A Survey Report On Lifestyle Of Cardiovascular Patients

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ABSTRACT

Background- The major cause of death worldwide, including in India, is cardiovascular diseases (CVDs). Major risk factors for CVD are becoming more common in the Indian population, according to several surveys carried out throughout the nation over the past few decades. Lack of a surveillance system and improper diagnosis are the main causes of India's rising risk factors for CVD.

Aim and Objective: To determine the lifestyle of cardiovascular patients along with what medication they are taking.

Materials and Methods: This was a cross-sectional survey done among two cardiovascular hospitals. The prescriptions were collected from cardiovascular patients along with put up questions related to their lifestyle. In addition, platforms like Google scholar, science direct were used to review the literature for any relevant articles on cardiovascular disorders between 2015 and 2025. The epidemiology of cardiovascular disease, specifically coronary heart disease (CHD), stroke, and associated risk factors in the Asian Indian community, is reviewed in this article.

Results: As per the survey, among all the prescribed medicines, most of the persons who are having heart related issues are from Urban areas (77%) than the rural ones (23%). Also, most of the heart patients rely on junk food (22%) followed by physically inactive i.e. no workout or any cardio workout or activity (19%), then drinkers or smokers (10-13%) and others are having high cholesterol and obesity etc. The majority of the population is male (65%) than female (35%) who are having cardiac related issues. People in the age group of 40-60 are having major health related issues, followed by 60-80 age group people and so on.

Keywords: Cardiovascular diseases, Epidemiology, Acute Coronary Syndrome, Congenital Heart Disease, Cerebrovascular illness, Rheumatic heart disease.

INTRODUCTION

Coronary heart disease, cerebrovascular illness, rheumatic heart disease, and other problems are included in the category of cardiovascular diseases (CVDs). Heart attacks and strokes account for more than four out of five deaths from CVD, and one-third of these deaths happen before the age of 70. With an estimated 17.9 million deaths annually, cardiovascular diseases (CVDs) are the world's leading cause of mortality. The most significant behavioral risk factors for heart disease and stroke are poor nutrition, inactivity, tobacco use, and excessive alcohol consumption. Individuals may experience elevated blood pressure, elevated blood glucose, elevated blood lipids, and overweight or obesity as a result of behavioral risk factors. These "intermediate risks factors," which are indicative of a higher risk of heart attack, stroke, heart failure, and other consequences, can be assessed in primary care settings.

Cardiovascular disease is widespread; in fact, most persons over sixty will have some kind of CVD. There are two types of risk factors for CVD: modifiable and non-modifiable. Obesity, hypertension, hyperlipidemia, diabetes mellitus, metabolic syndrome, and lifestyle risk factors such poor diet, smoking, and inactivity are all modifiable risk factors. Cardiovascular complications are recognized to be mostly caused by common cardiovascular risk factors, including advanced age, hypertension, diabetes, hypercholesterolemia, left ventricular hypertrophy, and heart failure.

While the conventional cardiovascular risk factors have been thoroughly studied, dietary variables are also significant in the pathophysiology of CVD and may significantly influence CVD risk factors like blood pressure and dyslipidemia, although they have received less attention. The global cost of not investing in cardiovascular disease prevention and treatment is predicted to exceed $47 trillion over the course of the next 25 years.

Premature deaths can be avoided by identifying people who are most at risk of CVDs and making sure they receive the right care. To guarantee that people in need receive care and counseling, all primary healthcare institutions must have access to fundamental health technologies and medications for non-communicable diseases [1].

TYPES AND SYMPTOMS

Most notably, even in the absence of significant alterations in the underlying pathophysiology, patients with CVD may exhibit symptoms. Additionally, especially in advanced CVD, the lack of symptoms does not always imply a change in the underlying etiology [2, 3]. However, symptoms are important in CVD, especially in peripheral vascular disease, heart failure (HF), valvular disorders, stroke, acute coronary syndrome (ACS), and rhythm problems.

