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Review



A Prospective Observational Study On Effect Of Diuretics In Patients With Cardiovascular Diseases

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	<p>Abstract</p>
<p>Published on: 12 May 2025</p>	<p>The purpose of our study was to perform a combined analysis of prospective study of diuretics to evaluate the safety and efficacy of the diuretics prescribed in our study. To understand the mechanism of diuretic drugs and statin, to evaluate the use of diuretics, to find the best diuretic drug according to the clinical indications and to formulate future treatment guidelines and protocol.</p>
<p>Published by: DrSriram Publications</p>	<p>METHOD: 120 cases were collected, and the data collection form will be prepared and used. This form mainly contains the demographic details of the patients and medication chart. All information relevant to the study was collected from outpatient as well as inpatient department from the time of admission till the date of discharge after taking consent from patient.</p>
<p>2025 All rights reserved.</p>  <p>Creative Commons Attribution 4.0 International License.</p>	<p>RESULT: A total of 120 cases of cardiovascular diseases were observed. Majority of the cases were males (73%) compared to females (27%). Most of them were between the age group of 41-50 years (27%). Hypertension (85%), coronary artery disease (81%) and Diabetes Mellitus (DM) (76%) were the most common comorbidities. Our analysis shows that (20%) are vegetarian and (80%) are non-vegetarian. Analyzing the patient report, it was noticed that Aspirin (92%), Metoprolol (89%), Atorvastatin (85%), Cilnidipine (83%), and Clopidogrel (80%) were the most widely prescribed medications whereas the most widely prescribed Diuretic was Hydrochlorothiazide (60%), Furosemide (45%), and Spironolactone (25%).</p>
	<p>Keywords: Cardiovascular Disease, Atrial Fibrillation, Hypertension Coronary Artery Disease, Ischemic Heart Disease, Stroke, Patient Counselling.</p>

INTRODUCTION

Cardiovascular disease (CVD) refers to a group of disorders that affect the Cardiovascular System comprising of heart, blood as well as blood vessels, such as Atrial Fibrillation, Coronary Artery Disease, Stroke, Congestive Heart Failure etc. CVD is the most prominent cause of death around the world. They stand as a pervasive global health challenge, representing a significant cause of mortality and morbidity. The cardiovascular system is an intricate

arrangement of blood vessels and organs that transport hormones, nutrition, oxygen, and waste components within the body. This intricate system is important to maintain homeostasis and also support the body's physiological functions.

Types Of Cardiovascular Diseases

Cardiovascular diseases (CVDs) is collective term used for range of diseases that affect the heart, blood and blood vessels, leading to impaired function. Here is an overview of some of the most frequent types of cardiovascular diseases:

- Coronary Artery Disease (CAD)
- Hypertension
- Congestive Heart Failure (CHF)
- Stroke

Role Of Diuretics In The Pharmacological Treatment Of Cardiovascular Diseases

Diuretics are the first-line medications used in the treatment of volume overload, and their goal is to establish a negative sodium and hence fluid balance. They are most frequently referred to as water pills. Diuretics stimulate urine output and promote the removal of excess salt and water from the body. They have a crucial role in the management of various conditions, most primarily cardiovascular diseases and Edema.

Methodology

Materials and method

This is a prospective and observational study where eligible patients are enrolled into the study. The data collection form was prepared and used. This form mainly contains the demographic details of the patients and medication chart. The study was conducted on the Therapeutic management of cardiovascular diseases using diuretics at Tertiary Hospital, the duration of the study was 6 months. All information relevant to the study was collected from outpatient as well as inpatient department from the time of admission till the date of discharge after taking consent from patient.

Inclusion Criteria

- Inpatients and Outpatients of Cardiology department diagnosed with cardiovascular Diseases and other Comorbid conditions.
- Patients between the age of 18-70 years.

Exclusion Criteria

- Patients who aren't willing to give consent.
- Patients with cognitive impairment.
- Patients with Psychiatric Disorders.
- Pregnant C Lactating Women are not included.

Study procedure

This is a prospective observational study in which patients who meet the eligibility criteria are enrolled after providing consent. A data collection form and questionnaire will be created and used. This form mostly contains the patient's demographic information and a medication chart. In addition, a booklet is developed to educate the patient about the potential effects of this disease. The study will be carried out at CARE Hospital. All relevant study information will be collected from the moment of admission until discharge, and the data will be analyzed using a competent statistical method.

