

**PATTERN OF CONGESTIVE HEART FAILURE AT ADULT EMERGENCY
MEDICINE DEPARTMENT, TIKUR ANBESSA SPECIALIZED
HOSPITAL,AAU, AA, ETHIOPIA.**

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Abbreviations and acronyms

- CHF Congestive Heart failure
- CRVHD Chronic Rheumatic Valvular Heart Disease
- JUSH Jima university Specialized Hospital
- HHD Hypertensive Heart Disease
- CXR Chest x-ray
- ECHO Echocardiography
- WHO World Health Organization
- ED Emergency Department
- TASH Tikur Anbessa Specialized hospital
- AAU Addis Ababa University
- AA Addis Ababa
- CVD Cerebro-vascular Disease
- HIV Human Immunodeficiency Virus
- AIDS Acquired Immunodeficiency Syndrome
- HHD Hypertensive heart disease
- BP Blood pressure
- PR Pulse rate
- RR Respiratory rate
- CBC Complete blood count
- EKG Electrocardiography
- PND Paroxysmal nocturnal dyspnea
- U/A Urine analysis
- JVP Jugular venous pressure
- UTI Urinary tract infection
- AMI Acute myocardial infarction

ABSTRACT

Background: Rheumatic heart disease is the commonest cause of cardiac disease in general and Congestive Heart Failure in most sub-Saharan African countries, followed by hypertensive heart disease which is rising along with other non-communicable diseases. However the pattern of congestive heart failure in our setting is not known (1). Therefore the objectives of this study were to assess the common causes of heart failure, common precipitating factors, ED stay of patients admitted with CHF, ED mortality of Patients admitted With CHF and predictors of ED mortality and common clinical presentations of patients with CHF.

METHODS: A prospective cross-sectional study was conducted on 128 patients who were admitted to adult emergency medicine department of Tikur Anbessa specialized hospital, Addis Ababa university, Addis Ababa, Ethiopia with diagnosis of CHF. The study population was 128 patients who were admitted with the diagnosis of CHF, during four Months period, Dec 1/2013 to March 31/2014. The patients condition on discharge or admission to ward was followed. The data were collected using structured pretested data collection tools and analyzed using SPSS for windows version 20.0.

Results: During the data collection time frame 128 patients, 75 (58.6%) female and 53 (41.4%) male, with CHF were admitted to the emergency department. Fifty percent of patients were within the age range of 12 to 29 years. CRVHD was the most common ECHO finding in 67 (52.3%) of the patients followed by DCMP 14(10.9%), Corpulmonale 10 (7.8%), IHD 8 (6.3%), HHD 4 (3.1%) and peripartal cardiomyopathy 2 (1.6%). The most common precipitating factor identified was pneumonia 46 (35.9%) followed by arrhythmias 29 (22.7%), discontinuation of CHF therapy 20 (15.6%) and natural course of the disease or refractory CHF in 10 (7.8%) of the patients. Shortness of breath was the commonest symptom 121(94.5%) of patients and tachypnea was the commonest sign 104 (81.3%). Only 38 (29.7%) of patients were disposed from the ED within the first 24 hours. Four patients (3.1%) died at ED and statistically significant predictors of mortality could not be identified.

Conclusion and recommendations: The most common cause of CHF at TASH, Ethiopia is CRVHD, which accounts for more than fifty percent of the causes. The most common precipitating factor is pneumonia. Concerned body should focus on prevention, diagnosis and treatment of CRVHD.

Chapter one

1. Background

During the decades of the 1930s to the 1950s, infectious diseases came under control. The problem of the infectious diseases was replaced in the 1940s and 1950s by the mounting epidemic of cardiovascular disease (CVD). By the 1950s, 1 of every 3 men in the United States developed CVD before reaching the age of 60 years. Though less prevalent in women, the development of CVD in women had debilitating and often fatal consequences. Its prevalence was twice that of cancer. It had become the leading cause of death and the reason why life expectancy beyond age 45 years did not increase. Furthermore, there were no known treatments capable of prolonging life, even in those who managed to survive an attack. Added to this was the fact that little was known about the determinants of the disease process itself, so methods for reversing the epidemic were not even conjectured. So Cardiovascular disease (CVD) is among leading causes of death and disability worldwide (2). The most important thing is it is double burden for Sub-Saharan Africa including Ethiopia, on the top HIV/AIDS and other infectious diseases and it was very important to have first of its kind ED study, In TASH and may be in the country.

During the course of cardiac disease a subset of them develop heart failure. The vast majority of heart failure causes in sub-Saharan Africa were due to the major non-ischemic causes; with rheumatic heart disease (RHD), hypertensive heart disease (HHD), and cardiomyopathy accounting for over 75% of cases (1, 3).

Ethiopia as one of the African countries also shares the burden of cardiac disease. Some studies conducted in the country indicated that the two major causes of cardiac disease are RHD and HHD furthermore IHD is on the rise (1). Determining the current pattern of causes of HF in our setting was required which could also be considered as the beginning of efforts to put forward in characterization of the most prevailing causes and precipitating factors of HF in our setting and ultimately improve its detection, treatment and possibly prevention . Therefore, this study was carried out to describe the pattern of CHF among patients who were admitted Emergency medicine department of TASH.

