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Research Article

Clinical Features and Outcome of Acute Coronary Syndrome in Patients Presenting to the Emergency Department in Addis Ababa, Ethiopia

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Abstract

Aim: To assess the clinical features, identify risk factors; describe the management and outcome of patients who present with ACS in EDs in Addis, Ababa, Ethiopia

Methods: A multicentre prospective cross-sectional study was carried out from September 21, 2018 to July 1, 2019 among patients >18 years old presenting to the ED with ACS.

Results: 40 patients were enrolled during the study period. Majority of them were males (72.5%). The average age of patients affected is 58.03 + 11.831 years. The commonest presentations were easy fatigability (92.5%) followed by chest pain and diaphoresis 77.5%. Of those who had chest pain, most (45%) expressed it as squeezing and severe in quality (40%). 65% had radiation mostly to the arms(35%) followed by the shoulder(27.5%).The mean duration of illness prior to presentation to the ED of the study area was 4.41+2.83. The commonest risk factors identified were hypertension (60%) and type 2 DM (57.5%). STEMI was the major type of MI identified (67.5%) with 30% in Killip class I. NSTEMI was seen in 17.5% and Unstable angina in 15%. Heart failure was the commonest complication at presentation. The commonest echocardiography finding was wall hypokinesis (67.5%) followed by decreased Ejection fraction (37.5%). Patients with STEMI had higher increase in the cardiac markers than NSTEMI. None of the patients received thrombolytic/fibrinolytic. PCI was done for 42.5% with only 15% done as primary PCI. Most patients (70%) stayed in the ED for more than 24 hours up to 7days. Death within 7 days of admission to the hospital while in patient occurred in 10%. The live discharge rate was 90%.

Conclusion: Patients present very late to the Emergency department; most of them with STEMI with heart failure as the commonest complication upon presentation. They then stay in the emergency department for prolonged period of time in limited technical facilities which pose major difficulties of their management and subsequently poorer quality of life.

Acronyms: AaBET: Addis Ababa Burn, Emergency and Trauma Centre; ACS: Acute Coronary Syndrome: A.fib: Atrial Fibrillation; AMI: Acute Myocardial Infarction; ART- Antiretroviral Therapy; ACEI: Angiotensin converting enzyme inhibitors; ARBs: Angiotensin Receptor Blockers; BID: “Bis in die” (Latin), twice a day; BP: Blood Pressure; CABG: Coronary Artery Bypass Graft; CAD: Coronary Artery Disease; CI: Confidence Interval; CKMB:Creatinine Kinase Muscle/Brain; CNS: Central Nervous System; COR: Crude Odds Ratio; CRVHD: Chronic Rheumatoid Valvular Heart Disease; DM: Diabetes Mellitus; DKA: Diabetic Ketoacidosis; DCMP: Dilated Cardiomyopathy; ECG: Electrocardiography; ED: Emergency Department; GRACE: Global Registry of Acute Coronary Events; HDL: High Density Lipoprotein; HIV: Human Immunodeficiency Virus; HMIS: Health Management Information Systems; IHD: Ischemic Heart Disease; ICU: Intensive Care Unit; LDL: Low density Lipoprotein; LVH: Left Ventricular Hypertrophy; LBBB: Left Bundle Branch Block; MI: Myocardial Infarction; MVR: Mitral Valve Replacement; NSTEMI: Non- ST Elevation Myocardial Infarction; PO: Per Os (Oral); PCI: Percutaneous Coronary Intervention; PVCs: Premature Ventricular Complexes; PLWH: People Living With HIV; RVI: Retroviral infection; SSA: Sub-Saharan Africa; STEMI: ST- elevation Myocardial Infarction; TAG: Triacylglycerol; TASH/BLH:TikurAnbessa Specialized Hospital/Black Lion Hospital; TIA: Transient Ischemic Attack; UFH: Unfractionated Heparin

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Introduction

Background

Acute Coronary syndrome refers to the group of clinical manifestations that result from inadequate perfusion of the heart. It is a spectrum that includes unstable angina, NSTEMI and STEMI. It is seen in those people who have atherosclerosis of the blood vessels resulting in narrowing of the blood pipes supplying the heart. Widely known risk factors include Smoking, Diabetes Mellitus, Dyslipidemia, old age, hypertension, obesity, physical inactivity (sedentary lifestyle) and family history of AMI in early age.