RESULTS

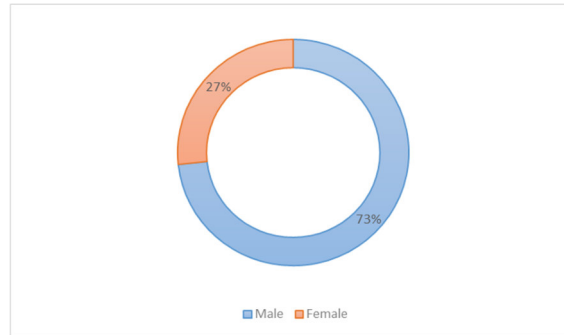
The analysis of prospective study includes 120 cases. Which was collected considering the exclusion and inclusion criteria. The results were found, out of sample cases the individuals diagnosed with CVD were distributed among male and females, the majority of cases were in males 73% and the remaining 27% in females. Out Of the 120 patients studied, 60% were prescribed Hydrochlorothiazide, 45% patients were prescribed Furosemide and 26% were prescribed with Spironolactone. Based on the body mass index (BMI), we found that the majority of cases were of overweight 49%, followed by 33% normal weight. By seeking more information, we learned that the majority of cases were in obese patients. With a sample size of 120 in the unit many of the patients were also diagnosed with comorbidity, such as hypertension 85%, coronary artery disease 81% and diabetes mellitus 76%. It was estimated from the patient's habits that 28 (18%) were smokers, 26 (16%) were alcoholics compared to the study where 10.4% patients had smoking habits, 54.8% were non-smokers and 34.8% were past smokers.

The Prevalence Of Cardiovascular Diseases Pertaining To Gender

Table 1: Distribution of the study population based on gender

GENDER	NO. OF PATIENTS
MALE	88 (73%)
FEMALE	32 (27%)

Pie diagram of distribution of the study population based on gender



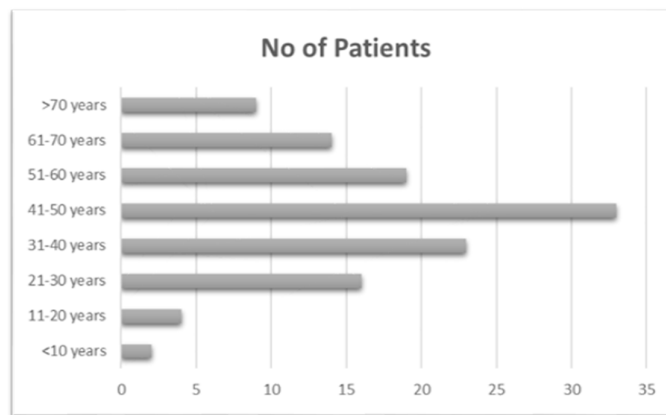
Results: With a sample size of 120 were collected and assessed among which, 88 (73%) were male, and 32 (27%) were female.

Age group wise distribution of cases

Table 2: Distribution of the study population based on age

Age group	<10 years	11-20 years	21-30 years	31-40 years	41-50 years	51-60 years	61-70 years	71-80 years
No.of pts	2(2%)	4(3%)	16(13%)	23(19%)	33(27%)	19(16%)	14(12%)	9(8%)

Bar graph of age wise distribution of cases.



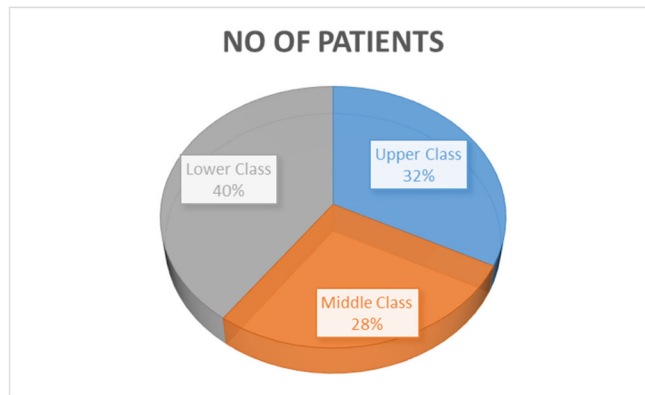
Results: Gathered and evaluated a total of 120 cases in which, 2 (2%) belonged to the < 10 years of age category; 4 (3%) were between the range of 11-20 years of age; 16 (13%) were between 21-30 years of age; 23 (19%) were between 31-40 years of age; 33 (27%) were. Between 41-50 years of age; 19 (16%) were between 51-60 years of age; 14 (12%) were between the range of 61-70 years of age; 9 (8%) belonged to the > 70 years of age category. This research reveals that individuals between the age group of 41-50 years are mainly affected by cardiovascular diseases.