1.2 Statement of The problem

RHD disease was the commonest cardiac disease in most sub-Saharan African countries, followed by hypertensive heart disease, but little was known about the pattern of CHF at our setting.

Study done at JUSH by Belete H. et al showed RHD was the leading cause of heart diseases, accounting 32% of patients followed by, HHD((24%) and cardiomyopathy, which showed us the shifting of epidemiology of heart diseases, which was double burden for us on the top communicable diseases(1).

Study done by Oli k. et al also in TASH medical ward to evaluate severity of rheumatic heart disease showed that RHD was common cause of mortality (26.5%), among those seventy percent were female(4). So as this study shows heart failure was the significant problem of our hospital and most probably our country, it was very important to determine current pattern and also to have ED study. The objective of this study was to assess pattern of congestive heart failure,that will help us on early identification, treatment and prevention of common causes and precipitating factors.

1.3 Significance of the study

CHF is one of the commonest causes of morbidity and mortality in Ethiopia, so it is very important to assess the pattern of CHF in order to focus on most prevailing etiologies and precipitating factors for development of management guidelines in the ED.

Chapter Two

Literature Review

Diseases of the cardiovascular system vary throughout the world in type and distribution especially between the developed and the developing countries. Whereas in the former, coronary artery disease is the leading cause of heart failure, in the later, it is rare.⁵ Climate, genetic and socioeconomic factors are given as possible reasons for these differences, but they operate between and within developing countries.⁶

The heart failure syndrome has been recognized as a significant contributor to cardiovascular disease burden in sub-Saharan African for many decades. Seminal knowledge regarding heart failure in the region came from case reports and case series of the early 20(th) century which identified infectious, nutritional and idiopathic causes as the most common. With increasing urbanization, changes in lifestyle habits, and ageing of the population, the spectrum of causes of HF has also expanded resulting in a significant burden of both communicable and non-communicable etiologies. Heart failure in sub-Saharan Africa is notable for the range of etiologies that concurrently exist as well as the healthcare environment marked by limited resources, weak national healthcare systems and a paucity of national level data on disease trends.⁷

The vast majority of heart failure causes in sub-Saharan Africa are due to the major non-ischemic causes; with rheumatic heart disease (RHD), hypertensive heart disease (HHD), and cardiomyopathy accounting for over 75% of cases in most series (3, 8, 9,10)

Ethiopia as one of the African countries also shares the burden of cardiac disease. Some studies conducted in the country indicated that the two major causes of cardiac disease are RHD and HHD furthermore IHD is on the rise (11, 12, 13). Determining the current pattern of cardiac disease in our setting is required which can also be considered as the beginning of efforts to put forward in characterization of the most prevailing cardiac diseases in our setting and ultimately improve its detection, treatment and possibly prevention. Therefore, this study was carried out to assess pattern of CHF among patients who were admitted the ED of Tikur Anbessa Specialized Hospital (TASH), with the diagnosis of CHF.

Chapter Three

Objectives of the study

3.1 General objective: To assess pattern of congestive heart failure.

3.2 specific objectives: The objectives of this study were to assess the common causes of heart failure, common precipitating factors, ED stay of patients admitted with CHF, ED mortality of Patients admitted With CHF and predictors of ED mortality and common clinical presentations of patients with CHF.

Chapter Four

METHODS AND MATERIALS

4.1 Study setting

The study setting is TASH located in Addis Ababa, capital city of Ethiopia, Which is the biggest specialized hospital in the country and receives many patients from the city of AA and all over the country. TASH recently started emergency medicine specialty program which is first of its kind in the country. Ethiopia is among few African countries, to start the field of specialty. Currently the ED is giving service as independent department. The ED is staffed with residents, nurses, 3 seniors and guest instructors coming from Toronto University and Wisconsin University.

4.2 Study design and Period

A prospective cross-sectional study was employed to describe pattern of CHF of patients who were admitted with the diagnosis of CHF to the ED of TASH, during the period of Dec 1, 2013 to March 31, 2014, data collection was conducted.

4.3 Method of data collection

Data was collected using pretested structured tools by the investigator. The tools included the card number, the date of admission to ED, socio-demographic variables (age, sex, residence of patient) and patient diagnosis including investigations regarding to the underlying cardiac disease etiology (Echo), CXR, urinalysis, CBC, EKG, cardiac markers, total hours of stay at ED, condition on discharge or admission to ward, the number of years or months on treatment.

4.4 Methods of study

The Echo result done by radiologists, internists, and cardiologists were accepted as reliable result. The CXR comment given by radiologists or decision of a treating physician when the CXR is not commented was respected, so diagnosis of pneumonia was based on CXR comment or clinician's decision to treat for. The diagnosis of UTI was based on clinical presentation of a patient and U/A result. The EKG interpretation of a treating resident was accepted and interpretation was done by the investigator when there was no interpretation. So diagnosis of arrhythmias was based on these EKG reports. The diagnosis of AMI was based on clinical presentation, EKG findings and cardiac markers (15). The diagnosis of anemia was made based on serum hemoglobin level. Discontinuation of heart failure therapy was considered as precipitating factor when there was worsening of symptoms of CHF after discontinuation of the medications as reported by patient. The diagnosis of SBE was made by based on ECHO and blood culture (14). The precipitating factor was considered as not identified when the history, physical examination and investigations did not reveal for common precipitating factors and natural course of the disease was considered as precipitating factor when a treating physician made the diagnosis. The clinical diagnosis of CHF was based on Framingham criteria (14). The diagnosis CRVHD was based on the ECHO result when available or clinician's diagnosis when there was no ECHO. The diagnosis of dilated cardiomyopathy was made based on ECHO result and/or the clinician's diagnosis. The diagnosis of peripartal cardiomyopathy was made based on ECHO and /or clinical diagnosis and history pregnancy and recent delivery. The diagnosis of ischemic heart disease was made based on ECHO. A patient considered to have HHD on the basis of self reported history of hypertension and/or the of blood pressure- lowering medication in addition to the criteria of heart failure as stated above or had documented blood of 140/90 mmHg.