1. ACUTE CORONARY SYNDROME

Chest Pain and Associated Symptoms

Chest pain is the most commonly reported symptom of ACS. Chest pain can extend to the jaw, shoulder, arm, or upper back and is frequently reported as sub-sternal pressure or discomfort. Dyspnea, diaphoresis, unusual weariness, nausea, and lightheadedness are the most frequent co-occurring symptoms with chest pain [4]. Unusual weariness and weakness are examples of symptoms that are frequently classified as atypical in ACS; however, this classification may be due to men being the norm for normal symptom presentation rather than actual symptom frequency. Seven papers evaluating prodromal symptoms of ACS were reviewed,[5] Chest pain, arm pain, jaw pain, back/shoulder blade pain, unusual exhaustion, dizziness, headache, anxiety, shortness of breath, sleep disturbance, and gastrointestinal problems were described in ACS. Additionally, patients with chronic angina have greater rates of anxiety and sadness [6]. Although the impact of depression on the reporting of physical symptoms of ischemic heart disease is yet unknown, patients with depression may experience increased chest discomfort and dyspnea [7].

2. HEART FAILURE

Dyspnea

One of the main symptoms of heart failure is dyspnea, also known as shortness of breath, breathing difficulty, or breathlessness. One of the most frequent causes of hospitalization for individuals with heart failure is increased dyspnea, and severe dyspnea is linked to a higher risk of death [8]. Dyspnea is frequently described in terms of provocation, which includes orthopnea, bendopnea, paroxysmal nocturnal dyspnea, dyspnea at rest, and dyspnea during exertion [9, 10]. In order to capture this prevalent and complex symptom, it is crucial to take dyspnea heterogeneity into consideration in both clinical practice and research. This can be done by employing subtle assessments and probing inquiries. Patients with various clinical phenotypes of dyspnea in heart failure have been identified with the use of profiling approaches [11]. Additionally, when assessing dyspnea, it's critical to take non-HF-related factors into account, particularly concomitant illnesses like chronic obstructive pulmonary disease [12].

Early Physical Symptoms

Early and mild symptoms may also be signs of deteriorating heart failure, an upcoming hospital stay, or even death. For instance, intestinal congestion may be linked to gastrointestinal symptoms like upset stomach, nausea, vomiting, and appetite loss [13]. The most prevalent and annoying characteristic symptom of heart failure is fatigue. Exercise intolerance is caused by fatigue, which has a variety of causes that are both connected to and unrelated to the pathophysiology of heart failure, particularly when dyspnea co-occurs. When combined, these symptoms may signal the onset of cachexia and muscle atrophy, which are signs that heart failure is getting worse [14], [15].

Other Symptoms and Symptom Clusters

In addition to adverse effects from drugs (such as nocturia), adults with HF frequently suffer sleeplessness and wake disturbances caused by both HF (such as pulmonary congestion) and non-HF reasons (such as sleep apnea). In HF, pain is a prevalent but frequently uninvited symptom that may have non-cardiac (such as diabetic neuropathy) or cardiac (such as deconditioning) origins. Physical constraints may make pain worse for certain HF patients as their lives are coming to an end. Apart from physical symptoms, mood disturbances are reported by 25% to 30% of adults with heart failure. These disturbances typically take the form of anxiety and depression symptoms, which are independently linked to poor clinical outcomes. In HF, physical and affective symptoms frequently cluster together regardless of cultural differences, and such symptom clusters are associated with a gradient in clinical event risk [16], [17].

Patients with heart failure frequently have cognitive impairment. It is probably caused by reduced cerebral blood flow brought on by heart failure and is linked to both anatomical and functional alterations in the brain. The fact that cognitive dysfunction is a symptom of heart failure (HF) and that it directly impairs a patient's capacity to identify and react to other symptoms when they arise is a significant problem. Consequently, the 30-day and 1-year mortality rates are higher for HF patients with cognitive dysfunction [18]. However, by definition, cognitive dysfunction is not subjective and is therefore not a symptom.

3. VALVULAR HEART DISEASE

The symptoms of valvular heart disease are sometimes indistinguishable from those of other causes of heart failure. While still common in low- and middle-income nations, rheumatic heart disease has virtually vanished elsewhere, with population aging and cardiomyopathies now being the main causes of valve dysfunction. Patients typically experience a protracted time of no symptoms in the absence of acute severe valve failure, which is followed by a period of escalating symptoms caused by either subsequent myocardial remodeling and dysfunction or the valve lesion itself. Ventricular function, symptoms, and valve abnormalities are all taken into consideration when staging valvular heart disease. Right-sided heart failure and pulmonary hypertension with tricuspid regurgitation can eventually arise from left-sided valve disease. Maximum exercise testing may help with functional assessment (i.e., cardiopulmonary exercise testing) [19], [20].