Distribution of cases based on the socio-economic data

Table 3: Distribution of cases based on the socio-economic data

O ECONOMIC DATA	NO. OF PATIENTS
UPPER CLASS	39 (32%)
MIDDLE CLASS	33 (28%)
LOWER CLASS	48 (40%)

Pie chart of socio-economic data distribution



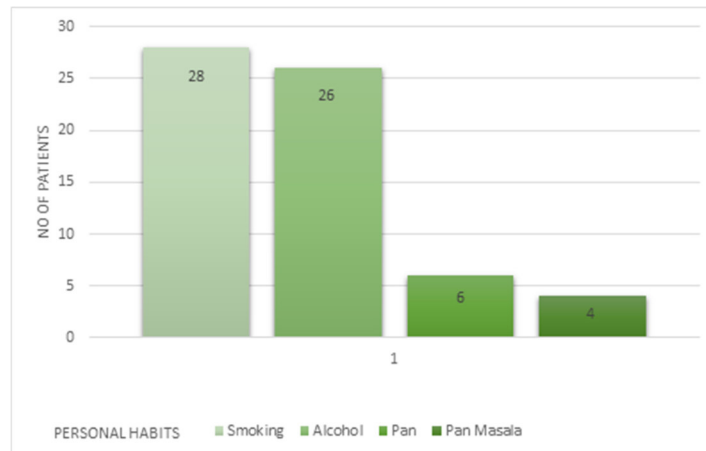
Result: A total of 120 cases were reported; 39 (32%) belong to the upper-class group; 33 (28%) belong to the middle-class group; 48 (40%) belong to the lower-class group. The majority of patients were in the lower-class community.

Distribution of cases based on personal habits of the patient

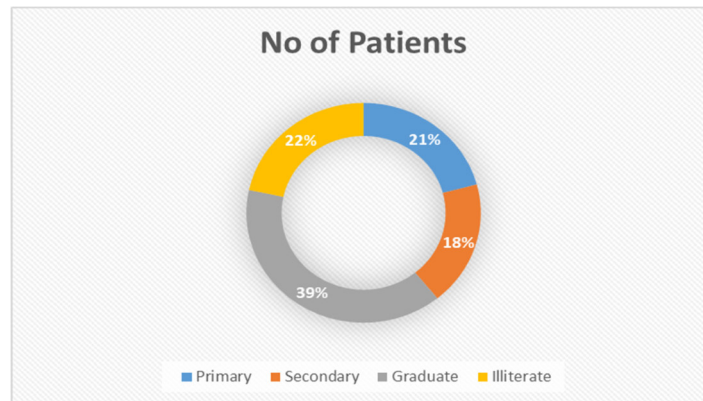
Table 4: Distribution of cases based on personal habits of the patient

PERSONAL HABITS	NO. OF PATIENTS
SMOKING	28 (18%)
ALCOHOL	26 (16%)
PAN	6 (4%)
PAN MASALA	4 (3%)

Bar graph on distribution of cases based on personal habits of patients



Results: Total 120 cases were recorded, of which 28 (18%) were Smokers, 26 (16%) were Alcoholics, 6 (4%) consumed Pan and 4 (3%) consumed Pan Masala.

