PATTERN AND OUTCOME OF ISCHEMIC HEART DISEASE IN PATIENTS ADMITTED TO JIMMA UNIVERSITY SPECIALIZED HOSPITAL, SOUTHWEST ETHIOPIA

By: Dr. Motuma Bekele

E-mail: firo16@gmail.com

A RESEARCH PAPER TO BE SUBMITTED TO JIMMA UNIVERSITY, COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCES, DEPARTMENT OF INTERNAL MEDICINE FOR PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR SPECIALTY IN INTERNAL MEDICINE

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E-mail: firo16@gmail.com

ADIVISORS:

1. **Dr, MOHAMED A/MECHA(MD,internist)**
2. **MR ABDULHALIK WORKICHO(MPH, epidemiologist)**

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ABSTRACT

Background: Ischemic heart disease is the burgeoning problem in the world in US in 2010 affected 17.6million persons and worldwide the number one cause of death. Cardiovascular disease is one of the top ten causes of death in Ethiopia, and ischemic heart disease is increasing in incidence. The commonest traditional risk factors are family history of CVDs, cigarette smoking, diabetes mellitus, hypertension and dyslipidemia with obesity and also other nontraditional risk factors. The commonest presentation of the patients being acute coronary syndromes one of (STEMI, NSTEMI or unstable angina) and some patients with prior MI can present as ischemic heart failure. The severity of the ischemia is the best predictor of in hospital mortality and prognosis of the patient in the long run.

Objective: The objective of this study is to assess the commonest risk factors, the leading presenting feature and to determine the outcome of IHD patients admitted to JUSH medical wards during the study period.

Methods: A prospective hospital based cohort study was conducted for consecutive patients admitted to medical wards with diagnosis of IHD between October, 2014 to August, 2015. Total of 80 samples were collected over the study period. The data was organized, coded, entered, cleaned, and analyzed using SPSS version 20.0. Descriptive statistics and binary logistic regression analysis were done.

Results: Data collected from 80 IHD patients were included in the analysis. Forty nine (61.2%) of them were males. The mean age of the study subjects was 59.47+/- 11.75. Forty (50%) of them were in the age group of above 60 years and eleven (13.75%) are below 45years. Sixty (75%) of them were married. Majority of (26)32.5% of the respondents were farmers. Of the total 80 subjects in the study admitted with the diagnosis of ischemic heart disease 49(61.25%), 18(22.5%) and 13(16.25%) are diagnosed with chronic ischemic heart disease, Non ST elevation myocardial infarction/unstable angina and ST elevated myocardial infarction respectively. Of the admitted patients 38.75% have systolic hypertension and 35% have diastolic hypertension. Patients present with chest pain in 47.5% of cases and most of them (85%) present with class IV heart failure. Of the admitted patients thirteen (16.3%) died in the hospital out of which majority 41.67% are due to chronic ischemic heart disease.

Conclusion and recommendation: based upon this study the leading risk factor for ischemic heart disease is diabetes mellitus, so adequate treatment of diabetic patients can decrease number of patients. In patients with ischemic heart disease intensive control of risk factors will improve outcome of patients.

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First and foremost I would like to extend my deepest gratitude to Almighty GOD for keeping me safe

Next to omnipotent God I I would like to show my heartfelt thanks to my advisors Dr Mohammed Mecha (Internist) and Mr Abdulhaik Worikicho (MPH, epidemiologist) for giving me this chance to conduct this study and for tremendous support.

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AM GREATFUL!!!

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List of abbreviations

ACS; acute coronary syndrome

AHA; American heart association

ACC; American college of cardiology

CHD; coronary heart disease

CHF; Congestive Heart Failure

CVD; cardiovascular disease

DALY; daily activity…..

ECG; electrocardiography

ESC; European society of cardiology

HDL; high density lipoprotein

IHD; ischemic heart disease

HF; heart failure

JUSH; jimma university specialized hospital

LDL; low density lipoprotein

LMIC; low- and middle-income countries

LVEF: left ventricular ejection fraction

MI; myocardial infarction

MICU; medical intensive care unit

NCD; noncomunicable disease

NHANES; National Health and Nutrition Examination Survey

NYHA; New York heart association

NSTEMI; non ST elevated myocardial infarction

PCI; percutaneous coronary intervention

SSA; sub-Saharan Africa

STEMI; ST elevated myocardial infarction

UA; unstable angina

US; united states

CHAPTER ONE

1. INTRODUCTION

1.1 Back ground

Ischemic heart disease (IHD) is a condition in which there is an inadequate supply of blood and oxygen to a portion of the myocardium; it typically occurs when there is an imbalance between myocardial oxygen supply and demand **[1]**

The 2010 Heart Disease and Stroke Statistics update of the American Heart Association reported that 17.6 million persons in the United States have CHD, including 8.5 million with MI and 10.2 million with angina pectoris. The reported prevalence increases with age for both women and men. **(2)** For persons aged 40 years, the lifetime risk of developing CHD is 49 percent in men and 32 percent in women. For those reaching age 70 years, the lifetime risk is 35 percent in men and 24 percent in women**.**

Ischemic heart disease is the number one cause of death in adults from both low- and middle income countries as well as from high-income countries. At the turn of the century, it was reported that coronary heart disease mortality was expected to increase approximately 29 percent in women and 48 percent in men in developed countries between 1990 and 2020. The corresponding estimated increases in developing countries were 120 percent in women and 137 percent in men(3).

