# Outcome of Ischemic Heart Disease in the Intensive Care Unit in a Tertiary Care Hospital

**Poonam V Sancheti[1], Suresh K Mangulikar[2]**

**Author's Affiliation:**
[1]Asst prof , Dept. of Community Medicine, Government Medical College, Miraj; [2]Prof & Head of Dept, Community Medicine Department, Dr. V M Government Medical College, Solapur

**Correspondence**
Dr. Sancheti Poonam Vijay
poonamsancheti1120@gmail.com

## ABSTRACT

**Introduction:** Non communicable diseases are growing causes of mortality developing world. Objectives of the study were to study the socio-demographic profile of ischemic heart disease cases in ICU in the tertiary care hospital and to study the outcome of ischemic heart disease cases in ICU in the tertiary care hospital.

**Methods:** It was a hospital based descriptive study. Study was carried out in patients of IHD admitted in ICU of tertiary care hospital. The patients were informed about the examination. History was obtained from patients or relatives. Outcome was recorded. Appropriate Statistical analysis was used.

**Results:** Occurrence of disease was increasing as age advances. 66.92% patients were from urban and 33.08% were from rural areas. Maximum patients 72.77% were discharged after symptomatic relief. Highest deaths were in 70 years and above. Maximum deaths were noted in patients brought between 12 hours to 1 day. Highest deaths were seen in patients stayed for< 1 day, 84.62%.

**Conclusions:** Age, duration of hospital stay and duration between onset of symptoms and treatment are related to outcome of the patients with IHD. Association between the variables is studied in present study.

**Key Words**: Ischemic heart disease, outcome, sociodemographic profile, ICU

## INTRODUCTION

"Investment in prevention is the most sustainable solution for cardiovascular disease epidemic."[1]

Human health is shaped by demographic ageing, urbanization, and unhealthy lifestyles. Non-communicable diseases such as cardiovascular disease, diabetes and cancer have overtaken infectious diseases as leading causes of mortality.[2]Although cardiovascular diseases place significant economic burden on low- and middle-income countries, the resources available for its management in these countries are limited.[3] It is essential to recognize that burden of non-communicable diseases and failure to act immediately will result in large increases in avoidable CVD, placing serious pressures on the national economies.[3]

The changing relationship between social class and ischemic heart disease had increased its prevalence in lower socioeconomic class people and has its devastating complications of economy of developing countries like India. It would be more costly to search cases in community and confirm them on ECG, even it would require more manpower. Instead if the patients admitted in medicine are taken as study subjects, it would save unnecessary waste of logistics and physician's time as help of physician is taken to diagnose the case. As per admission criteria in the department, all cases suggestive of Ischemic heart disease are admitted in intensive care unit, present study was aimed at studying socio demographic profile and outcome of ischemic heart disease cases in the intensive care unit in the tertiary care hospital. The study is useful to find

locally prevalent risk factors and their relation to outcome in IHD patients in the study area.

## MATERIAL AND METHODS

The present study was carried out on the patients of ischemic heart disease admitted in Intensive care unit of tertiary care hospital attached to a government medical college.

It was a hospital based descriptive study. The period of study was from January 2014 to June 2015 i.e.18 months. Collection of data is done over a period of one year from 1st January 2014 to 31st December 2014.

All patients diagnosed as ischemic heart disease admitted in intensive care unit of a tertiary care centre in study period fulfilling inclusion criteria were included in the study.

**Inclusion Criteria:** Patients admitted in intensive care unit of a tertiary care centre diagnosed as ischemic heart disease by physician, over a period of one year from 1st January 2014 to 31st December 2014.Definite diagnosis of AMI was based on clinical examination, electrocardiogram (ECG), and cardiac enzymes.[4] Cases were confirmed by visiting participating hospitals on a daily or basis and by consulting physicians on duty. Investigations were done and interpreted by physician on duty.[5]

**Exclusion Criteria**: Patient who did not give consent for participation in the study.

Permission from the head of department of medicine was taken for the present study in intensive care unit. The patients were informed about the examination procedure and assured that they were free to refuse to get examined. Informed written consent was taken in local language from the patients before participation in the study. After informing the individuals, they were motivated to participate in the study. Separate proforma for each patient was filled. Identity of patients was not revealed. History was obtained from the patient and his/her relatives. The predesigned pretested proforma was used to collect information about epidemiological factors like age, sex, address, religion, education, occupation, marital status, type of family, socioeconomic status. The age of patients was entered on study proforma in completed years after confirmation by history sheet. Investigations like electrocardiogram (ECG) and cardiac biomarkers were interpreted by physician and were considered in the study. Outcome of patients during present admission and hospital stay of present admission were included in the study.Outcome of Ischemic heart disease patients admitted was recorded as died and survived.