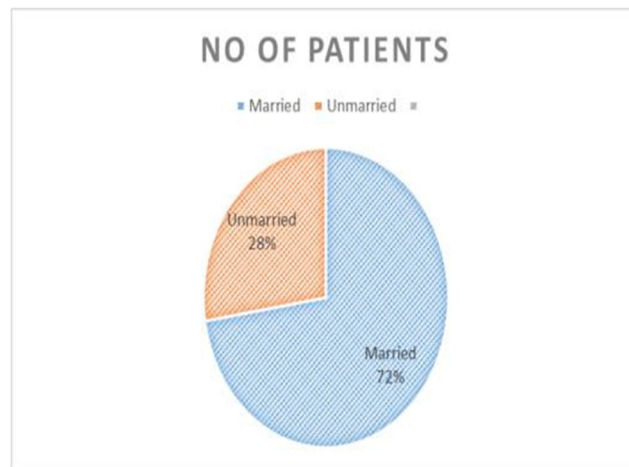


Cases distribution based on the marital status of the patient

Table 5: Cases distribution based on the marital status of the patient

MARITAL STATUS	NO OF PATIENTS
MARRIED	87 (72%)
UNMARRIED	33 (28%)

Pie chart on Cases distribution based on the marital status of the patient



Results: Among 120 collected cases, 87 (72%) were Married and 33 (28%) were Unmarried.

Distribution of cases based on their level of education

Table 6: Distribution of cases based on the level of education of the patient

Level of education	Primary education	Secondary education	Graduate	Illiterate
No. of patients	25(21%)	22(18%)	47(39%)	26(22%)

Illustration Of Case Distribution Based On Literacy

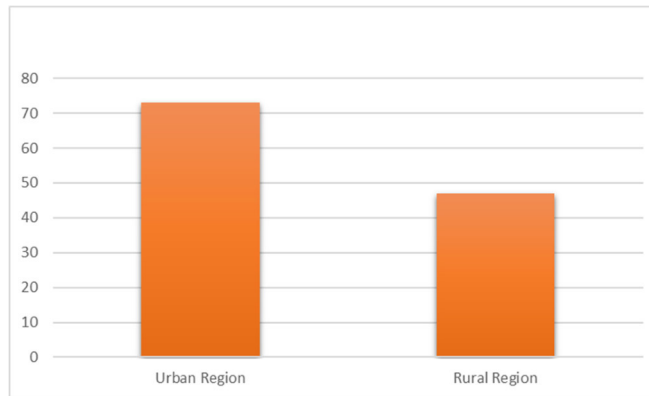
Results: A total of 120 cases were collected and assessed among which, 25 (21%) had completed their Primary Education, 22 (18%) had completed their Secondary Education, 47 (39%) were Graduates and 26 (22%) were Illiterates.

Disposition of the cases related to the residential area of the patient

Table 7: Disposition of the cases related to the residential area of the patients

AREA OF RESIDENCY	NO OF PATIENTS
URBAN REGION	73 (39%)
URAL REGION	47 (61%)

Graph on disposition of the cases related to the residential area of the patients



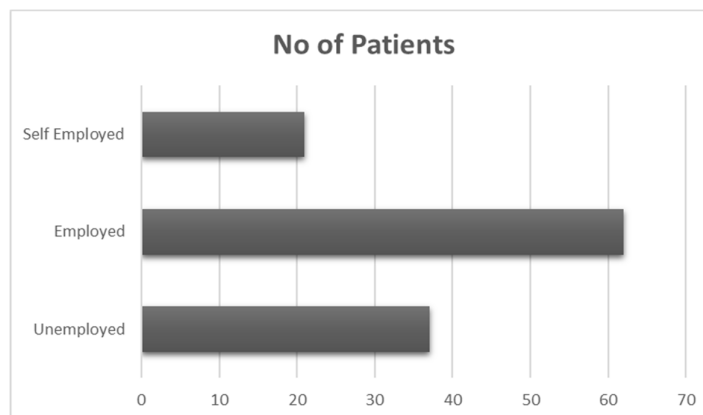
Results: Out of the 120 patients in our research, 73 (39%) reside in the Urban Area, and 47 (61%) reside in the Rural Area. We concluded from this analysis that people living in urban areas are more susceptible to cardiovascular diseases.

Distribution of cases based on their occupation

Table 8: Distribution of cases based on their occupation

OCCUPATION	NO OF PATIENTS
UNEMPLOYED	37 (30%)
EMPLOYED	62 (56%)
SELF EMPLOYED	21 (14%)

Graph on distribution of cases based on their occupation



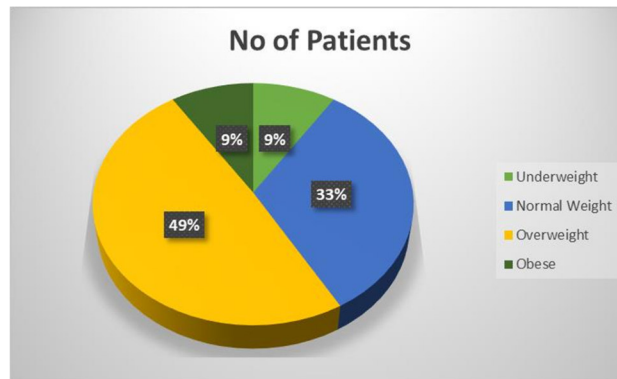
Results: A total of 120 cases were collected, of which 37 (30%) were unemployed, 62 (56%) were employed and 21 (14%) were self-employed.