Patients present to the ED mainly with a complaint of chest pain that can be described with as squeezing, crushing, or as chest tightness which is retrosternal with vague localization. It may radiate to the shoulders, jaw, neck and inner part of the left arm. In others, they may not have any complaint of chest pain rather they complain of tiredness, shortness of breath, diaphoresis, nausea, or epigastric discomfort. This is usually termed as atypical presentation and ACS should be highly suspected in obese, diabetic and fatty women with these atypical presentations.

Acute coronary syndrome is diagnosed when patients present with a history of chest pain that is becoming more frequent, staying for longer than before, with above qualities described associated with nausea, vomiting, diaphoresis or syncope plus ECG and cardiac biomarker results.

Unstable angina is chest pain that is worse, more frequent or new onset chest pain with signs of Ischemia on the ECG but no injury to the heart tissue as evidenced by absence of rise in biomarkers.

NSTEMI is chest pain of cardiac origin with signs of ischemia and injury to the heart tissue as evidenced by ST depression, T wave inversion with increase in the markers of cardiac injury (Troponin I, Troponin T and CKMB). This type of ACS has a worse prognosis relating to morbidity as compared to unstable angina.

STEMI, also commonly referred to as heart attack, is the worst of the three; it is diagnosed with ST segment elevations in the ECG indicative of transmural necrosis of the heart because of severe obstruction to the perfusing artery, and elevated cardiac biomarkers.

Acute coronary syndrome is a medical emergency that should be intervened fast because of the eventually significant morbidity and mortality.

Statement of the problem

Coronary Artery Disease has raised greatly in low income and middle income countries accounting for 80% of the burden occurring in these countries [22,23]. A decade ago, Myocardial Infarction (MI) was the 8th leading cause of death in Sub-Saharan Africa (SSA) , the leading cause of death in men above 60years and the 2nd leading cause of death in women >60years[16,29]. Ischemic Heart Disease (IHD) accounted for 7.7% of 1006 patients with new onset heart failure recruited from 12 cardiology centres in 9 countries over a 4 year study period [20]. Coronary Artery Disease was attributed to 6% of cardiac symptoms in The Heart of Soweto study which included 1593 patients with cardiac symptoms[9]. The onset occurs in those under 65 years old [21].

In Ethiopia, Myocardial infarction was the 3rd commonest cause of admission after severe malaria and Diabetic Ketoacidosis (DKA) accounting for 8.8% of admissions to Medical ICU in Black Lion Hospital[29]. Not only that but, according to a 2001 report from Menelik II Memorial Hospital Autopsy results of people after sudden deaths, coronary artery disease accounted for 70% of those who died of cardiac causes[28].

For a resource limited country like ours, prevention should take quite a role rather than treat once the event occurs, given the cost of standard of care and treatment of ACS. The emergency department plays a prominent role concerning ACS, since it is the place where it will be first suspected and the site where rate limiting measures to be started once diagnosed, which determine both the morbidity and mortality of the patient. Despite this, an elaborate study concerning acute coronary syndrome is lacking with most studies done nearly 10 years back and are retrospective than prospective.

For these reasons, this multicentre prospective research to assess the pattern of ACS in patients presenting to the emergency department, their commonest risk factor and commonest presentation will help the physician and the public health at large on which areas to focus. It will also give an insight on how to tackle these issues.

Literature review

The prevalence of coronary artery disease has been increasing in the Sub-Saharan Africa in the past decades. Although there are no country wide prospective studies done in different parts of Africa, institutional studies and many small studies have shown growth throughout the decades. According to a WHO report on cardiovascular diseases in 2011, coronary artery disease has raised greatly in low income and middle income countries and these countries will contribute to 80% of the burden in the world [27,28].