**Died:** Patient died during the course of treatment for current episode of ischemic heart disease in a tertiary care centre was labelled as 'died'.

### Survived

**Discharged:** Patient who was relieved of symptoms for current admission and was relieved from a tertiary care centre by a treating doctor was labelled as discharged.

**Discharge against medical advice:** Patient who didn't complete treatment and left a tertiary care centre on own without permission of treating doctor was labelled as discharge against medical advice.

**Transferred to other hospital.**

Hospital stay of a patient was calculated as total number of days or hours the patient was admitted in tertiary care centre during the current episode of ischemic heart disease.

## RESULTS

The maximum numbers of patients were from age group 60-69 years i.e.119 (30.28%) followed by age group 70 years and above i.e. 103(26.21%) and minimum numbers of patients from age group 20-29 years (1.27%). There was no patient in age group of 12-20 years.

Occurrence of disease was increasing as age advances, as shown by linear trend test, which was statistically significant at $p < 0.05$. (Table 1)

Out of 393 patients, 263 (66.92%) patients were from urban area while 130 (33.08%) were residing in rural areas. Maximum patients in the study were Hindu by religion i.e. 318 (80.92%). Muslim patients were 72 (18.32%); patients of other religion were 0.76%. Maximum numbers of individuals were from joint family i.e. 178 (45.29%).

The present study results shown that, maximum 286 (72.77%) patients were discharged after symptomatic relief. Out of total, 68 (17.30%) patients died during this hospital stay, 37 (9.42%) patients took discharge against medical advice (DAMA).

**Table 1: Distribution of patients on the basis of age**

| Age in years | Males (%) | Females (%) | Total (%) |
|---|---|---|---|
| 20-29 | 4 (1.02) | 1 (0.25) | 5 (1.27) |
| 30-39 | 10 (2.54) | 8 (2.04) | 18 (4.58) |
| 40-49 | 29(7.38) | 19 (4.83) | 48 (12.21) |
| 50-59 | 64 (16.29) | 36 (9.16) | 100 (25.45) |
| 60-69 | 64 (16.28) | 55 (14.00) | 119 (30.28) |
| 70 and above | 47 (11.96) | 56 (14.25) | 103 (26.21) |
| **Total** | **218 (55.47)** | **175 (44.53)** | **393 (100)** |

[$x^2$ for linear trend = 5.75, d.f. = 1, $p < 0.05$; Significant]

**Table 2: Distribution of patients according to outcome**

| Treatment Outcome | Male (%) | Female (%) | Total (%) |
|---|---|---|---|
| Discharged | 158 (40.20) | 128 (32.57) | 286 (72.77) |
| Died | 34 (8.65) | 34 (8.65) | 68 (17.30) |
| Discharge against medical advice | 26 (6.62) | 11 (2.80) | 37 (9.42) |
| Transferred to other hospital | 0 | 2 (0.51) | 2 (0.51) |
| Total | 218 (55.47) | 175 (44.53) | 393 (100) |

[$x^2$ valuefor goodness of fit =500.57,d.f. =3, p< 0.001, highly significant]