4. STROKE

Acute Stroke Symptoms

After a stroke, disability and quality of life are frequently predicted by acute symptoms. For effective therapy, it is crucial to recognize and act upon stroke signs and symptoms promptly [21]. FAST64 (facial, arm, speech, time) and similar acronyms were created to help the general people identify and respond to the most prevalent stroke symptoms prior to hospitalization. The chance of seeking emergency care has been linked to weakness and numbness, speech difficulties, confusion, dizziness and loss of coordination/balance, and abnormalities in vision, [22, 23] However, each symptom has a different response time. When deciding whether to activate a

stroke response team, clinicians must take into account both typical and nonclassic stroke symptoms, such as partial sensory impairment, dysarthria, vertigo, and diplopia [24].

Post stroke Symptoms

Acute symptoms following a stroke may worsen with time or rehabilitation, or they may persist and become impairments. The Stroke Specific Quality of Life scale is the most widely used method for evaluating physical function, however there are other options. It is also quicker and simpler to use in daily practice. Anxiety, despair, exhaustion, and pain are frequent post-stroke symptoms that are linked to stroke severity, physical handicap, and cognitive deficits [25]. At different phases of stroke recovery, approximately one-fourth of stroke survivors express anxiety, one-third report sadness, at least half report fatigue, and up to half report pain [26], [27].

5. RHYTHM DISORDERS

Common signs of cardiac arrhythmias include atrial fibrillation (AF), atrial flutter, supraventricular tachycardia, Brady arrhythmias, and ventricular tachycardia. Many cardiac arrhythmias are characterized by palpitations, which are the perception of an irregular, fast, fluttering, skipping, or stopping heartbeat. The most prevalent heart arrhythmia, atrial fibrillation (AF), can manifest as palpitations or less specific symptoms, such as fatigue, dyspnea, or dizziness, that are linked to a variety of medical problems [28]. Although palpitations are thought to be the most common way that AF symptoms manifest, patients with newly developed AF may have nonspecific symptoms or no symptoms at all. The most common symptoms described by individuals with AF are palpitations (27%–70%), fatigue (26%–75%), and dyspnea (28%–76%). Less often reported symptoms include chest pain (12%–30%), dizziness (19%–44%), presyncope/syncope (3%–4%), and anxiety (12%–50%) [29]. The intensity of AF symptoms may also be correlated with psychological distress [30]. Finally, it is not always the case that AF symptoms match objectively observed AF occurrences. AF can alternate between being symptomatic and asymptomatic even within the same person [31]. Some symptom fluctuation can be attributed to tachycardia, however symptoms are not always eliminated by controlling heart rate. Although AF ablation lessens symptoms, the effect is not entirely due to a decrease in the burden of AF. Interestingly, 52% of AF episodes were asymptomatic prior to AF ablation and 79% were asymptomatic following ablation in one research [32]. Additionally, AF is a well-known risk factor for dementia and stroke. Furthermore, the diagnosis of AF is a risk factor for poor cognitive function even in patients who have never had a stroke. AF symptoms are frequently mistakenly linked to deconditioning, stress, or drowsiness, which causes many to put off getting help for a week or more. While cardiac-specific symptoms, such as palpitations and chest pain, are not linked to a delay in seeking treatment for AF, nonspecific symptoms, such as fatigue and dyspnea, and intermittent symptoms are. Higher hospitalization rates were linked to more severe AF symptoms. Fifty percent of patients who visit the emergency room for AF do there because of their symptoms [33], [34].

6. PERIPHERAL VASCULAR DISEASE

Peripheral Arterial Disease

Venous or arterial pathology can cause peripheral vascular disease and the symptoms that go along with it. The progressive atherosclerotic condition known as peripheral arterial disease (PAD) The most severe type of PAD, known as limb ischemia, causes pain in the legs, feet, or toes. Major adverse cardiovascular events are more likely to occur in men with symptomatic PAD.