In a prospective study done in Dakar, Senegal on Acute coronary syndrome in young sub-Saharan Africans of age under or equal to 40 years, the hospital prevalence was found to be 0.45% [4]. Another prospective study that was done in Abidjan heart Institute which got published in 2016, the prevalence was 13.5% out of 425 patients [6]. In Nigeria, out of 1347 people, Ischemic Heart Disease accounted for 0.9%[40] where as in a private Hospital in Kenya, 5.1% of admissions to ICU from 2008-2010 were due to Acute Coronary Syndrome[11]. The Hospital prevalence in Addis Cardiac clinic, Ethiopia on a study on acute coronary syndrome using diagnostic Angiography, Coronary Artery Disease was confirmed in 58.5% in those under 45 years and 79.6% in those above and equal to 45 years old out of 300 patients included in the study [12].

Like in the Western setup, Acute Coronary Syndrome in Africa also has a male predilection. In the study in Addis cardiac clinic in Ethiopia, 83% with confirmed coronary artery disease were males, with the commonest age range affected being 50-59 years. [12] Another study done in Black lion Hospital, Ethiopia published on 2013 also confirms the male predominance, accounting for 65.2% with a mean age of 57.1+/-13.7 years [3]. In Djibouti, the male to female ratio was found to be 7.7:1 with a relatively similar age group affected being 52+/-11 years. This age group was found to be 10-15 years younger than the Western Countries' [7].

The INTERHEART and INTERSTROKE studies were landmark

case control studies which confirmed 9 modifiable risk factors that account for approximately 90% of the population attributable risk for Myocardial Infarction and Stroke in all regions of the world including Sub-Saharan Africa. This included high blood pressure (19.8-26% in rural Nigeria and Kenya, 23.7-40.1% in Urban Tanzania and Namibia), Diabetes Mellitus, Current/former use of tobacco, high lipoprotein (Apo B/Apo A ratio), abdominal obesity, unhealthy diet, increased psychosocial stress and physical inactivity [32,31]. These risk factors have been increasing over the last 5-8 years throughout most of the continent[9,37,33-36,38]. The level of risk imparted by a pro-atherogenic risk factor profile for MI is independent of race, ethnicity and Geography[31,39]. In addition to that, there is also compelling evidence that the risk factors for atherosclerosis driven by urbanization, industrialization and its consequences on lifestyle, diet and physical activity are on the rise, according to cardiology in Africa review Series.

The risk factors for Coronary Artery Disease pre-angiography determined in Addis cardiac centre in Ethiopia has also found that Hypertension(61.2%), dyslipidemia (63%) and DM (41.4%) were the main risk factors for CAD with 91% of the 300 study participants having at least 1 risk factor[12]. In Dakar, smoking was the commonest risk factor identified accounting for 52.4%[4] whereas in Djibouti, hypercholesterolemia (83%), tobacco use (60%), Khat chewing (57%), DM (49%), Hypertension (46%) and heredity (20%) were the risks identified[7]. Although Khat chewing was found to be a risk factor in Djibouti, it had no effect on the prognosis of the ACS.

According to a systematic review on the Association between HIV and atherosclerotic disease in SSA, extensive thrombus and hypercoagulability were found to be contributing factors for ACS; yet, potential confounders that should be kept in mind included CNS infections and immunosuppressed ART naïve PLWH [5].

The commonest presenting symptom that was found in a study done in Dakar, Senegal was chest pain, 95.2%. The average time delay before medical care from the time of symptom onset was 14.5 hours[4]. In Abidjan Heart Institute as well, the average time of admission after symptom onset was relatively similar, 12 hours[6]. This time was found to be significantly increased as compared to a study done in Djibouti with the average presentation time of 5 hours after symptom onset but relatively similar time of admission of 12 hours as seen in 43 of the patients included in the study [7].