Many risk factors for cardiovascular disease are modifiable by specific preventive measures. In the worldwide INTERHEART study of patients from 52 countries, nine potentially modifiable factors accounted for over 90 percent of the population-attributable risk of a first MI: smoking, dyslipidemia, hypertension, diabetes, abdominal obesity, psychosocial factors, daily consumption of fruits and vegetables, regular alcohol consumption, and regular physical activity Family history is a significant independent risk factor for CHD, particularly among younger individuals with a family history of premature disease(4,5,6).

IHD causes more deaths and disability and incurs greater economic costs than any other illness in the developed world. IHD is the most common, serious, chronic, life-threatening illness in the United States, where 13 million persons have IHD, >6 million have angina pectoris, and >7 million have sustained a myocardial infarction. patients with IHD have different types of presentation with acute coronary syndrome the commonest of all presenting as either of UA/NSTEMI or STEMI others present with sudden cardiac death and Patients with IHD also can present with cardiomegaly and heart failure secondary to ischemic damage of the left ventricular myocardium that may have caused no symptoms before the development of heart failure(**7)** The presentation pattern affects 1-year mortality in patients with ACS, with unadjusted mortality being highest in patients with STEMI and lowest in patients with unstable angina**.[8]**

The clinical presentation of patients with ACS is typical chest pain or equivalents and some patients like elderly and diabetic also present with silent chest pain. LV dysfunction, wall motion

abnormalities and mitral regurgitation were more common in IHD cases with previous heart attack. The diagnostic modalities for IHD are by doing cardiac biomarkers, ECG, echocardiography and other baseline investigations. There are three types of ACS: ST elevation (formerly Q-wave) MI (STEMI), non-ST elevation (formerly non-Q wave) MI (NSTEMI), and unstable angina (UA). The first two are characterized by a typical rise and/or fall in biomarkers of myocyte injury. (**9)**

Patients with documented UA/NSTEMI exhibit a wide spectrum of early (30 days) risk of death, ranging from 1 to 10%, and of new or recurrent infarction of 3–5% or recurrent ACS (5-15%) **(10).** However in-hospital mortality was low in unstable angina (0.8%), being much higher in NSTEMI patients (6.6%), ($p<0.001$). **(10].** The in-hospital or 30-day mortality rates have been lowest in clinical trials in which patients were carefully selected and therapy carefully monitored. Among patients with an STEMI, approximate in-hospital or 30-day mortality rates were 13 percent with medical therapy alone, 6 to 7 percent with optimal fibrinolytic therapy, and as low as 3 to 5 percent with primary PCI when performed within two hours of hospital arrival. **(11)** The prognosis of patients with chronic IHD presenting with heart failure have prognosis equivalent with other types of heart failure patients.

1.2 Statement of the Problem

According to the new report from World Health Organization (WHO) published in September 2011, cardiovascular diseases (CVDs) remain the leading cause of death and disability in the world. Non-communicable diseases (NCD) accounted for more than 36 million deaths globally in 2008 and CVDs were responsible for 17.3 million (48%) of all NCDs deaths, an estimated 7.3 million (42%) were due to ischemic heart disease, and an additional 2.2 million are due to hypertensive disease and/or CHF. Over 80% of CVD deaths occur in low- and middle-income countries (LMIC). Although, a large proportion of CVDs is preventable, they continue to rise mainly because preventive measures are inadequate and it has been projected that by year 2030, almost 23.6 million people will die from CVDs mainly from heart disease and are projected to remain the single leading cause of death globally. Similarly, majority of CVD deaths in low income countries occur in individuals less than 60 years of age. These premature deaths have grave economic and social implications **[12].**

In the North Africa/Middle East and South Asia regions-regions with high IHD burden-more than 29% of males and 24% of females struck by IHD were <50 years old. Age-standardized IHD DALYs decreased in most countries between 1990 and 2010, but increased in a number of countries in the Eastern Europe/Central Asia region (>1,000 per 100,000 increase) and South Asia region (>175 per 100,000). (**13, 14)**

Ischemic heart disease (IHD), previously considered rare in sub-Saharan Africa, now ranks 8th among the leading causes of death in men and women in the region. Furthermore, the prevalence of IHD and related morbidity may be increasing as a result of adverse behavioural and lifestyle changes associated with urbanisation and the epidemiological transition. The major risk factors for IHD in sub-Saharan Africa include hypertension, smoking, diabetes, abdominal obesity and dyslipidaemia. (**15)** Smoking is the major risk factor in young sub-Saharan Africans with ACS. (**16**)

The prevalence of IHD in Africa context is on rise with varying rates of progression in different countries, but it lacks comprehensive datas in africa, Wade found a prevalence of 0.03% and an incidence of 5.7%(**17**) and on recent studies incidence is about 6.8% bringing our numbers in the range of the European and American literature (4-10%) and could be an evidence of a real epidemiological transition (**18,19**)

The morbidity and mortality associated with IHD is enormous worldwide with many possible causes of death at presentation, while on treatment in the hospital and after discharge. Even if the mortality associated with IHD is decreasing in developed country in the past two decades the morbidity and mortality in developing countries is increasing due to westernization, poor management availability, poor patient care because most of developing countries policy is on communicable diseases and less patient awareness about IHD.