The prevalence of cardiovascular diseases pertaining to the body mass index (bmi) of the patient

Table 9: The prevalence of cardiovascular diseases pertaining to the body mass index (BMI) of the patient

Body mass Index	Under weight	Normal weight	Overweight	Obese
No.of pts	11(9%)	39(33%)	59(49%)	11(9%)

Pie chart on the prevalence of cardiovascular diseases pertaining to the body mass index (BMI) of the patient



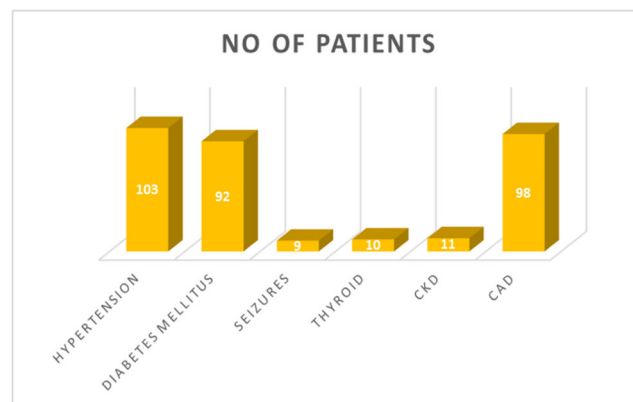
Results: Gathered and evaluated a total of 120 cases in which 11 (9%) underweight, 39 (33%) overweight, 59 (49%) overweight, and 11 (9%) obese patients were found.

The prevalence of cardiovascular diseases according to the pre- existing comorbidities

Table 10: The prevalence of cardiovascular diseases according to the pre-existing Comorbidities

Pre- existing commorbidities	Hypertension	Diabetes mellitus	Seizures	Thyroid disorders	Chronic kidney disease	Coronary artery disease
No.of pts	103(85%)	92(76%)	9(7%)	10(8%)	11(9%)	98(18%)

Graph on the prevalence of cardiovascular diseases according to the pre-existing comorbidities



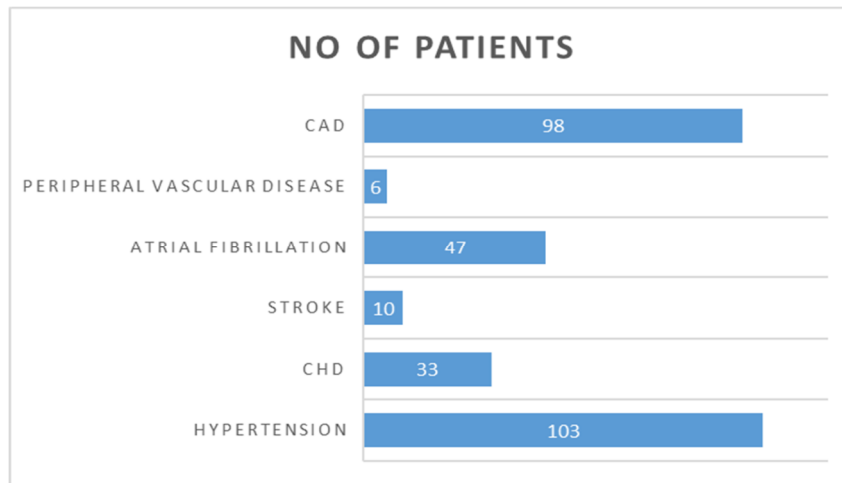
Result: Recorded a total of 120 cases in which, 103 (85%) had Hypertension, 92 (76%) Diabetes Mellitus, 9 (7%) had Seizures, 10 (8%) had Thyroid Disorders, 11 (9%) had chronic kidney disease and 98 (81%) had coronary artery disease.