The predominant type of Acute Coronary Syndrome was STEMI in studies done in Black lion Hospital (Ethiopia), Dakar (Senegal) and Abidjan accounting for 62%, 85.7% and 71.5% respectively [3,4,6]. Coronary Artery Disease was confirmed by angiography in 75.7% of 300 patients diagnosed with ACS in a study done in Addis Cardiac centre, in Ethiopia[12]. Of these, 85% had significant disease (defined as >50% stenosis of the left main coronary artery or >70% stenosis at other coronary beds). Single vessel disease accounted for 43.2%, multi-vessel disease for 40.5% and left main coronary disease in 1.3%. Echocardiography findings included decreased left ventricular systolic function in 37.5%, left ventricular thrombus in 20% in the study done in Dakar [4].

The limitation of resources available in SSA, have a great impact on the standard management of ACS. This results in more dependence on the pharmacological management rather than interventional (PCI and CABG) management. In TASH, Ethiopia, patients with a diagnosis of ACS, all were given anti-platelets and statins but no thrombolytic[3]. According to ACS in young SSA done in Dakar Senegal, out of 21 patients, thrombolysis was done in 44.4% of patients with STEMI [4]. PCI was done in 22.5% (6.6% of STEMI) and fibrinolytics were given in 8.2% in Abidjan Heart Institute on a study published in 2016 [6]. Thrombolysis was also successfully done in 73% of 35 patients on a study done in Djibouti[7].

The in-hospital mortality of patients admitted with ACS depends on many factors. In a retrospective study performed at a single tertiary heart centre in Northeast Thailand, factors associated with in-hospital mortality included age >60 years and left ventricular ejection fraction <40% [41]. In GRACE eight risk factors accounted for 89.9% of the prognostic information which includes older ages, higher Killip class, systolic blood pressure, ST-segment deviations, cardiac arrest during presentation, serum Creatinine level, positive initial cardiac enzyme finding and heart rate [42]. Use of aspirin, Clopidogrel, ACEI, statin, and PCI were significantly associated with in-hospital mortality in a study done in China [43]. In a study done in TASH, factors found to have significant association with the in-hospital mortality were old age, delayed time of presentation, patients who have previous history of hypertension, higher Killip class and patients who were diagnosed to have STEMI [1].

Objective

General objective

To assess the features of patients presenting with Acute Coronary Syndrome to the Emergency departments in Addis Ababa, Ethiopia.

Specific objectives

To identify clinical features of ACS patients presenting to the ED in Addis Ababa, Ethiopia.

To identify risk factors related with ACS in patients presenting to the EDs in Addis Ababa, Ethiopia.

To describe the management of ACS in the EDs in Addis Ababa, Ethiopia.

To determine the outcome of ACS patients presenting to the ED in Addis Ababa, Ethiopia.

Methodology

Study area and study period

It is conducted in the two emergency centres of Ethiopia, TASH ED and AaBET hospital on patients with an admission diagnosis of ACS during the study period. These two sites are chosen because they are the two largest emergency centres in Ethiopia run by Emergency Physicians.

TASH (Black Lion Hospital) is a tertiary referral hospital that sees around 370,000-400,000 patients per year, although the exact number is not known. The hospital has a total of 800 beds. It is also the teaching hospital affiliated with Addis Ababa University, School of Medicine. The Emergency department was established and run by emergency Physicians for the past 7 years. It sees around 80,000 critical patients referred from the different hospitals per year. It has

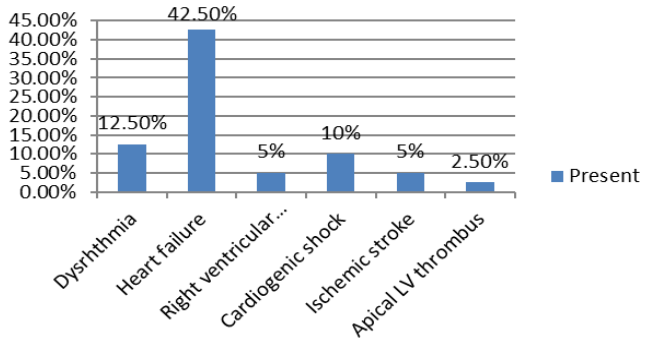

Figure 1: Complications upon presentation of patients with ACS presenting to the ED, Addis Ababa, Ethiopia, September- July, 2019.

a red zone which has 7 beds, 2 mechanical ventilators and monitors for each bed. TASH also has a well-equipped ICU with a total of 20 beds, 6 beds for surgical ICU, 6 beds for adult medical ICU, 4 beds for Pediatric ICU and 4 beds for Cardiac ICU.