**Table 3: Distribution of patients according to age and outcome**

| Indicators | Died (n=68)(%) | Survived (n=325)(%) | Total (n=393)(%) |
|---|---|---|---|
| **Age group** | | | |
| 20-29 | 0 (0) | 5 (1.5) | 5 (1.27) |
| 30-39 | 2 (2.9) | 16 (4.9) | 18 (4.58) |
| 40-49 | 5 (7.4) | 43 (13.2) | 48 (12.21) |
| 50-59 | 19 (27.9) | 81 (24.9) | 100 (25.45) |
| 60-69 | 20 (29.4) | 99 (30.5) | 119 (30.28) |
| 70 & above | 22 (32.4) | 81 (24.9) | 103 (26.21) |
| **Time period lapsed for admission and outcome** | | | |
| < 1 Hour | 0 (0) | 7 (2.2) | 7 (1.8) |
| 1 to 3 hours | 4 (5.9) | 17 (5.2) | 21 (5.3) |
| 3 to 6 hours | 27 (39.7) | 105 (32.3) | 132 (33.6) |
| 6 to 12 hrs | 9 (13.2) | 75 (23.1) | 82 (20.9) |
| 12 hr to 1 day | 9 (13.2) | 22 (6.8) | 31 (7.9) |
| >1 day | 19 (27.9) | 99 (30.5) | 118 (30) |
| **Hospital stay*** | | | |
| < 1 day | 33 (48.5) | 6 (1.8) | 39 (9.9) |
| 1-3 day | 18 (26.5) | 34 (10.5) | 52 (13.2) |
| 3-5 day | 8 (11.8) | 86 (26.5) | 94 (23.9) |
| ≥5 day | 9 (13.2) | 199 (61.2) | 208 (52.9) |

[$x^2$ for association =163, df 3, p< 0.0001, highly significant]

Maximum number of patients 286 (72.77%) were discharge dafter symptomatic relief, which was statistically significant at p<0.001. (Table 2)

Age wise distribution of deaths in ischemic heart disease patients showed that, out of total 393 patients, 68 died during present admission. Out of 68 (100%), highest (32.35%) deaths were observed in age-group of 70 years and above. Deaths in age group of 50-59 years were 27.94. No patient in age group of 20-29 years died during this admission.(Table 3)

Maximum numbers of patients i.e. 132 (33.59%) were brought to tertiary care centre within 3- 6 hours. None of the patients brought within one hour died. Maximum percentage of deaths was noted in patients who were brought between 12 hours to 1 day. (Table 4)

Distribution of patients according to hospital stay and outcome of disease shows highly statistically

significant association at p<0.001. In this the highest deaths were seen in patients stayed for < 1 day i.e. 84.62%. Maximum number of patients survived who were admitted for ≥5 days in hospital i. e. 95.67% which was statistically significant at p <0.0001.(Table 5)

## DISCUSSION

The age and sex wise distribution of study subjects has shown that, proportion of male patients was more than female patients, in present study, which was statistically significant. Similar distribution of males and females amongst study subjects was observed in a retrospective cross-sectional descriptive studycarried out by ShahadatH et al [2013][6]i.e. males 53.2% and female 46.85%.The present study results showed that occurrence of disease was increasing as age advances, as shown by linear trend test, which was statistically significant at p< 0.05. The mean age of presentation in present study was 59.70 ±12.70 years. In a study carried out by James C [2012][7]in a tertiary cardiac centre in Kerala, males were 62% were and females were 38%, 3.8% patients were under the age of 35 years and maximum 34.4% patients were in the age group 55-64 years followed by the age group 45-54years i.e. 28%. The distribution was comparable to the present study. In a case-control study carried out by Zodpey et al [2013][8] on Risk Factors for Acute Myocardial Infarction in Central India, maximum 82 (30.94%) study participants were from age group 61-70years, and minimum i.e. 5(1.89%) were having age less than 30 years which is similar to present study. In the retrospective study of patients of IHD admitted to the ICU carried out by Abraham SB et al [2010][9]27.9% patients were above the age of 70 years while 66.3% patients were between the ages of 40 and 60 years showing that middle-aged persons were more affected by acute coronary syndrome. In a study carried out by Gupta S et al [2012], [10] the mean age of presentation was 58.32±11.24 years, which is similar to present study. In a study on risk factors of cardiovascular diseases in an urban health centre of Kolkata carried out by Deb S, Dasgupta [2008],[11] study population comprised of an equal number of males and females, 123 each. Most of the males (17%), were between the ages of 40 and 49 years while the maximum number of female (19%) were aged 60 years old and above. Overall, 75 (30%) patients belonged to the geriatric age group (≥60 years age).In comparison to present study the average age in other studies such as BLITZ (67.0±12.5)[12], ENACT (64.5)[13], PRAIS-UK (66±12)[14] and Euro heart survey (EHS)[15] (64.6±12.5) were higher. Average age of onset of disease is less in Indian population than in western popula-

tion.Increasing age and male sex have been identified as important risk factors in other studies also.[16]