Case distribution according to the type of cardiovascular diseases

Table 11: Case distribution according to the type of cardiovascular diseases

Pre-existing comorbidities	Hypertension	CAD	CHD	Stroke	Atrial Fibrillation	Peripheral Vascular disease
No.of pts	103(85%)	98(81%)	33(27%)	10(8%)	47(39%)	6(5%)

Bar graph on case distribution according to the type of cardiovascular diseases



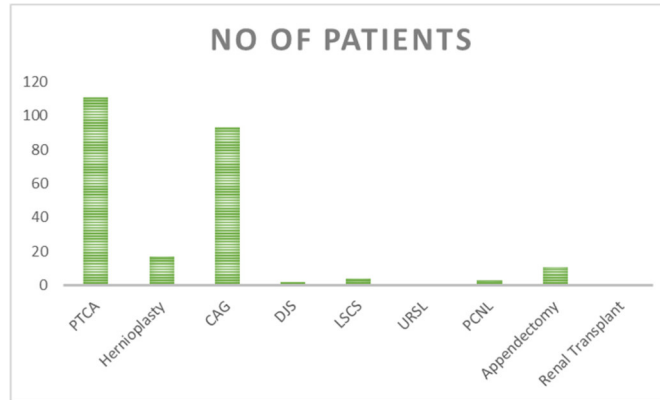
Results: Recorded a total of 120 cases in which, 103 (85%) had Hypertension, 98 (81%) coronary artery disease (CAD), 33 (27%) had CHD, 10 (8%) had Stroke, 47 (39%) had Atrial Fibrillation and 6 (5%) had Peripheral Vascular Disease.

Case disposition related to the surgical history of the patients with cardiovascular diseases

Table 12: Case disposition related to the surgical history of the patients with cardiovascular diseases

SURGICAL HISTORY	NO OF PATIENTS
nsluminal Coronary Angioplasty (Ptca)	111 (92%)
Hernioplasty	17 (14%)
Coronary Angiography (Cag)	93 (77%)
Double J Stent (Djs)	2 (1%)
Lower Segment Cesarian Section (Lscs)	4 (3%)
Ureteroscopic Lithotripsy (Ursl)	1 (1%)
Percutaneous Nephrolithotomy (Pcnl)	3 (2%)
Appendectomy	11 (9%)
Renal Transplant	1 (1%)

Bar graph on case disposition related to the surgical history of the patients with cardiovascular diseases.



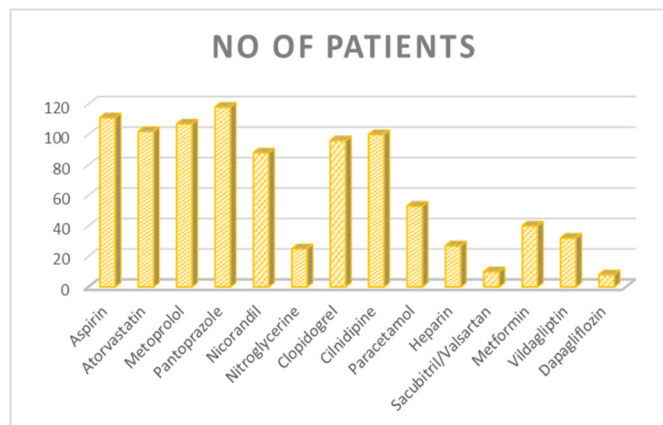
Results: Among 120 patients, 111 (92%) underwent PTCA, 17 (14%). underwent Hernioplasty, 93 (77%) underwent CAG, 2 (1%) underwent DJS, 4 (3%) underwent LSCS, 1 (1%) underwent URSL, 3 (2%) underwent PCNL, 11 (9%) underwent Appendectomy, and 1(1%) underwent Renal Transplant.