4.5 sample size All patients admitted with the diagnosis of heart failure in the study period.

4.6 Inclusion criteria Patients admitted with the diagnosis of heart failure in the above specified time were included in the study.

4.7 Exclusion criteria Those who had multiple admissions during study period and previously enrolled in the study were identified by chart review in order to avoid duplication of data.

4.8 Data collection and Stastical methods The data were collected by the investigator and entered into SPSS for Windows version 20.0. Descriptive statistics and chi-square were used where appropriate and p-value <0.05 was considered significant.

4.9 Data quality assurance The data quality control measures were undertaken include: pre-testing of data collection tools, and checking completeness and internal consistencies of data.

4.10 Variables

4.10.1 Independent variables

Age, sex, Etiology, precipitating factors, clinical features

4.10.2 Dependent variables (outcome)

Mortality, ED stays, patients condition on disposition

4.11 Operational definitions

- CHF – is a clinical syndrome that occurs in patients who, because of an inherited or acquired abnormality of cardiac structure and /or function, develop a constellation of clinical symptoms (dyspnea and fatigue) and signs (edema and rales) that lead to frequent hospitalizations, a poorer quality of life, and a shortened life expectancy. (15)
- Adult - refers to individuals above the age of 12, which is cut of age for patients to be seen by adult ED physician at TASH.
- Hypotension BP below 90/60mmHg.15
- Low normal BP between 90/60-120/80mmHg.15
- Normal BP between 120/80- 140/90mmHg.15
- Hypertension BP 140/90mmHg and above.15
- Bradycardia PR below 60 beats per minute (bpm). 15
- Tachycardia PR above 100bpm. 15
- Bradypnea RR below 12breaths per minute (bpm). 15
- Tachypnea RR above 20bpm. 15
- Low oxygen saturation less than 90%.15
- Normal oxygen saturation greater than or Equal to 90%. 15
- Severe anemia hemoglobin below 7 mg/dl.15
- Moderate anemia hemoglobin between 7 and 10 mg/dl.15
- Mild anemia hemoglobin of 10 to 15.7 ± 1.7 in adult men and 13.8 ± 1.5 in adult female.1

4.12 Ethical considerations Ethical clearance was obtained from the department of Emergency medicine, Addis Ababa University. Confidentiality was kept during the study and will be kept during dissemination of the result. Written consent was prepared in English and verbal interpretation to their respective mother tongues was done to patients during data collection.

4.13 Dissemination of the results The paper will be submitted to Addis Ababa University, Faculty of Medicine, department of emergency medicine.

Chapter Five

Results

Socio-demographic characteristics

Distribution by sex and age

One hundred and twenty eight patients were admitted to the ED during the study period and among those majority or 75(58.6%) were female and 53(41.4%) were male.

When we come to age of patients 30 (23.4%) of the patients were in the age range of 12-20 years. Thirty four (26.6%) of the patients were in the age range of 20 -29 years, 13(10.1%) were male and 21(16.4%) were female. Sixteen (12.5%) of patients were in the age range of 30 -38 years, only 4(3.1%) were male and 12(9.3%) were female. Fifteen (11.7%) of the patients were in the age range of 39 – 47 years, among those 7(5.4%) were male patients and 8(6.2%) were female. Only seven (5.5%) patients were in the age range of 48-55 years, among those 6 (4.6%) were male and 1(0.8%) was female. Twenty six patients (20.3%) were >55years of age (Table 1).

Age Range	sex		Total
	Male	Female	
12-20Yr	15	15	30 (23.4%)
20-30Yr	13	21	34 (26.6%)
30-39Yr	4	12	16 (12.5%)
39-48yr	7	8	15 (12.5%)
48-55yr	6	1	7 (5.5%)
>55	8	18	26 (20.3%)

Table 1. Distribution of patients by Age and Sex, TASH, AA, Ethiopia, 2014.

Distribution by address of patients

Sixty eight (53.1%) of patients were out of the city of AA, and the rest 60 (46.9%) were from the city.

Distribution by time since diagnosis of CHF

In 45 (35.2%) of patients diagnosis of CHF was made in the last one year, in 30(23.4%) of patients the diagnosis was made in between the last one to three years. In only 13(10.2%) of patients the diagnosis was made in between the last three to five years, and 30(23.4%) of patients the diagnosis was made in between the last five to ten years and the rest 10 (7.8%) of patients the diagnosis was made before ten years (Table 2).