Addis Ababa Burn, Emergency and Trauma (AaBET) Hospital is a part of St. Paul referral hospital and is the first Emergency, Burn and trauma centre founded in Ethiopia since 3years back. The emergency department has Red zone with 7 beds, Orange zone with 7 beds and Yellow Green zone with 40 beds. It also has ICU with a total of 15 beds. Both the Emergency and ICU are run by the Emergency and Critical care specialists.

Study design

A prospective descriptive cross-sectional study was employed.

Study period

From September 21, 2018- July 1, 2019.

Study population

Source population.

All patients with acute coronary syndrome who visited TASH ED and AaBET hospital.

Sample population

All patients who have a diagnosis of ACS and are kept in TASH ED and AaBET hospital during the study period.

Sampling method and sample size calculation

Convenience sampling is used. All patients who are admitted during the study period are included.

Inclusion and Exclusion Criteria

Inclusion Criteria

Age >= 18yrs old with a presumed diagnosis of ACS at admission who have ECG, cardiac marker results.

All patients in whom ACS is an incidental finding.

Exclusion Criteria

Patients who do not have ECG and cardiac biomarkers.

Patients who present within the study period for re-infarction after a previous admission during the study period.(Patients coming for the second time during the study period).

Variables

Independent variables

Age

Sex

Previous illness(DM, Hypertension, Dyslipidemia, obesity)

Type of symptom at presentation

Type of ECG features the patient presents with

Type of ACS the patient has

Level of cardiac marker increase at presentation

Time of presentation from symptom onset to arrival to the ED

Dependent Variables

Complications at presentation (Killip classification)

Length of stay in the ED before admission to the ICU

Treatment started after the diagnosis of ACS in the ED

In hospital mortality rate

Data collection

Data collection is done using structured questionnaire that is made by modifying a questionnaire used in a published research. It is filled by the principal investigator in the TASH ED and an Emergency and critical care resident who is informed on how to fill the questionnaire in AaBET hospital. Missed data is handled by revising the chart and filling the gaps. Significantly large missed data on objective measurement of body mass index and abdominal girth was omitted from the analysis.

Statistical analysis

Statistical analysis is done by SPSS version 16.0. The relationship between independent and dependent variables are done by using bivariate logistic regression. The odds ratio was calculated with 95% confidence interval (95% CI) for previously known independent predictor variables. They were considered statistically significant if their p-value is < 0.05.

Ethical considerations

Before data collection, a letter was written by the Emergency and Critical Care Medicine department for grant of permission for the research. Another letter of permission was also sent to AaBET hospital. The names of patients are replaced with codes to avoid individual identifiers.

Operational definitions

Treatment outcome: treatment outcome of patients with ACS is explained mainly by in-hospital mortality. It will be calculated by dividing the total number of patients who died during their hospital stay by the total number of patients who participated in the study.

In-hospital mortality is defined as the percentage of patients who died during their hospital stay.

Previous myocardial infarction (MI): The patient has had at least 1 documented previous MI before admission.

Table 1: Characteristics symptoms of patients presenting to the ED, Addis Ababa, Ethiopia, September- July, 2019.