Distributions of cases pertaining to thepharmacological management of cardiovascular diseases

Table 13: Distribution of cases based on the medications received by the patients for the treatment of cardiovascular diseases

Medication	NO. OF PATIENTS
Aspirin	111 (92%)
Atorvastatin	102 (85%)
Metoprolol	107 (89%)
Pantoprazole	118 (98%)
Nicorandil	88 (73%)
Nitroglycerine	25 (20%)
Clopidogrel	96 (80%)
Cilnidipine	100 (83%)
Paracetamol	53 (44%)
Heparin	27 (22%)
Sacubitril/Valsartan	10 (8%)
Metformin	40 (33%)
Vildagliptin	32 (26%)
Dapagliflozin	8 (6%)

Bar graph on Distribution of cases based on the medications received by the patients for the treatment of cardiovascular diseases



Results: A total of 120 cases have been gathered and among those 120 patients, 111 (92%) patients received

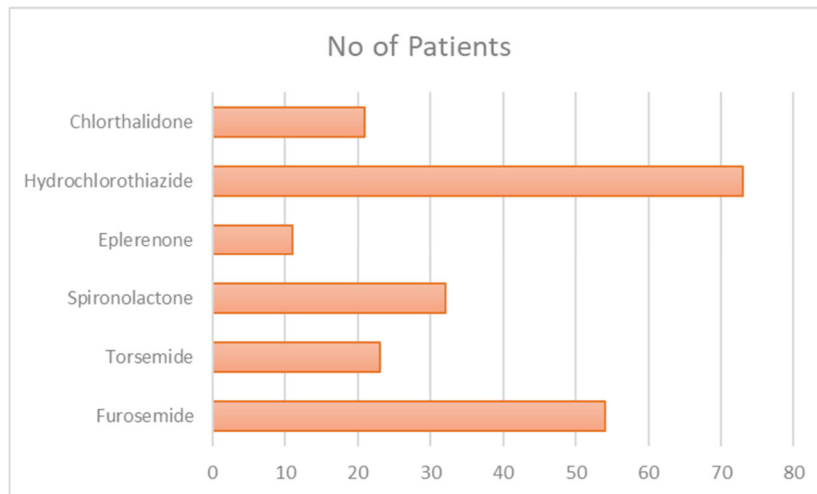
Aspirin, 102 (85%) received Atorvastatin, 107 (89%) received Metoprolol, 118 (98%) received Pantoprazole, 88 (73%) received Nicorandil, 25 (20%) received Nitroglycerine, 96 (80%) received Clopidogrel, 100 (83%) received Cilnidipine, 53 (44%) Received Paracetamol, 27 (22%) received Heparin, 10 (8%) received a combination of Sacubitril and Valsartan, 40 (33%) received Metformin, 32 (26%) received Vildagliptin, and 8 (6%) patients received Dapagliflozin.

Distribution of cases pertaining to the type of diuretic used

Table 14: Distribution of cases based on the type of diuretic used

MEDICATION	NO. OF PATIENTS
FUROSEMIDE	54 (45%)
TORSEMIDE	23 (19%)
SPIRONOLACTONE	32 (26%)
EPLERENONE	11 (9%)
HYDROCHLOROTHAZIDE	73 (60%)
CHLORTHALIDONE	21 (17%)

Bar graph on distribution of cases based on the type of diuretic used



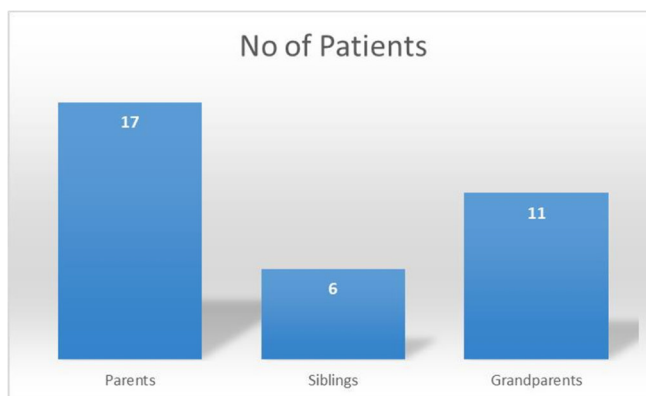
Results: A total of 120 cases have been gathered and among those 120 patients, 54 (45%) patients received Furosemide, 23 (19%) received Torsemide, 32 (26%) received Spironolactone, and 11 (9%) patients received Eplerenone.