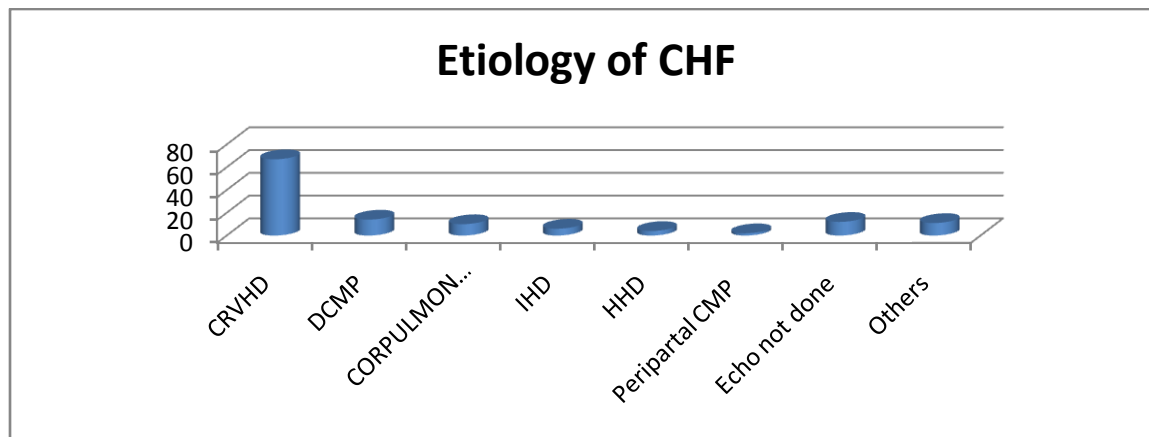
Time of Diagnosis	No. of patients	Percent
Last 1 yr	45	35.2%
1-3yr	30	23.4%
3-5yr	13	10.2%
5-10yr	30	23.4%
>= 10yr	10	7.8%
Total	128	100%

Table 2. Time since Diagnosis of heart diseases, TASH, AA, Ethiopia, 2014.

Etiology of CHF

CRVHD was the most common ECHO finding in 67 (52.3%) of the patients followed by DCMP 14(10.9%). Corpulmonale was an ECHO finding in 10 (7.8%) of the patients, followed by the fourth most common cause of ECHO findings, IHD, 8 (6.3%). HHD was the ECHO finding for 4 (3.1%) followed by peripartal cardiomyopathy, in only 2 (1.6%) patients. Echo was not done for 12 (9.4%) patients and 11(8.6%) of the ECHO findings were others. When we come to the final diagnosis of our patients majority, 65(50.8%) of the patients were diagnosed and managed for CHF secondary to CRVHD, followed by cardiogenic shock 16 (12.5%) and Corpulmonale 12 (9.4%) of our patients. CHF secondary to DCMP and IHD accounted 11 (8.6%) and 6 (4.7%) of the final diagnosis respectively, while only 5 (3.9%) of patients were diagnosed and managed for CHF secondary to HHD. Only one patients was managed for final diagnosis of CHF secondary to peripartal DCMP, while the rest of patients 12 (9.4%) were managed for other etiologies (Figure 1).

Figure 1: Distribution of patients to their etiology based on their Echocardiography findings, ED, TASH, AA, Ethiopia, 2014



Precipitating factors of CHF

The most common precipitating factor identified was pneumonia 46 (35.9%) followed by arrhythmias 29 (22.7%). Third most common precipitating factor was discontinuation of CHF therapy 20 (15.6%) followed by natural course of the disease or refractory CHF in 10 (7.8%) of the patients. Anemia and SBE were each identified as precipitating factors in 8 (6.3%) of our study population. UTI was diagnosed in 5 (3.9%) of patients and thyrotoxicosis in only 3 (2.3%) of the patients. Pregnancy was precipitating factor only 4 (3.1%), where as hypertension and AMI were each considered as precipitating factors in single patients. In 17 (13.3%) of the patients the precipitating factors could not be identified, while other precipitating factors were considered in 4 (3.1%) of the study population (Table 3).

Table 3: Distribution of patients with CHF to their precipitating factors, TASH, AA, Ethiopia, 2014.

NB: Some of the patients had more than one precipitating factor.

Precipitating factor	No. of patients	Percent
Pneumonia	46	30.46%
Arrhythmia	29	19.20%
Non compliance to CHF therapy	20	13.24%
Not identified	17	11.25%
Natural course of the disease	10	6.62%
Anemia	8	5.29%
SBE	8	5.29%
others	6	3.98%
Pregnancy	4	2.64%
Thyrotoxicosis	3	1.98%
Total	151	100%

Variables	Dead		X ² (95%CI)	p-value
	Yes	No		
Sex				
Male	2	2	1	
Female	51	73	0.699 (0.095-5.123)	0.724
BP on admission				
Unrecordable	1	15	1	
Hypotensive	1	14	0.467 (0.038-5.734)	0.552
Low normal	1	15	0.341 (0.653-6.982)	0.999
Normal	1	80	5.333 (0.316-90.027)	0.246
RR on admission				
Tachypnea	2	102	0.373 (0.032-4.317)	0.430
Bradypnea	1	3	0.059 (0.004-0.842)	0.037
Normal	1	19	1	
Oxygen saturation				
Normal	1	89	1	
Low	3	35	0.131 (0.013-1.303)	0.083
final diagnosis*				
RHD	1	63	1	
HHD	1	4	0.063 (0.003-1.213)	0.067
DCMP	1	10	0.159 (0.009-2.747)	0.206
cardiogenic shock	1	15	0.238 (0.014-4.028)	0.320