There are a number of causes of death in the early (initial 30 days) post-MI period in patients who have recently had a MI, including cardiogenic shock, sudden cardiac death, progressive heart failure, mechanical cardiac complications, and repeat MI. In-hospital death rates following MI have fallen substantially in the past few decades with the increasing use of reperfusion techniques, which often limit the amount of permanent myocardial damage, necrosis, and scar tissue formation. In a report that evaluated the interval 1987 to 2002, the 28 day case fatality fell from 5.3 to 3.8 percent. (**20**) A similar trend was noted in an analysis of data on 2.5 million patients from the National Registry of Myocardial Infarction (NRMI). In-hospital mortality after an acute MI declined from 10.4 percent in 1994 to 6.3 percent in 2006. (**21, 22)**

In Ethiopia the disease burden is not clearly studied but with little data CVD is considered one of the top ten causes of morbidity and mortality, in one study done in tikur anbessa hospital it shows AMI is the 3rd cause of admission to ICU and the study shows the increase in incidence of myocardial infarction in Ethiopian setup(**23**).

1.3. Significance of the Study

To our knowledge, this will be the first study to be done ischemic heart disease burden associated risk factors in JUSH and all over the country. As per the current Ethiopian health policy, prevention and treatment of non-communicable disease is becoming the core agenda and cardiovascular disease especially IHD is becoming rampant in incidence. So this study will help the policy makers, the treating health professionals and non-governmental organizations on what they should focus to prevent the epidemics of this non communicable disease.

This study will be a very good entry point for IHD research, recognition and identification of the leading risk factors in our setup and also help us to know where we are on the care of hospitalized patients with this problem.

CHAPTER TWO

2.1 Literature review

Most of the studies done about IHD; risk factors, patterns and disease inhospital outcome is done in developed countries with only few literatures are found in developing countries including our country. Even if the incidence of myocardial infarction is very different in different populations all over the world the risk factors are almost universal. On the patterns of presentation most of the studies done focus on patterns of ACS ONLY not on patients presented with ischemic heart failure (**1,4, 8**,**20, 22)**

An analysis from the National Health and Nutrition Examination Survey (NHANES) I Epidemiologic Follow-up study compared two cohorts of subjects, from 1971 to 1982 (10,869 patients) and from 1982 to 1992 (9774 patients) [**24**]. The incidence of CHD decreased from 133 to 114 cases per 10,000 persons per year of follow-up. An even larger decline was seen in cardiovascular disease overall (from 294 to 225 cases per 10,000 persons per year)

The Global Registry of Acute Coronary Events (GRACE) describes the epidemiology, management, and outcomes of patients with ACS. Data were collected from 11,543 patients enrolled in 14 countries. Of these patients, 30% had ST-segment elevation myocardial infarction (STEMI), 25% had non-ST-segment elevation myocardial infarction (NSTEMI), 38% had unstable angina pectoris, and 7% had other cardiac or noncardiac diagnoses. Hospital case fatality rates were markedly different among patients with STEMI, NSTEMI, and unstable angina (7%, 6%, and 3%, respectively; STEMI vs NSTEMI, $p = 0.0459$, and for either group vs unstable angina, $p < 0.001$)[**2**].

A registry involving all 7 general hospitals in Kuwait was set up. Consecutive patients diagnosed as having ACS over a period of 6 months were enrolled, Of 2,129 patients enrolled, 718 (34%) had ST segment elevation myocardial infarction (STEMI), 576 (27%) non-ST segment elevation myocardial infarction (NSTEMI) and 835 (39%) unstable angina (UA). Thrombolytic therapy was used in 556 (77%) patients with STEMI. Almost all patients with ACS (2,050, 96%) received aspirin during hospitalization. Only a minority received clopidogrel, 18 (3%) STEMI, 36 (6%) NSTEMI and 96 (12%) UA patients. In-hospital mortality occurred in 31 (4%) myocardial infarction patients and 4 (0.5%) UA patients ($p < 0.0001$. [**3**]

In another study done to assess the relationship between presentation pattern and mortality in patients with acute coronary syndrome (ACS) undergoing percutaneous coronary intervention in Deutsches Herzzentrum, Technische Universitat, Lazarettstrasse 36, Munich, Germany, At 1 year there were 976 deaths, 390 (13.7%) among STEMI patients, 366 (12.0%) among NSTEMI patients and 220 (4.8%) among patients with unstable angina (OR = 1.17, 95% CI 1.01-1.35 for

STEMI vs. NSTEMI; OR = 3.00, 95% CI 2.56-3.51 for STEMI vs. unstable angina, and OR = 2.58, 95% CI 2.20-3.04 for NSTEMI vs. unstable angina). In the Cox proportional hazards model ACS form was an independent correlate of 1-year mortality (HR = 0.90, 95% CI 0.73-1.13 for STEMI vs. NSTEMI; HR = 1.56, 95% CI 1.13-2.14 for STEMI vs. unstable angina; HR = 1.72, 95% CI 1.30-2.29 for NSTEMI vs. unstable angina).[**25**]