Distribution of patients according to area of residence has shown that proportion of patients residing at urban areas 263(66.92%) was more than those residing in rural areas, 130(33.08%), which was statistically significant at p< 0.01. A community based cross sectional study carried out by Joshi P et al [2010][17]showed that the prevalence of coronary heart disease in rural area (3.8%) was less than prevalence in urban area (8.8%) with significant difference (p<0.01).Similar distribution found in present study due to similar distribution of risk factors.

Distribution of patients according to hospital stay and outcome shows highly statistically significant association at p<0.0001. In this the highest mortality was seen in patients stayed for < 1 day i.e.84.62%. Maximum number of patients survived who were admitted for ≥5 days in hospital i.e. 95.67% which was statistically significant at p <0.0001.The present study results showed that, 287(72.77%) patients were discharged after symptomatic relief, 68(17.30%) patients died during this hospital stay, 37(9.42%) patients took discharge against medical advice (DAMA) and 2 (0.51%) patients were referred to higher centre. Maximum numbers of ischemic heart disease patients brought to tertiary care centre were discharged after symptomatic relief, which was statistically significant at p<0.001. In a hospital based study carried out by Vaz FS et al [2009][18] in Goa, 21.86% patients died during the hospital stay and remaining 78.82% survived. The findings were similar to present study. Results may be due to similar availability of health resources and their accessibility at places.

Present study results shown that, highest (32.35%) deaths were observed in age-group of 70 years and above, followed by age group of 60-69 years i.e. 29.41%. Deaths in age group of 50-59 years were 27.94%. Deaths in age group of 40-49 years were 7.36%. Deaths in age group of 30-39 years were 2.94%. No patient in age group of 20-29 years died during this admission. In a record based study carried out by Kakade SV et al [2006],[19] advancing age was the significant demographic characteristic (p<0.01) that increased the mortality due to AMI. The findings suggest more mortality as age advances.

Distribution of patients according to duration of hospital stay, maximum numbers of ischemic heart disease patients brought to tertiary care centre had hospital stay ≥5 days, which was statistically significant at p<0.001.In a hospital based study carried out by Vaz FS et al[2009][18] 79.44% patients stayed for more than four days,14.61% patients stayed for <2 days. Hospital stay of 5.92% study participants was in between 2-4 days. Similarly in a record based study carried out by Kakade SV et al [2006][19] in a teaching hospital of Western Maharashtra, 64.35% stayed for more than four days. Out of total, 27.19% patients stayed for < 2 days. Hospital stay of 8.45% study participants was in between 2-4 days. Findings were similar to present study. This may be due to similar admission and discharge criteria followed for ischemic heart disease patients.

Distribution of patients according to hospital stay and outcome of disease showed highly statistically significant association at p<0.001. In this the highest mortality was seen in patients stayed <1 day i.e. 84.62%. Maximum number of patients survived who were admitted for ≥5 days in hospital i.e. 95.67%.In a hospital based study carried out by Vaz FS et al[2009][18] in Goa highest mortality was seen in patients stayed < 1 day i.e.85.1%. Maximum number of patients survived who were admitted for ≥4 days in hospital i.e. 95.8%.Also in a record based study carried out by Kakade SV et al [2006],[19] results shown that the increased period of stay in hospital for Medicare increased survival significantly (p<0.001). The similar study findings showed that mortality in ischemic heart disease patients was highest on first day of admission including present study.

## CONCLUSION

In present hospital based study on ischemic heart disease patients in intensive care unit, maximum numbers of patients were from age group 60-69 years. Maximum patients brought to tertiary care centre were discharged after symptomatic relief. Highest mortality was seen in the patients who stayed for <1 day. Maximum number of patients who were admitted for ≥5 days, survived.Highest deaths were seen in age-group of 70 years and above.

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