Table 4: Association of CHF patients to socio-demographic characteristics and clinical profile with mortality, TASH, 2014

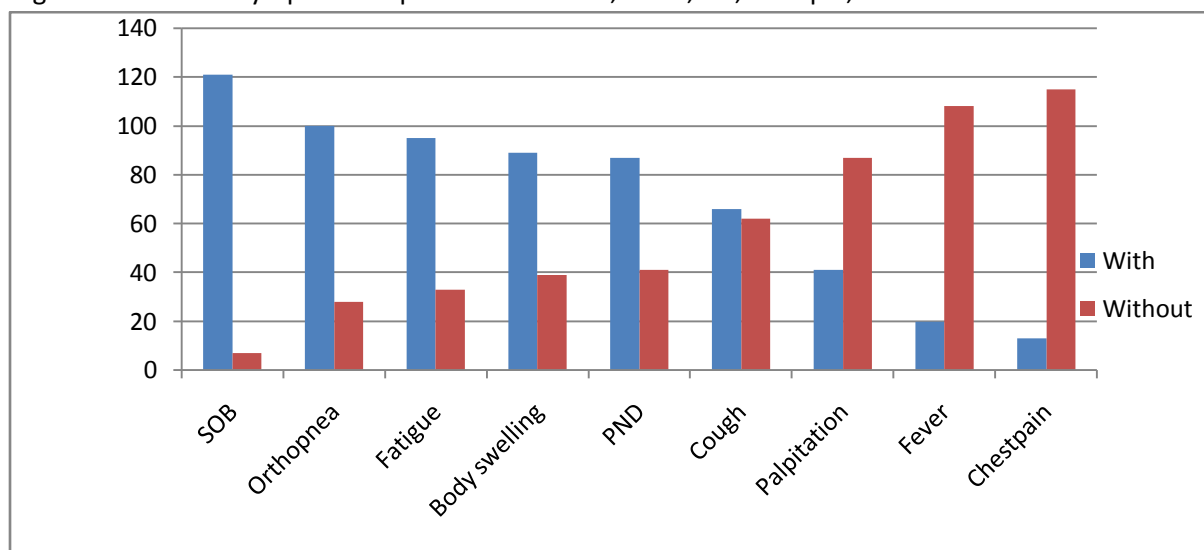
*Final diagnoses with death cases were included.

Majority of the patients were admitted to medical wards 67(52.3%), while 57 (44.5%) were treated at ED and discharged. Four (3.1%) patients were died at the ED (Figure 6). The above table tries to identify the predictors of mortality but there is no statistically significant predictor of mortality identified (Table 4).

Common symptoms of CHF up on presentation to ED

One hundred and twenty one (94.5%) of patients were reported that they had SOB up on presentation to the ED, while only 7(5.5%) of did not have SOB. Orthopnea was reported by 100 (78.1%). Fatigue was reported by 95 (74.2%) of our patients, while 33 (25.8%) of patients did not. Body swelling was reported by 89 (69.5%) of patients. Eighty seven (68%) of the patients were reported that they had PND, while 41 (32%) did not. Sixty six (51.6%) of patients had cough up on presentation to the ED, while the rest or 62 (48.4%) of patients did not have cough. Fourty one (32%) of patients had palpitation, while 87 (68%) of patients did not complain about the presence of palpitation. Fever is reported by 20 (15.6%) of patients, while the rest 108 (84.4%) of patients did not. Only 13 (10.2%) of patients had chest pain. (Figure 2).

Figure 2: Common symptoms of patients with CHF, TASH, AA, Ethiopia, 2014.



Vital signs on admission of CHF patients

Eighty one (63.3%) of the patients were admitted with normal BP, while only 15 (11.7%) of patients were hypotensive and 16 (12.5%) of our patients had unrecordable BP. Fifteen (11.7%) of patients had low normal BP and only 1 (0.8%) patient had the BP recorded within hypertensive range. Eighty nine (69.5%) of the patients were tachycardic, while 37 (28.9%) of the had normal PR. Only two (1.6%) of the patients were bradycardic.

One hundred and four (81.3%) of the patients were tachypnic while twenty (15.6%) had normal RR. Only four (3.1%) of our patients were bradypenic. Twenty Four (18.8%) of the patients were febrile while 104 (81.3%) were not. Ninety (70.3%) of the patients were not desaturating on initial evaluation. (Table 5).

Table 5: Distribution of patients who admitted with CHF to their vital signs, TASH, AA, Ethiopia, 2014.

Vital sign		No. of patients	percent
BP	Normal	81	63.3%
	Unrecordable	16	12.5%
	Low normal	15	11.5%
	Hypotension	15	11.5%
	hypertensive	1	0.8%
PR	Tachycardic	89	69.5%
	Normal	37	28.9%
	Bradycadic	2	1.6%
RR	Tachypnea	104	81.3%
	Normal	20	15.6%
	Bradypnea	4	3.1%
Temperature	Febrile	24	18.8%
	ATT	124	81.2%
Saturation	Normal	90	70.3%
	Low	38	29.7%

Distribution of patients to their physical examination findings

Forty six (35.9%) of the patients had rales on chest examination, while only 26 (21.9%) of the patients did not reveal any abnormality on chest examination. Twenty three (18.0%), 11(8.6%), 39(30.5%) of the patients had dullness, absent air entry, and decreased air entry respectively on chest examination. Only 8(6.3%) of the patients had bronchial breath sounds. On CVS examination 93 (72.7%), 53(41.4%), 12(9.4%), and 13(10.2%) of our patients had murmur, raised JVP, S3 gallop and irregular heart sounds respectively. Only 7(5.5%) of patients had other physical findings on CVS examination. Abdominal examination revealed hepatomegaly in 49(38.3%) of our patients while 61(47.7%) of our patients had normal abdominal examination. Twenty (15.6%) and 1(.8%) had ascites and jaundice respectively, while only 2(1.6%) patients had other physical findings on abdominal examination. Peripheral edema was physical finding in majority of our patients, i.e. 99(77.3%).