A multicenter study was done on Trends in presenting characteristics and hospital mortality among patients with ST elevation and non-ST elevation myocardial infarction From 1990 to 2006 in US Hospitals, the proportion of NSTEMI increased from 14.2% to 59.1% (P < .0001), whereas the proportion of STEMI decreased. Mean age increased (from 64.1 to 66.4 years, P < . 0001) as did the proportion of females (from 32.4% to 37.0%, P < .0001). Patients were less likely to report prior angina, prior MI, or family history of coronary artery disease but more likely to report history of diabetes, hypertension, current smoking, heart failure, prior revascularization, stroke, and hyperlipidemia. From 1994 to 2006, hospital mortality fell among all patients (10.4% to 6.3%), STEMI (11.5% to 8.0%), and NSTEMI (7.1% to 5.2%), (all P < . 0001). After adjustment for baseline covariates, hospital mortality fell among all patients by 23.6% (odds ratio [OR] 0.764, 95% CI 0.744-0.785), STEMI by 24.2% (OR 0.758, 0.732-0.784), and NSTEMI by 22.6% (OR 0.774, 0.741-0.809), all P < .001.[**21**]

Although IHD in SSA remains relatively uncommon, its prevalence is predicted to rise in the next two decades due to the rising prevalence of risk factors, especially hypertension, diabetes, overweight and obesity, physical inactivity, increased tobacco use and dyslipidaemia. It is estimated that age-standardised mortality rates for IHD will rise by 27% in African men and 25% in women by 2015, and by 70 and 74%, respectively by 2030.[**4**]

On INTERHEART Africa study hypertension, smoking, diabetes, abdominal obesity and dyslipidemia, contributed a population-attributable risk of nearly 90% for acute myocardial infarction [**7**].

A prospective multicenter study done at the different departments of cardiology in Dakar. Hospital prevalence of acute coronary syndrome in young patients was 0.45% (21/4627), meaning 6.8% (21/309) of patients admitted for acute coronary syndrome during the same period. Eighteen patients (85.7%) were males and three patients (14.3%) were females, giving a ratio of 6:1. The mean age of patients was 34 ± 1.9 years with a range of 24 and 40 years. In women, the mean age was 37 years and among men it was 34 years. The risk factors in our patients were dominated by active smoking found in 11 patients (52.4%). The average number of pack-years was 8.10 ± 2.3 and ranged from 1 to 17 pack-years. Five patients (23.8%) had no risk factors, seven patients (33.3%) had one risk factor and the remaining patients (42.9%) had more than one. Diagnosis of ST- elevation myocardial infarction in 85.7% of patients and non-ST-elevation myocardial infarction in 14.3% was made by the combination electrocardiographic features and troponin assay.[**8**]

A study done on the changing pattern of cardiovascular diseases in Ethiopia; A total of 474 patients (216 males and 258 females) with cardiovascular diseases which were followed in the cardiac clinic of the Gondar College of Medical Science Hospital, Gondar, Ethiopia, between 1985 and 1988 were studied. The commonest form of heart disease in Ethiopians was found to be rheumatic heart disease (42%), and affects mostly young people, who often have advanced valvular lesions. The incidences of rheumatic and hypertensive heart diseases have shown a significant increase. However, the rise in the incidence of myocardial infarction over a 20 year period from 0.88 per 1000 in 1963-68 to 6.4 per 1000 in 1985-88 is distinctively impressive. [**9**]

Trends of acute myocardial infarction admissions over a decade; a case series analysis undertaken to evaluate the importance of acute myocardial infarction (AMI) as a cause of admission at the Tikur Anbessa medical intensive care unit (MICU) and the trend of that importance over a decade (1988-1997). In the decade under study 2313 patients were admitted to MICU according to its register. Overall AMI was the third commonest cause of admission and accounted for 8.8% (N = 203) of all MICU cases. AMI annual admissions increased consistently over the years. Of the 122 AMI admissions during the second half of the decade, 92 charts were available for detailed analysis. 86% (79/92) fulfilled the stated criteria for the diagnosis. The mean age of these patients was 55.1 +/- 13.0 years. Males constituted 82% of all AMI cases.[**23**]

On a five year review of myocardial infarction in tikur anbessa hospital, During a five-year period between September 1981 and August 1986, 23 patients with acute myocardial infarction (17 Ethiopians, 4 foreigners and 2 half-blooded Ethiopians) were admitted to the Tikur Anbessa Hospital in Addis Ababa, giving an incidence for myocardial infarction among medical admissions of 3.5 per thousand. The age range for Ethiopians was 31 to 71 years. Of the 17 Ethiopians, seven were below the age of 50 years and five died giving a mortality rate of 29.4%. The only female patient was of Ethiopian-Greek origin with multiple coronary risk factors. Cigarette smoking, hypertension, diabetes mellitus, hypercholesterolemia and obesity were among the risk factors identified among Ethiopians suffering from myocardial infarction. [**11**]

Another study on characteristics and management of patients with acute coronary syndrome at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia. Among a total of 21 patients, 16 (65.2%) were males. The mean age was 57.1 +/- 13.7 ranging from 33 to 80 years. All those patients had cardiac biomarkers and electrocardiography (ECG), 14 (66.7%) had echocardiography and only 2 (9.6%) patients had coronary angiography. Based on diagnostic result 13 (62%) patients had ST-elevation myocardial infarction (STEMI), 6 (28.6%) had non-ST elevation myocardial elevation (NSTEM) 1 and 2 (9.5%) had unstable angina. All were given anti-platelets and statin but none of them got thrombolytics. Three (14.4%) patients died after two weeks of hospitalization.[**15**]

Chapter Three: Objectives

3.1- General Objective

To assess the risk factors, pattern and discharge outcome of IHD in patients admitted in Jimma University Specialized Hospital, Southwest Ethiopia.

