1st degree A-V block (12%), are in decreasing order with inferior wall infarction.

Study done by newby KH and et all [16] shows that, despite use of thrombolytic therapy, both early and late occurrence of sustained VT or VF continue to have negative impact on patients outcome and associated with higher mortality. In present study ventricular tachycardia and ventricular fibrillation occur in 10% and 2% of patients, and associated with 60% and 100% mortality, respectively.

In present study atrial fibrillation are seen in 14% of patients while atrial premature beat are seen in 8% of patients. Similarly, SPRINT study group [14], observes that atrial fibrillation seen in up to 15% of patients with myocardial infarction, most commonly in those who have significant left ventricular dysfunction.

One cases of ventricular fibrillation and one case ventricular tachycardia are reported with combined anterior and inferior wall infarction & associated with 100% mortality. Higher mortality observed in combined anterior and inferior wall infarction (100%) as compared to anterior (20%) or inferior infarction (22%).

Conclusions:

Thus our study observes that arrhythmia are more common in male than female & are most commonly in old age(sixth decade).Ventricular premature contractions is most common arrhythmia observed. Conduction block are common with inferior infarction. Arrhythmia with combined anterior and inferior infarction carries bad prognosis.

References:

1 Marangmei L, Singh SK, Devi KB, Raut SS, Chongtham DS, Singh KB. Profile of cardiac arrhythmia in acute myocardial infarction patients within 48 hours of admission: A hospital based study at RIMS Imphal. J Med Soc 2014;28:175-9

2 Nagabhushana S, Ranjith kumar GK, Ranganatha M, Virupakshappa. Study of Arrhythmias in Acute Myocardial Infarction. Int J Med Res Rev 2015;3(7):682-690. doi: 10.17511/ijmrr.2015.i7.126.

3 mohit j shah , nikita bhatt et all. A study of 100 cases of arrhythmia in first week of AMI in Gujarat 10.7860/JCDR/2014/6658.3769

4 CAMPBELL R.W, MURRY A., JULIAN D. G. Ventricular arrhythmias in first 12 hours of Acute Myocardial infarction Natural History study. British Heart Journal 1981 Oct; 46(4): 351–357

5 Thygesen K , Alpert JS, Jaffe AS et all third universal definition of myocardial infarction European heart journal 2012 Oct;33(20):2551-67.

6 Julia vogler , Gunter breithardt , lars Eckadrt bradyarryhthmia and conduction block Rev Esp Cardiol .2012;65:656-67 – vol 65

7 P.Yadav et al. clinical profile & risk factors in acute coronary syndrome. National Journal of Community Medicine. 2010; 1(2):150-152. 11. Siwach S.B. et al. Profile of young acute myocardial

8 HARRISON'S PRINCIPAL OF INTERNAL MEDICINE 19th edition chap 295 STEMI; 1608-1609

9 PS singh et all, clinical profile and risk factors in acute coronary syndrome. JIACM 2013; 14(2): 130-2

10 BERGER P.B., RUOCCO N.A Jr, RYAN TJ. ET AL, Incidence and prognostic implication of heart block complicating inferior wall myocardial infarction, treated with thrombolytic therapy. Results from TIMI II. Journal of American College of Cardiology .1992 Sep; 20(3):533-40

11 Lie KI, Wellens HJ, Downar E, Durrer D. Observations on patients with primary ventricular fibrillation complicating acute myocardial infarction. Circulation. 1975 Nov;52(5):755–759.

12 FREQUENCY OF COMPLETE HEART BLOCK IN ACUTE INFERIOR WALL MYOCARDIAL INFARCTION AND ITS RELATION WITH SEVERE OBSTRUCTIVE DISEASE OF THE INFARCT RELATED ARTERY Original Article Arooj Zahida , Ahmad Masood Akbara*, Abdul Rehman Abida , Muhammad Atif Imrana (J Cardiovasc Dis 2012;10(4):114-117)

13 Go AS, Barron HV, Rundle AC, Ornato JP, Avins AL. Bundle-branch block and in-hospital mortality in acute myocardial infarction. National Registry of Myocardial Infarction 2 Investigators. Ann Intern Med. 1998 Nov 1;129(9):690-7.

14 Behar S, Zahavi Z, Goldbourt U, Reicher-Reiss H. Long-term prognosis of patients with paroxysmal atrial fibrillation complicating acute myocardial infarction. SPRINT Study Group. Eur Heart J. 1992 Jan;13(1):45-50.

15 Feigl D, Ashkenazy J, Kishon Y. Early and late atrioventricular block in acute inferior myocardial infarction. J Am Coll Cardiol. 1984 Jul;4(1):35-8.

16 Newby KH, Thompson T, Stebbins A, Topol EJ, Califf RM, Natale A. Sustained ventricular arrhythmias in patients receiving thrombolytic therapy: incidence and outcomes. The GUSTO Investigators. Circulation. 1998 Dec 8;98(23):2567-73.

17 Jurkovicová O, Cagán S. [Reperfusion arrhythmias]. Bratisl Lek Listy. 1998 Mar-Apr;99(3-4):162-71. Review. Slovak.

18 Ghuran AV, Camm AJ. Ischaemic heart disease presenting as arrhythmias. Br Med Bull. 2001; 59:193-210. Review.

19 Goldberg RJ, Zevallos JC, Yarzebski J, Alpert JS, Gore JM, Chen Z, Dalen JE. Prognosis of acute myocardial infarction complicated by complete heart block (the Worcester Heart Attack Study). Am J Cardiol. 1992 May 1;69(14):1135-41.