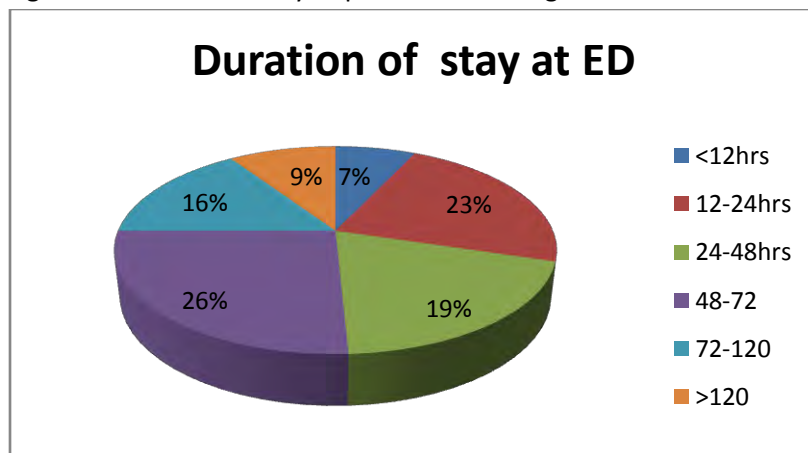
Patients' compliance to CHF therapy

One hundred and five patients (82%) were compliant to heart failure therapy while 23 (18%) were not. Among those who were not compliant to the therapy 15 (65.2%) patients were discontinued their CHF therapy for more than a week, while 8 (34.8%) of them for less than a week. Among those who discontinued their CHF therapy for less than a week only 2 (8.6%) patients presented to the ED within 48 hours, 4 (17.3%) of them in the next three to five days and the rest 2 (8.6%) on the sixth and seventh days.

Distribution of patients to total period of stay at ED

Only 9 (7.0%) of patients were disposed from the ED within 12 hours of ED admission, and 29 (22.7%) of the patients were disposed from the ED with 12 to 24 hours. Twenty five (19.5%) of patients were disposed within 24 to 48 hours. Thirty three (25.8%) of the patients were disposed within 48 to 72 hours. Twenty (15.6 %) of the patients stayed for 72 to 120 hours and the rest of patients stayed in the ED for at least five days, 12 (9.4%) (Figure4).

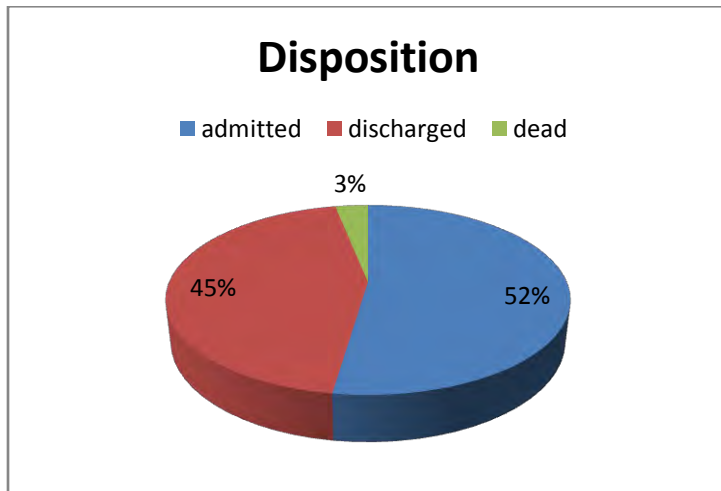
Figure 3: Duration of stay of patients with diagnosis of CHF at ED of TASH, AA, Ethiopia 2014.



Distribution of the patients conditions on admission to medical wards or on discharge from the ED.

Seventy three (57%) of our patients were improved or improving while they were disposed from the ED and 49 (38.5%) of the patients were disposed while they were in the same condition. Four (3.1%) of the patients were died at the ED and 1 (0.8%) patient was deteriorating on admission.

Figure 4: Distribution of patients who were admitted with CHF to their disposition, ED, TASH, AA, Ethiopia, 2014.



Distribution of patients to laboratory and imaging results

Eighty nine (69.5%) of our patients had normal hemoglobin, while 11(8.6%) of our patients CBC revealed mild and moderate anemia each. Only 7 (5.5%) of our patients had severe anemia and for ten (7.8%) of our patients CBC was not done while they are at our ED. About one third of U/A 48(37.5%) results were non- revealing.