3.2 Specific objectives

1. To describe sociodemographic characteristics of IHD patients admitted to JUSH

2. To describe the commonest pattern of ACS in admitted patients to JUSH medical wards

3. To analysis the relation of the disease pattern with discharge outcome of ACS patients at JUSH

4. To determine the commonest risk factors of IHD in JUSH admitted patients

CHAPTER FOUR: METHODS

4.1 Study Setting

The study was conducted at Jimma University specialized hospital (JUSH), located in Jimma town in southwest of Ethiopia, in Oromia region, 350km southwest of capital, Addis Ababa.

Jimma zone comprises Jimma town and its nearby woredas with estimated population of 2,486,155. JUSH is the only referral teaching hospital in this largest region of the country. The hospital gives health service at inpatient and outpatient level as a referral Hospital with catchment area of 15 million populations in the South West of the country. The department of internal medicine has a total of 100 beds with about 2781 annual admission but there was no study that shows how many of them were admitted with the diagnosis of IHD. The service is rendered by internists, medical residents, general practitioners and medical interns.

The study was conducted from October 2014 through August /2015 for eleven months.

4.2 Study design

A prospective cohort hospital based survey was conducted in medical wards on patients admitted with IHD, JUSH.

4.3 Study participants

4.3.1 Source population

The source population were all adult patients (18 and above years of age) admitted to the medical wards of JUSH.

4.3.2 Study population

The study population were all adult patients (18 and above years of age) admitted to the medical wards of JUSH with a diagnosis of IHD will be included in the study according to the inclusion and exclusion criteria during the period of the study.

4.4 inclusion and exclusion criteria

4.4.1 Inclusion Criteria-

All adult patients who meet the diagnosis of ischemic heart disease with ECG or cardiac biomarkers or echocardiography during the study period and patients who agreed to participate in the study were included

4.4.2 Exclusion Criteria

Patients who are readmitted after once included in the study with stable IHD were excluded unless they develop ACS of new onset.

4.5 Sample size and sampling technique

4.5.1 The sample size

There are no studies describing the risk factors, patterns and outcome of ACS patients in JUSH. The sample is calculated using single population proportion taking the prevalence of IHD in

admitted patients to the medical wards to be p=50% (prevalence not known) , margin of error 5%, and using 95% confidence level.

The sample size is calculated using the formula

n= (Zα/2)2 P (1-P) / d2

P = 50% used as the expected proportion of any of the traditional risk factors among IHD patients admitted in the hospital

Zα/2 = standard normal variable at 95% confidence level (1.96).

d= precision (tolerable margin of error) = 0.05

Then, the final sample size will be

n = (1.96)2x 0.5(1-0.5)/ (.05)2 = 384 patients

From the admission/discharge record data, the total number of cardiac patients admitted to medical wards in the year of 2006 E.C was 140.

Since the source population is less than 10,000, applying a formula for finite population correction the final sample size was calculated as follows.

nf = n/{1+(n/N)}, where

nf is the final sample size

n=384

N=140 nf = 384/(1+384/140)=102 . The total sample size was 102. In this specific study convenience sampling was used.

4.5.2 Sampling technique

Convenient sampling technique was used for all patients consecutively admitted to medical wards with the diagnosis of IHD and who fulfill the inclusion criteria will be included in the study until the study period is completed

4.6 study Variables

The following variables were measured:

4.6.1 Dependent variable

- Outcome at discharge(alive or dead)

4.6.2 Independent variable

Demographic characteristics (age, sex)

Previous Medical history

Diabetes mellitus

Hypertension

Family history of cardiac illness

Smoking history (past and present)

Previous admission for cardiac illness

Admission profiles

Blood pressure

Abdominal circumference

LDL

HDL

Troponin level

Echocardiographic findings

ECG findings

CHF severity NYHA functional classification

Chest pain

4.7. Data Collection Process and Measurement

Data collection format containing individual patient characteristics will be prepared before the data collection time. Data collectors visit all medical wards every day and will go through all the patients' files to identify those newly admitted with diagnosis of ischemic heart disease. The patients who will be identified will then be assessed for inclusion into the study. A structured questionnaire was used and patient were interviewed to fill the data collection format with relevant information about patient socio-demographic characteristic, number of previous

admission, co morbidities including history of diabetes mellitus, hypertension, current or past smoking of cigarettes, family history of cardiac illness.

History was taken from the card on how the patient was presented to the hospital by asking the patient about history of chest pain, or other specific symptoms like shortness of breath, body swelling etc.

Other vital statics like heart rate, blood pressure, waist circumference was taken from the chart of the patient at the time of admission. And the laboratory results like lipid profile (HDL, LDL), FBS, EKG, echocardiography and cardiac biomarker results taken from the chart at the time of admission

4.8 Data collectors

Data collection was undertaken by total of three personnel one first year internal medicine resident and two BSC nurses after they are trained for one day about ischemic heart disease and outcome, objective of the study, variables on the questionnaire and its implication. Then, they were assigned to fill the data collection format. All data collection activities were supervised by trained medical residents and principal investigator after the diagnosis of IHD is made by the treating physician.

4.9 Data analysis, processing, and Interpretation

The data collected was first cleaned, edited and entered into a computer and analyzed using software programme SPSS-20.

The result was described as mean + standard deviation for normally distributed continuous variables and median. Categorical variables are expressed as frequencies and percentages.