Distributions of cases pertaining to the family history of cardiovascular diseases

Table 15: Distribution of cases pertaining to the family history of cardiovascular diseases

FAMILY HISTORY	NO. OF PATIENTS
PARENTS	17 (14%)
SIBLINGS	6 (5%)
GRANDPARENTS	11 (9%)

Bar graph on distribution of cases pertaining to the family history of cardiovascular diseases



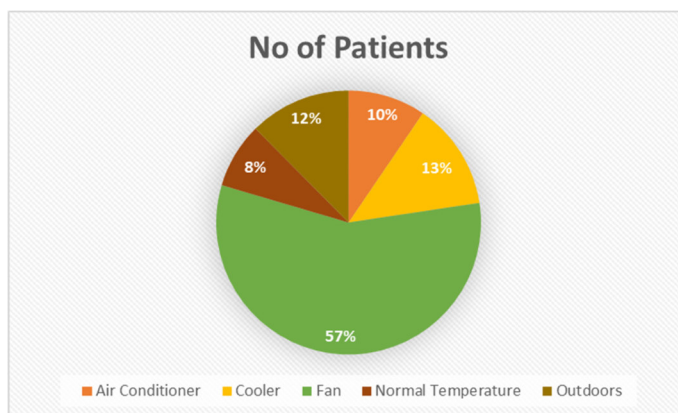
Results: Gathered and evaluated 120 cases out of which, 17 (14%) patient's Parents, 6 (5%) patient's Siblings had; 11 (9%) patient's Grandparents had a history of cardiovascular disease.

Distributions of cases pertaining to the living environment of patients with cardiovascular diseases

Table 16: Distribution of cases based on the living environment

LIVING ENVIRONMENT	NO. OF PATIENTS
AIR CONDITIONER	13 (10%)
COOLER	18 (15%)
FAN	78 (65%)
NORMAL TEMPERATURE	11 (9%)
OUTDOORS	17 (14%)

Pie chart on distribution of cases based on the living environment



Results: Gathered and evaluated 120 cases out of which, 13 (10%) lived in an air- conditioned environment, 18 (15%) lived in environment with cooler, 78 (65%) lived in environment with fans, 11 (9%) lived in an environment with normal temperature and 17 (14%) majorly lived outdoors.

DISCUSSIONS

In this research, we noticed that most cases were in males 73% and the remaining 27% in females, similar data was obtained in the United States of America where a clinical study was performed out of which 68.2% were males and 31.8% were females.

Based on the body mass index (BMI), we found that the majority of cases were of overweight 49%, followed by 33% normal weight. By seeking more information, we learned that the majority of cases were in obese patients and

the research was planned as a cross-sectional survey conducted in United States, the distribution of BMI groups in the sample population indicates that 54.56% were overweight, 26.3% had normal weight, while 6% were underweight and 13.14% were obese.

In our study, we find that many of the patients were also diagnosed with co-morbidity, such as hypertension 85%, coronary artery disease 81% and diabetes mellitus 76%; diabetes was also reported to be high in Lebanon (46.8%), (21.2%) in Kuwait and (35%) in Egypt.

It was estimated from the patient's habits that 28 (18%) were smokers, 26 (16%) were alcoholics compared to the study where 10.4% patients had smoking habits, 54.8% were non-smokers and 34.8% were past smokers.

Our analysis shows that 20% are vegetarian and 80% are non-vegetarian and this study concludes that vegetarians are at lower risk of cardiovascular diseases as opposed to non-vegetarians similarly, the study carried out in Tamil Nadu's Vellore district found that non-vegetarian patients suffer more from cardiovascular disease than vegetarian patients.

Of the 120 patients studied, 45% patients were prescribed Furosemide, 60% were prescribed Hydrochlorothiazide and 26% were prescribed with Spironolactone comparably to the research where it suggests that diuresis after administration of a loop diuretic dose occurs within the first few hours after administration and that loop diuretics induce natriuresis, due to which urine sodium (Unna) concentration may serve as a functional, physiologic and direct measure for diuretic responsiveness.

Another study compared the intermittent administration as well as the continuous infusion of furosemide and resulted that it had a significant effect on the 24-hour urine volume and total weight loss in the patients with AHF.

Authors contribution

All the authors have made contribution in conceptualization and designing of the study and analysis of the same, contributed to acquisition of data along with analysis and interpretation of data has been involved in revising it critically for intellectual content, given final approval of the version to be published. Lastly all of them were involved in drafting the manuscript along with revising the same for intellectual concept.

CONCLUSION

The results of the study showed that Diuretics have been useful in treatment of cardiovascular disease. On Analyzing the patient report, it was noticed that the most widely prescribed Diuretic was Hydrochlorothiazide (60%), Furosemide (45%), and Spironolactone (25%).

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