Only 8 (6.3%) of patients had findings consistent with UTI, while 4 (3.1%) of the patients had findings consistent with IE. For 68 (53.1%) of the patients U/A was not done while the patients were in the ED. Tachyarrhythmia was an EKG finding in 31 (24.2%) of our patients, while bradyarrhythmia was an EKG finding in only 2 (1.6%) of our patients. Sinus tachycardia, sinus bradycardia and normal sinus rhythm were EKG findings in 24 (18.8%), 1(.8%) and 10 (7.8%) of the patients respectively. For 55(43.0%) of our patients EKG was not done, where as 5(3.9%) of the patients had other EKG findings. Cardiomegaly, consolidation, pulmonary edema, and parapneumonic effusion were reported in 35 (27.3%), 13 (10.2%), 13 (10.2%) and 10 (7.8%) of CXR of our patients respectively. Transudative effusion was considered in 16 (12.5%) of our patients, while 6 (4.7%) of the patients had other CXR findings and for 55 (43.0%) of the patients CXR was not taken. Cardiac markers were done for only 6 patients (4.7%) among that there was only one positive or significantly high result, while for the rest of 122(95.3%) patients cardiac enzymes were not done

Chapter Six

Discussion

CHF is an important cardiovascular event that is increasing in incidence and prevalence worldwide. CHF is a common and severe condition in Africa; it remains the commonest complication of hypertension and cardiomyopathy in some African countries. (2, 16)

This study was carried out to assess pattern of CHF at TASH Emergency Department, AA, Ethiopia. The leading causes for CHF on echocardiography findings were, CRVHD 67 (52.3%) of the patients followed by DCMP 14(10.9%), Corpulmonale 10 (7.8%) , IHD, 8 (6.3%). HHD was the ECHO finding in 4 (3.1%) followed by peripartal cardiomyopathy, in only 2 patients. This is consistent with other study done at the same setting on 338 patients which reported RHD in 152 patients, HHD in 47 patients and cardiomyopathy in 39 patients, except HHD which is not common cause of CHF in this study (11). Similar study from Gondar College of Medical science, cardiac clinic, Gondar, Ethiopia on 474 patients between 1985 and 1988 showed RHD (42%) to be the commonest cause of cardiovascular disease followed by hypertension (38.1%) (8). Other studies which were done in different sub Saharan Africa countries, Nigeria and other hospitals of Ethiopia showed hypertension as common cause of heart disease and CHF. (1, 3, 16).

This study population may not represent all cardiac patients visiting the hospital, because the patients who visited our ED with diagnosis of CHF were possibly patients who had underlying etiology with significant morbidity and mortality, when compared to those who were seen at referral clinics, So this might have contributed to lower proportion of HHD (3.9%) in this study (1,16).

The higher proportion of CRVHD (52.3%) in this study was consistent with study which was done in the same hospital by Oli k et al, which was done in medical wards of TASH to evaluate severity of RHD, which accounted the significant share of mortality 121(26.5%) of patients who died of cardiovascular causes including cerebrovascular accidents (4).

And also the study was consistent with this study by the proportion of female patients,(57.4%) which is comparable to ours(58.6%) (7).

The mortality was lower in this study 4(3.1%) when compared with Nigerian study which was 4.3 %.(6) This study identified other important cause of CHF which was Corpulmonale 10 (7.8%) in addition to CRVHD, giving rise to additional burden on the top of CRVHD. This result was consistent with study done at the same setting on causes of Corpulmonale on Fourty two patients which showed the most common causes to be bronchial asthma(36%) followed by chronic fibrocavitary tuberculosis(17).

When we come to age of patients who developed CHF, 64 (50%) were below the age of 30 years, which means CHF was debilitating illness for young and most productive age groups. This was well reflected in other Studies which showed mean ages at development of cardiovascular disease that is 23 years in Gondar, 25.5 years in Tikur Anbessa Hospital and 31 years in Jima (2)

Though there were no adequate literatures to compare the following results this study has revealed important clinical presentation of patients with CHF. i.e

SOB was the commonest symptom for patients with CHF, 121 (94.5%) followed by orthopnea, fatigue, body swelling, PND, cough, palpitation, fever and chest pain were 78%, 74.2%, 69.5%, 68%, 51.6%, 32%,15.6% and 10.2% of our patients respectively.

On physical examination 63.3% of our patients had normal BP, while only 15 (11.7%) of patients were hypotensive. Tachypnea was the most common sign, documented in 81.3% of our patients. Eighty nine (69.5%) of our patients were tachycardic. Fever was not documented in majority of patients, while only 29.7% of our patients were desaturating on admission to ED. Murmurs (72.7%) were the most common CVS finding followed by raised JVP (41.4%). Rales was reported in 35.9% and that of edema and hepatomegaly 77.3% and 38.3% respectively. Eighteen percent of our patients were not compliant to their heart failure (HF) therapy.

Less than one third of our patients (29.7%) were disposed from ED within 24 hours of ED admission, and one fourth of patients stayed at ED for at least 72 hours.

Only seven (5.5%) of patients had severe anemia. Tachyarrhythmia was an EKG finding in 31 (24.2%) of our patients, but this figure may not be true because EKG was not done for majority of patients 55 (43%). For the same reason the results of other laboratory and imaging results may not revealed true figures. For example

Cardiomegaly was the most common CXR finding in this study (27.3%) but for 43 percent of our patients CXR was not taken while they were at ED.