4.10 Data quality assurance

To ensure data quality pre-testing of data collection tools was made. Adequate training was provided for data collectors, and the compilation format was prepared in simple English to maintain clarity and easier understanding by those data collectors. The collected data was checked for completeness and consistency on the day of collection by the principal investigator and any inconsistency, inaccuracy, or missing data implied will be returned for correction on same day. There was also demonstration and a practical session on interviewing and record

reviewing. The participants were given appropriate manuals and guidelines during the training. Onsite supervision will also be done by principal investigator.

4.11 Ethical consideration

Ethical clearance to conduct the study was obtained from the ethical Review Board of Jimma University, before official commencement of the data collection process. A letter of recommendation was obtained from the above responsible office to the head of each medical ward. Written informed consent should be obtained from all patients before data collection. Patient's confidentiality, equity of services and interests of patients was ensured during the study period. This study doesn't involve any potentially harmful intervention to the patient. All the patients are offered clinical care equally with other patients.

4.12 Dissemination plan

After research completion and finalizing the report, the findings of the study will be disseminated to all relevant stakeholders through presentation and publication. Copies of the research will be given to Jimma University, JUSH, from which data will be collected, to the department of Internal Medicine, to the ministry of health and Ethiopian Non-communicable diseases (NCDs) association, other concerned institutions, and stake holders and for possible intervention based on the findings.

4.13 Operational Definitions of terms in the study

Central obesity; is defined as a waist circumference of more than 94 cm in men and more than 80 cm in women**. [20]**

Ischemic heart disease; is a condition in which there is an inadequate supply of blood and oxygen to a portion of the myocardium; it typically occurs when there is an imbalance between myocardial oxygen supply and demand.

Ischemic heart failure; heart failure due to ischemic heart disease

STEMI; The joint ESC/ACCF/AHA/WHF committee for the definition of MI established specific ECG criteria for the diagnosis of ST elevation MI, which include 2 mm of ST segment elevation the precordial leads for men and 1.5 mm for women (who tend to have less ST elevation) and greater than 1mm in other leads.

NSTEMI; A non-ST elevation ACS is manifested by ST depressions and/or T wave inversions without ST segment elevations or pathologic Q waves.

Unstable angina; is considered to be present in patients with ischemic symptoms suggestive of an ACS without elevation in biomarkers with or without ECG changes indicative of ischemia.

In-hospital mortality was defined as (1) death from any cause, (2) death from cardiac causes including sudden cardiac death and HF death, and (3) death from cerebral or vascular causes.

Death was considered to be cardiac (defined as HF death, sudden death, or other cardiac death) unless a specific noncardiac cause was identified by each primary physician

NYHA classification

Class I: No limitations. Ordinary physical activity does not cause undue fatigue, dyspnea, or palpitations.

Class II: Slight limitation of physical activity. Such patients are comfortable at rest. Ordinary physical activity results in fatigue, palpitations, dyspnea, or angina.

Class III: Marked limitation of physical activity. Although patients are comfortable at rest, less-than-ordinary activity leads to fatigue, dyspnea, palpitations, or angina.

Class IV: Symptomatic at rest. Symptoms of CHF are present at rest; discomfort increases with any physical activity

<table>
<tr><td colspan="3">Framingham criteria for clinical diagnosis of Congestive Heart failure</td></tr>
<tr><td>Major criteria</td><td>Minor criteria</td><td>Major or Minor</td></tr>
<tr><td>Paroxysmal nocturnal dyspnea</td><td>Bilateral extremity edema</td><td rowspan="3">weight loss of ≥4.5 kg over 5 days in response to treatment</td></tr>
<tr><td>Jugular venous distention</td><td>Night cough</td></tr>
<tr><td>Rales</td><td>Dyspnea on exertion</td></tr>
<tr><td>Cardiomegaly</td><td>Hepatomegaly</td><td></td></tr>
<tr><td>Acute pulmonary edema</td><td>Pleural effusion</td><td></td></tr>
<tr><td>S3 gallop</td><td>Reduced vital capacity by one third from the maximal value recorded</td><td></td></tr>
<tr><td>Increased venous pressure (> 16 cm H_2O)</td><td>Tachycardia (rate of ≥120 bpm).</td><td></td></tr>
<tr><td>Positive hepatojugular reflux</td><td></td><td></td></tr>
<tr><td colspan="3">Criteria for diagnosis of CHF is two major or one major plus two minor criteria</td></tr>
</table>

Chapter 5: RESULTS

5.1 Socio-demographic characteristics of admitted patients

The study comprised of 80 patients with ischemic heart disease admitted to medical wards during the study period was included in the analysis making a response rate of 94.1%. Forty nine (61.2%) of them were males. The mean age of the study subjects was 59.47+/- 11.75. Forty (50%) of them were in the age group of above 60 years and eleven (13.75%) are below 45years. Sixty (75%) of them were married. (26)32.5%, 14(17.5%), 11(13.8%), 13(16.3%), 5(6.3%) and of the respondents were farmers, housewife, government employee, private business owners and nongovernment employs respectively. The majority of the patients (53.8%) were from rural areas. (Table 1).