Symptoms at presentation	Percentage	Frequency	
Easy fatigability	92.50%	37	
Chest pain	77.50%	31	
Diaphoresis	77.50%	31	
Epigastric discomfort	70%	28	
Nausea/vomiting	50%	20	
Shortness of breath	30%	12	
Incidental finding	10%	4	
Characteristics of chest pain	Yes	Total	
	Freq. (%)	Freq. (%)	
Radiation	26(65%)	31(77.5%)	
Neck	5(12.5%)	31(77.5%)	
Jaw	3(7.5%)	31(77.5%)	
Arm	14(35%)	31(77.5%)	
Left arm	10(25%)	14(35%)	
Both arms	4(10%)	14(35%)	
Shoulder	11(27.5%)	31(77.5%)	
Left shoulder	6(15%)	11(27.5%)	
Right Shoulder	1(2.5%)	11(27.5%)	
Both shoulders	4(10%)	11(27.5%)	
Back	9(22.5%)	31(77.5%)	
Characteristics of chest pain	Yes	No	Total
Squeezing	18(45%)	13(32.5%)	31(77.5%)
Stabbing	8(20%)	23(57.5%)	31(77.5%)
Heaviness	4(10%)	27(67.5%)	31(77.5%)
Dull aching	4(10%)	27(67.5%)	31(77.5%)
Quality of Chest pain	Yes	No	Total
Mild	1(2.5%)	30(75%)	31(77.5%)
Moderate	14(35%)	17(42.5%)	31(77.5%)
Severe	16(40%)	15(37.5%)	31(77.5%)
Findings upon presentation	Mean	Standard deviation	Range
Systolic BP(mm Hg)	124.75	28.447	80-195
Diastolic BP(mm Hg)	75.05	19.158	42-111
Heart rate (beats/minute)	93.05	17.859	50-126
Respiratory Rate(breaths/ minute)	23.4	5.93	12-40
GCS(Scored out of 15)	14.65	1.747	4-15

Dyslipidemia: patient has had previously documented dyslipidemia.

Current tobacco use: Smoking cigarettes within 1 month of this admission.

Previous Tobacco use: Has stopped smoking for at least the past 1 month before admission.

Killip class: Killip class of the patient at the time of hospital admission:

Class 1: No evidence of heart failure.

Class 2: Findings consistent with mild to moderate heart failure (S3, lung rales <1/2 way up the posterior lung fields, jugular venous distension).

Class 3: Overt pulmonary edema.

Class 4: Cardiogenic shock.

Table 2: Risk factors identified in patients with ACS presenting to the ED, Addis Ababa, Ethiopia, September- July, 2019.

Risk factors Identified	Yes	No	Unknown
Type 2 DM	23(57.5%)	17(42.5%)	-
Hypertension	24(60%)	16(40%)	
Dyslipidaemia	9(22.5%)	20(50%)	11(27.5%)
Obesity	11(27.5%)	29(72.5%)	-
RVI	3(7.5%)	37(92.5%)	
Cigarette Smoking	12(30%)	28(70%)	
Currently smoking	4(10%)		
Previous history of use	8(20%)		
Chat Chewing	10(25%)	30(75%)	
Previous MI	4(10%)	36(90%)	
Premature CAD	2(5%)	34(85%)	4(10%)

Elective PCI: PCI done for STEMI if patients have persistent symptoms or have a significant occlusion which is not the culprit artery for the current presentation on angiography. It is done on an elective basis.

Rescue PCI: is mechanical reperfusion for failed fibrinolysis for acute MI.

Primary PCI: mechanical intervention for acute MI done immediately upon diagnosis of MI.

Intermediate ward: It is a ward where patients can be transferred from the emergency department until bed for the respective ward is available. It is intended to relieve the ED over-crowding in TASH.

Results

Socio-demographic status of the patients

There were a total of 40 ACS patients seen during the study period from both study sites (AaBET and Black Lion Hospital). They were in the age range between 29 and 84, with an average age of 58.03 + 11.831 years. Majority of them were males accounting for 29 (72.5%) with an M: F ratio of 2.6:1.

Characteristics of the patient on arrival

Majority of patients with ACS presented with easy fatigability 37(92.5%) followed by chest pain and diaphoresis each accounting for 31(77.5%). Of those patients who had chest pain, 26(65%) had radiating chest pain commonly to the arms, 14(35%), followed by the shoulder 11(27.5%). They mostly describe their chest pain as Squeezing, 18(45%) and severe in quality, 16(40%).

Pulmonary edema was present in 16 (40%) of patients who presented to the emergency with ACS. The vital signs and GCS at presentation to the ED are summarized in Table 1.