The most common precipitating factors was pneumonia 46 (35.9%) of our patients followed by arrhythmias (22.7%) and non compliance to HF therapy, 20 (15.3%). Anemia and SBE each accounted for 6.3% of the precipitating factors. UTI was the precipitating factor only in 3.9% of patients, but this could be due to under diagnosis at ED, because for 68 (53.1%) of our patients U/A was not done.

Conclusion and recommendations:

The most common cause of CHF at ED,TASH, Addis Ababa University, AA, Ethiopia is CRVHD, which accounts for more than fifty percent of the causes, followed by DCMP and Corpulmonale. Hypertension is not common cause of CHF in this study as it was seen in other studies. To seek for possible explanation for the gap in the findings other studies with larger sample sizes need to be done in the in patient and out patient departments.

CHF is more common in females than in males. More than half of patients stayed at ED for at least 48 Hours, so the hospital should improve the use of inpatient beds and turn over time of laboratory and imaging results.

The most common precipitating factor for CHF is pneumonia which is followed by arrhythmias and non compliance to CHF therapy which indicates a gap in addressing compliance. Hence patient health education on compliance should be core part of patient care .

AMI was not common precipitating factor in this study as most patients didn't have ECG and cardiac markers. Cardiac markers and EKG which help to determine the prevalence of AMI should be readily available in the hospital. Concerned body should focus on prevention, diagnosis and treatment of CRVHD and its precipitating factors.

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Questionnaire

To be filled by investigator by reviewing charts of patients and partly asking (for incomplete documentation) patients in ED of TASH with heart failure to determine common causes of HF, common precipitating factors, ED stay and mortality. We believe that knowing this basic information is mandatory to launch successful prevention programs in the country. Your participation is very crucial to this study. Thank you for participating!

Name C.No.....

Age 1) 12 -20 2) 20 -30 3) 30-39 4) 39- 48 5) 48-55 6) >55

sex 1) M 2) F

Date of exam(admission).....

Address 1. Addis Ababa 2. Out of Addis

1) Time since CHF diagnosed (years) 1) < one year 2) 1- 3 years 3) 3- 5 years 4) 5-10 years 5) > 10 years

2) Common symptoms of presentation to ED

1) Shortness of breath 2) Cough 3) Orthopnea 4) PND

5) Chest pain 6) Palpitation 7) Fever 8) Body swelling 9) Fatigue

3) Did the patient discontinue her/his HF medication prior to the current admission? 1, Yes 2, No

4) If Yes for how many days 1) < 2 days 2) 2 to 5 days 3) 5 to 7 days 4) > 7 days

5) Total period of stay at ED 1) <12 hours 2) 12 to 24 hours 3) 24 to 48 hours 4) 48 to 72 hours

5) 72 to 120 hours 6) > 120 hours

6) Condition of the patient on admission to ward or Discharge from ED a) improved or improving b) the same c) deteriorating d) Dead

V/S

7) BP 1) Unrecordable 2) Hypotension 3) Low Normal 4) Normal 5) Hypertension

8) PR 1) Tachycardic 2) Bradycardia 3) Normal

9) RR 1) Tachypnea 2) Bradypnea 3) Normal

10) T 1) Febrile 2) Afebrile to touch

11) PSO₂ 1) normal 2) Low

12) RS 1) Rales or Crackles 2) dullness 3) Absent air entry 4) Decreased air entry 5) Normal

6) BBS 7) Others

13) CVS 1) Raised JVP 2) Murmur 3) S3 Gallop 4) irregular heart sounds 5) Others.....

14) Abdomen 1) Hepatomegaly 2) Ascites 3) Jaundice 4) Normal 5) others

15) Mss. Edema 1) yes 2) no

Investigations

16) Hgb 1) Mild anemia 2) Moderate anemia 3) severe Anemia 4) Normal 5) Not done

17) U/A 1) findings consistent with UTI 2) findings consistent with infective endocarditis 3) Non revealing 4) not done

18) EKG 1) Sinus tachycardia 2) Sinus bradycardia 3) normal sinus rhythm 4) Tachyarrhythmia 5) Bradyarrhythmia 6) others 7) not done

19) CXR 1) Consolidation 2) parapneumonic effusion 3) pulmonary edema 4) Transudative (HF related) effusion 5) Cardiomegaly 6) others 7) Not taken

20) Cardiac markers 1) Negative or low 2) positive or significantly high 3) not done

21) Echo result 1) Rheumatic heart disease 2) Hypertensive heart disease 3) Dilated cardiomyopathy 4) Peripartal cardiomyopathy 5) ischemic heart disease 6) Cor pulmonale 7) Others 8) Not done

22) Final diagnosis CHF secondary to 1) Rheumatic heart disease 2) Hypertensive heart disease 3) dilated cardiomyopathy 4) peripartal Cardiomyopathy 5) Ischemic heart disease 6) Cor pulmonale 7) Cardiogenic Shock 8) others

23) precipitating factor/s/ 1) Pneumonia 2) UTI 3) Other infectious diseases 4) Arrhythmias 5) pregnancy 6) Hypertension 7) AMI 8) Thyrotoxicosis 9) Anemia 10) discontinuation of HF therapy 11) Not identified 12) natural course of the disease 13) Infective Endocarditic(SBE) 14) others

24) Disposition 1) Admitted 2) Discharged 3) Dead 4) Referred

25) Dead 1) Yes 2) No