Table 1: socio-demographic characteristics of admitted of ischemic heart disease patients admitted to JUSH medical wards from December 2014 to April 2015

Variable	Category	Frequency	Percentage
Age	<45	11	13.75
	45-60	39	48.75
	>60	30	37.5
Sex	Male	49	61.2
	Female	31	38.8
Marital status	Married	60	75.0
	Single	4	5.0
	Widowed	7	8.8
	Divorced	9	11.3
Occupation	Farmer	26	32.5
	Government employ	11	13.8
	House wife	14	17.5
	None	11	13.8
	Nongovernment employ	5	6.3
	Private business	13	16.3
Address	Urban	37	46.2
	Rural	43	53.8

5.2: Clinical Characteristics

Of the total 80 subjects in the study admitted with the diagnosis of ischemic heart disease 49(61.25%), 18(22.5%) and 13(16.25%) are diagnosed with chronic ischemic heart disease, non ST elevated myocardial infarction/unstable angina(NSTEMI/UA) and ST elevated myocardial infarction(STEMI) respectively. Of the admitted patients 38.75% have systolic hypertension and 35% have diastolic hypertension. Patients present with chest pain in 47.5% of cases and most of them (85%) present with class IV heart failure. 29.5% of admitted patients have blood glucose of diabetic range(>126mg/dl). Of the admitted patients 30% and 73.8% have elevated troponin level and positive echo finding of IHD respectively. Thirty seven (47.6%) had hypertension as a risk factor and twenty one (26.3%), 15(18.8%), 15(18.8%) and 23(34.3%) have diabetes mellitus, smoking, family history of coronary heart disease and elevated LDL as a risk factor. Eighteen (26.87%) of admitted patients out of sixty seven for whom HDL was done have HDL of less than 40mg/dl. Additionally nine (29%) of women and six (12.2%) male are obese based on abdominal circumference. Of the admitted patients thirteen (16.3%) died in the hospital out of which three (25%), four (33.33) and five (41.67) died with the diagnosis of STEMI, NSTEMI and chronic IHD respectively.

Table 2. Clinical characteristics and outcome of ischemic heart disease patients admitted to JUSH medical wards from December 2014 to April 2015.

Variable	Category		Frequency	Percentage
Admission BGL	<126		50	70.4
	>126		21	29.6
Admission SBP(mm Hg)	<140		49	61.25
	≥140		31	38.75
Admission DBP(mm Hg)	<90		52	65
	≥90		28	35
Risk factors	Hypertension		37	47.6
	Cigarette smoking		15	18.8
	Diabetes mellitus		21	26.3
	Family history of coronary heart disease		15	18.8
	Atrial fibrillation		17	21.3
	Abdominal circumferance	Male >102cm	6	12.2
		Female >88cm	9	29
Lipid profile	HDL <40mg/dl		18	26.87
	HDL>=40mg/dl		49	73.13
	LDL	<100mg/dl	44	65.7
		>100mg/dl	23	34.3
Chest pain	Present in		38	47.5
NYHA class of patients	Class 2		1	1.3
	Class 3		11	13.8
	Class 4		68	85.0
Troponin	Elevated in		24	30
Echocardiographic find of IHD	Positive finding		59	73.8
Pattern of IHD	Chronic IHD		49	61.25
	STEMI		13	16.25
	NSTEMI		18	22.5
Discharge outcome	Dead		12	15
	Alive		68	85

Table 3: the relation between pattern of IHD and discharge outcome of patients admitted to JUSH medical wards from December 2014 to April 2015.

		DISCHARGE OUTCOME		Total
		DIED	ALIVE	
pattern of ischemic heart disease	Chronic ischemic heart disease	5	44	49
	NSTEMI/UA	4	13	17

	STEMI	3	10	13
Total		12	68	80

CHAPTER 6: DISCUSSION

6.1 Discussion

In this study as the commonest risk factors for ischemic heart disease are hypertension and diabetes mellitus which is comparable with other studies in Africa (4, 21).

Most of the patients admitted with diagnosis of IHD are male (61.2%) and over the age of 45years (69%) with the mean age of 59.47+/- 11.75, which is comparable with almost all studies in different populations all over the world and the youngest patient diagnosed is 31years old patient.

Of the 80 admitted patients 38.75% and 35% patients have systolic and diastolic range blood pressure at admission and most patients have blood glucose level of less than 126mg/dl at admission.

Chest pain was the presenting symptom for about 47.5% of all IHD Patients admitted to the ward, and 85% patients are class 4 congestive heart failure and only 1.3% was class 2 but no class 1 patient admitted.

Of the admitted patients 73.8% patients have echocardiographic sign of ischemic heart disease from the current or previous echocardiography report documented

With respect to the pattern of ischemic heart disease admitted to the ward over the study period of six months chronic IHD is the commonest, separately when we see acute coronary syndrome NSTEMI/UA accounts 57% of cases where as STEMI is about 43% which is comparable with different studies.
The in-hospital mortality rates were, 30% and 23.5% respectivelty, which is much higher than the other African studies. The reason can be due to late hospital presentation, poor early management like absence of surgical intervention at early presentation or poor early diagnostic modality availability (3, 15).

Conclusion and recommendation

Based upon this study the leading risk factor for ischemic heart disease is diabetes mellitus, so adequate treatment of diabetic patients can decrease number of patients admitted with ischemic heart disease. Further study should be done on association of known risk factors and their effect on our patients in our context.

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ANNEX II CONSENT FORM

CONSENT FORM FOR STUDY PARTICIPANTS

Jimma University College of Public Health and Medical Sciences, Jimma University.

Questionnaire for assessing the prevalence of the risk factors, patterns and discharge outcome of IHD patients admitted to medical wards JUSH, Nov/2014-April/2015

A. Consent form In English

A) INFORMATION TO THE PARTICIPANT

Interview code no _____

Greeting and self-introduction and consent

Greeting: - Good morning/afternoon.