The average time of presentation after symptom onset was 4.41 + 2.83 days with a range from 1 hour to 14 days.

The commonest risk factors identified were Hypertension and Diabetes Mellitus each accounting for 24(60%) and 23(57.5%) respectively. Only one patient had history of previous stroke/TIA. Other possible risk factors that were found in 12(30%) of patients with ACS include underlying IHD in 4(10%) and breast cancer on medications in 2(5%). Alcoholism with fatty liver, Cholelithiasis, DCMP, known Asthma, Polycythemia and post mitral valve replacement Chronic rheumatoid valvular heart disease with Atrial

Table 3: Diagnosis and Diagnostic investigations done for ACS patients presenting to the ED, Addis Ababa, Ethiopia, September- July, 2019.

ECG findings		Frequency		%
ST elevation		28		70%
ST depression/T wave inversion		6		15%
Previous LBBB fulfilled Sgarbossa criteria		2		5%
PVCs		1		2.50%
2nd degree AV block		1		2.50%
Unremarkable ECG		2		5%
Type of cardiac markers done		Frequency		%
CKMB		7		17.50%
Troponin I		37		92.50%
Troponin T		4		10%
CK MB and Troponin I		6		15%
CK MB and Troponin T		1		2.50%
Echocardiography		Frequency		%
Yes		33		82.50%
No		7		17.50%
Echocardiography findings		Frequency		%
Decreased Ejection Fraction		15		37.50%
Wall hypokinesis		27		67.50%
New regurgitation		2		5%
Decreased EF &Wall hypokinesis		12		30%
LV thrombus & wall hypokinesis		2		5%
Diagnosis of MI		Frequency		%
STEMI		27		67.50%
Killip class I		12		30%
Killip class II		7		17.50%
Killip class III		5		12.50%
Killip class IV		3		7.50%
NSTEMI		7		17.50%
Unstable angina		6		15%
Lab.Ix	Minimum	Maximum	Mean	Standard deviation
LDL (mg/dl)	52	142	96.09	33.14
HDL (mg/dl)	16	56	33.88	13.14
Total cholesterol (mg/dl)	52	207	135.33	51.89
Triacylglycerol (mg/dl)	56	153	98.22	29.86
RBS	69	450	185.48	94.64
Creatinine	0.6	2.16	1.19	0.41

fibrillation were also the rare underlying illnesses which could have some contribution to the development of ACS in this patients. See Table 2.

Out of the 30% who said yes to tobacco smoking, 12(25%) had previous history of tobacco use with a mean of 22.22 + 21.77 pack years. Patients classified as current users of cigarettes (defined as cigarette use in the past 1 month) accounted for 4(10%). The mean number of cigarettes smoked by these people was 15.75 + 8.5 cigarettes per day with a median of 20 cigarettes (1 pack per day).

Counting comorbidities as one risk factor, 38(95%) of the patients who presented with ACS to the ED had at least 1 risk factor. Most, 12(30%) of the patients had 3 identified risk factors. Only 2(5%) of the patients did not have any identifiable risk factors.

Diagnosis and Investigations done to confirm diagnosis

All patients who were diagnosed with ACS in the study period had ECG and cardiac markers done for them. The majority, 27 (67.5%) of these patients had STEMI, in Killip class I, 12 (30%). Only 3 patients came in with cardiogenic shock among the STEMI patients. See Table 3.

The commonest ECG finding was ST elevation accounting for 28(70%) and it was unremarkable in only 2 patients despite increment in cardiac markers.

All patients had at least one of the cardiac markers done for them. The most widely used cardiac marker was Troponin I, it was done for 37(92.5%) of the cases. The level of troponin I rise from the upper limit in STEMI patients had a mean of 473.05+774.97 with a median

Table 4: Treatment given to patients presenting with ACS to the ED, Addis Ababa, Ethiopia, September- July, 2019.