My name is _____. I am a physician / Nurse working in JUSH. We are conducting a scientific research on risk factors, patterns and outcome of IHD patients in JUSH. Therefore, I would like to inform you that you are one of the potential participants in this study. This study requires you to participate so that important information can be obtained regarding your health. Your participation is entirely based on your willingness and your refusal doesn't affect the service you get from us in any way. If you are willing to participate in the study, we will interview you and review your chart for some health related questions.

The information gathered will be used for writing a proposal for partial fulfillment of a specialty certificate in Internal Medicine at Jimma University. Your participation is only determined by you .Here, I want to assure you that any information obtained from you and your medical records will remain confidential indefinitely. The participant won`t be asked any fee during the study. You can dropout any time during the study and also you have full right to ask us questions. If, at any time, you have questions about the study, you may contact me at (+251-911-909584).

Do you wish to participate in the study?

If the participant agrees to participate in the study, proceed with interview and Draw blood for serum electrolyte after the patient has signed the consent.

I, _____have been told of the contents of this research form and I have adequate information about the research and understood it; and I do agree to participate in this Research study.

Name of Participant …….

Signature of Participant _____ Date_____

If the participant says "No, I don't want to participate in the study", thank him (her) and stop.

Thank you!

Name of interviewer_____ Date_____/_____/_____

B) Afaan Oromotin

I) Odeffanoo Qoratamaaf kennamu

Ani maqaan koo----------yoon ta'u,Karoora barrefama eebbaa irrati hirmaataa akka naaf taatan kabajaan isin gaafadha. Qorannoon kan adeemsiifamu gaaffiifi qorannoo dhiigatiin yoo ta'u, rakkoo tokkoyuu kan isinirra hin gessisne. Odeffannoon qorannoo kanarraa argamu hojii fuuldura ademsifamuf gargaarsa guddaa kenna. Qorannoo keessaa yeroo barbaadaniti bahuun kan danda'amu yoo ta'u, kuni immo tajaajila isiniif keennamu irrati dhiibbaa tokkollee hin geessisu.

II) Mallattoo Mirkanessaa

Qo'anna irrati qooda fudhachuuf yoo waligaltan bakka armaan gaddii irrati mallatton mirkanessa.

Galatoomaa

Mallattoo hirmaata qorannoo----------

Maqaa –Qorataa ----------

Guyyaa----------

Yoo qo'anna irrati qooda fudachuu hin barbaanne, Isaan galateefadhaati dhiisaa.

Questionnaire No. : ……..

Annex III: Questionnaire designed to assess the risk factors, patterns and discharge outcome of IHD patients admitted to medical wards JUSH, Nov/2014-April/2015

Medical record (card) number _____; Initials_____

Date of admission: _____ Date of discharge_____

Part I – Identification and Sociodemographic characteristics of the study participants

1. **Age of the patient _____years**
2. **Gender (Circle) 1. M 2. F**
3. **Occupation 1.farmer 2.house wife 3.governmentemployed**

4. Non-government employed 5. Student

6. Private business 7. Others (specify) _____

4. **Educational status 1.Cannot read & write 2.Read & write 3.Grade 1-8**

4. Grade 9-12 5. College

5. **Marital status: 1.Single 2.Married 3.Divorced 4.Widowed**

6. **Annual Income (in birr)_____Birr**

7. **Address (residency)**

   1. **Urban_____ 2. Rural_____**

MEDICAL HISTORY

8. **Previous history of coronary heart disease**

   1. **Yes ☐ 2. No ☐**

9. **If yes to question 8, specify_____**

10. **Do you have family history of cardiac disease?**

    1. **Yes ☐ 2. No ☐**

11. **Do you have history of cigarette smoking**

    1. **Yes ☐ 2. No ☐**

    If yes how many pack year…….

12. **Do you have comorbidities**

    12.1 **Hypertension yes ☐ no ☐**

    12.2 **diabetes mellitus yes ☐ no ☐**

    12.3 **another comorbidities (specify)_____**

HISTORY AND PHYSICAL EXAMINATION

13. **patients clinical profile and chief compliant; put <u>star on main chief compliant</u>**

    13.1 **chest pain yes ☐ no ☐**

13.2 **shortness of breath** **yes** ☐ **no** ☐

13.3 **leg swelling** **yes** ☐ **no** ☐

13.4 **cough** **yes** ☐ **no** ☐

13.5 **orthopnea** **yes** ☐ **no** ☐

13.6 **paroxysmal nocturnal dyspnea** **yes** ☐ **no** ☐

13.7 **another (specify)_____**

14. **blood pressure_____**

15. **abdominal circumference in centimeters_____**

16. **What is the NYHA class of the patient on admission?**

1. I **2.II** **3.III** **4. IV**

17. **What is the AHA Stage of the patient on admission?**

1. Sage A **2. Stage B** **3. Stage C** **4. Stage D**

LABORATORY FINDINGS

Please write the admission laboratory result from chart!

18. **FBS_____**

19. **Cardiac biomarkers**

19.1. Troponin……

19.2. CK MB……

20. **LIPID profile**

20.1 **HDL_____**

20.2 **LDL_____**

20.3 **TRIGLYCERIDES_____**

21. **ECG FINDING_____**

Is there atrial fibrillation yes ☐ **no** ☐

22. **Echocardiographic finding including ejection fraction _____**

Discharge outcome

1. ☐ **alive**
2. ☐ **dead**