Treatment given	Yes	Started in the ED
Aspirin	39(97.5%)	23(57.5%)
Loading(300-375mg)	37(92.5%)	
Maintenance(81mg)	39(97.5%)	
Clopidogrel	37(92.5%)	25(62.5%)
Loading(300-375mg)	36(90%)	
Maintenance(75mg)	36(90%)	
Statins	37(92.5%)	23(57.5%)
Atrovastatin	36(90%)	
Simvastatin	1(2.5%)	
Anticoagulants	33(82.5%)	25(62.5%)
UFH	28(70%)	
Enoxaparin(8000 SC BID)	2(5%)	
Warfarin	2(5%)	
Beta blockers(Metoprolol)	25(62.5%)	18(45%)
Max daily dose(200mg)	3(7.5%)	
Morphine	32(80%)	31(77.5%)
Nitrates	12(30%)	10(25%)
Sublingual	11(27.5%)	
Isosorbide Dinitrate PO	1(2.5%)	
ACE inhibitors/ARBs(Enalapril)	14(35%)	5(12.5%)
Calcium channel blockers	3(7.5%)	-
PCI	17(42.5%)	
Primary	6(15%)	
Elective	11(27.5%)	

Table 5: Significance of the different variables in predicting patient outcome in patients with ACS presenting to the ED, Addis Ababa, Ethiopia, September- July, 2019.

Predictor variables	COR(CI)	p-value
Chest Pain	1.167(0.106-12.805)	0.9
Age	1.000(0.915-1.092)	0.996
LOI	0.901(0.596-1.362)	0.621
Hypertension	1.571(0.198-12.470)	0.669
Chat	0.80(0.007-0.895)	0.045
Systolic BP	1.014(0.977-1.052)	0.458
Diastolic BP	1.048(0.982-1.118)	0.158
Heart rate	1.007(0.949-1.069)	0.816
Respiratory rate	1.103(0.945-1.287)	0.214
GCS	0.118(0.007-1.919)	0.133
RBS	1.006(0.993-1.020)	0.363
Pulmonary Edema	0.188(0.018-2.002)	0.166
Creatinine	2.759(0.266-28.568)	0.395
Dysrhythmia	0.375(0.031-4.525)	0.44

of 300. As compared to NSTEMI patients, whose mean rise in the troponin level is 256.58+429.78 and had a median of 52, this value was found to be very high.

Echocardiography was done for 33 (82.5%) patients. The commonest finding was wall hypokinesis. It was seen in 27(67.5%) of those who had echocardiography done for them, followed by decreased ejection fraction in 15(37.5%). Only 1 patient had decreased ejection fraction, wall hypokinesis and new regurgitation on echocardiography. None of the patients who had echocardiography done had ruptured free wall or septal wall upon presentation.

Random blood sugar was done for 23 patients (57.5%). The serum Creatinine was determined for 32 patients out of the 40 (80%) and lipid profile was done for 9(22.5 %) of the patients, the values are listed in the table.

Complications at presentation

Heart failure was present in 17(42.5%) was the commonest complication identified upon presentation to the ED followed by dysrhythmia in only 5(12.5 %) of the patients with ACS upon presentation. The types which were seen were 2nd degree AV block, 3rd degree AV block, bradycardia, premature ventricular contractions and ventricular tachycardia, each accounting for 2.5% of the cases with dysrhythmia. Right ventricular infarction was seen in 2(5%), apical left ventricular thrombus in 1(2.5%), ischemic stroke in 2(5%) and cardiogenic shock in 4(10%) patients upon presentation to the emergency department. None of the patients had mechanical complications and pericarditis up on presentation. See Figure 1.

Pharmacologic treatment started upon hospitalization

The pharmacologic management of ACS patients in the study area is mostly in line with standard management protocols used worldwide. Most of the patients have received antiplatelet agents, anticoagulants, beta blockers and statins. See the Table 4 and 5.

Reperfusion (Revascularization) Therapy

Percutaneous coronary intervention was done for 17(42.5%) of the patients who presented with ACS. It was done as a primary procedure in only 6(15%) of the patients. In the rest 11(27.5%), it was done as elective PCI. There was one patient who had angiography done without subsequent PCI because there was no visible occlusion.

None of the patients received thrombolytic therapy nor Coronary artery bypass graft (CABG).

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