Peripheral Venous Disease

Peripheral venous disease (PVD) sufferers may have symptoms or none at all, just as PAD patients. Leg pain, hurting, weariness, heaviness, cramping, tightness, restless legs syndrome, and skin irritation are all included in the clinical classification of PVD. Pain, heaviness, hurting, and exhaustion were more prevalent in patients with chronic venous problems (n=38750; 78% female) that resulted in inadequate blood flow to the lower limbs. PAD symptoms can range from leg pain at rest to none at all, even as the illness advances. Evaluating symptoms during rest, exercise, and recuperation can help determine whether or not they are ischemic [35].

7. CEREBROVASCULAR DISEASE:

Brain hemorrhage or infarction can result in cerebrovascular disease. Hypothyroidism, hypertension, sepsis, vascular malformation, and neoplasia are among the underlying conditions that may be linked to cerebrovascular illness [36].

8. CONGENITAL HEART DISEASE:

Congenital heart disease refers to anatomical defects of the heart that develop prior to birth. During pregnancy, the fetus develops these abnormalities in the uterus. Congenital heart disease does not have specific symptoms, but it might cause shortness of breath, difficulty exercising, exhaustion, and an irregular heartbeat that a doctor can determine by listening to the heartbeats [37].

9. RHEUMATIC HEART DISEASE.

In children and young adults, rheumatic heart disease (RHD) continues to be a leading cause of avoidable death and disability. RHD is still a major global public health issue, particularly in low- and middle-income nations. In addition to highlighting the disease burden, echocardiographic screening has been significant in increasing the accuracy of detecting RHD [38].

RISK FACTORS OF CARDIOVASCULAR DISEASE (CVD)

Although the precise etiology of cardiovascular disease (CVD) is unknown, a number of factors can raise your chance of developing it. We refer to these as "risk factors" [39]. In order to identify people who are more prone to develop CVD and to utilize interventional strategies to treat the risk factors and adjust their effects on CVD risk, knowledge and detection of risk variables that precede CVD are crucial [40, 41]. Major modifiable risk

factors for CVD include high blood pressure (BP), diabetes mellitus, cigarette smoking, and abnormal lipid levels [42].

1.   HIGH BLOOD PRESSURE (HYPERTENSION)

High BP has a high prevalence of exposure and is linked to the strongest evidence of causation. The role that blood pressure plays as a risk factor for CVD is, however, underrepresented since there is strong evidence that a biologically normal level of blood pressure in humans is far lower than what has historically been used in clinical practice and research [43].

"A shift in the distribution of blood pressure to the right is the primary cause of cardiovascular disease in humans" [43].

The two leading causes of death for people globally, coronary heart disease and stroke, are significantly influenced by hypertension. A systolic pressure of 140 mm Hg or higher and/or a diastolic pressure of 90 mm Hg or higher, which are deemed to be over the normal range, are generally regarded as high blood pressure, or hypertension. Because of elevated blood pressure, it most likely causes mechanical damage to the artery wall [44].

Short-term and long-term consequences of high BP

- **Short term consequences**

Stroke

Coronary heart disease

Heart failure

Cardiovascular death

- **Long term consequences**

Hypertensive cardiomyopathy

Heart failure with preserved ejection fraction

Atrial fibrillation

Valvular heart disease

Aortic syndromes

Peripheral arterial disease

Chronic kidney disease

Dementias

Diabetes mellitus

Erectile dysfunction [45].

2.   LIPID ABNORMALITIES

Abnormal serum cholesterol levels were linked to the largest attributable risk for the occurrence of CVD, particularly ischemic heart disease, among all modifiable risk factors of CV illness, according to a global analysis [46, 47]. Many people believe that high serum total cholesterol (TC) is the primary cause of coronary atherosclerosis, and it is widely known that excessive TC raises the risk of CVD [48]. High-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), and very low-density lipoprotein (VLDL) are examples of lipoproteins, which are biochemical assemblies whose main purpose is to transport fat molecules in water, as in blood plasma or other extracellular fluids [49]. Numerous epidemiological and interventional studies have determined that LDL-C is the primary risk factor for CVD due to its significant role in the pathophysiology of atherosclerosis [50, 51, and 52].

3.   SMOKING

Smoking has been linked to an increased risk of sudden death [54], a >70% excess rate of mortality from coronary heart disease [53], and a two to fourfold increased risk of coronary heart disease. Additionally, there is ample evidence linking smoking to an increased risk of peripheral vascular disease. Almost all patients with thromboangiitis obliterans and around 70% of individuals with atherosclerosis obliterans are smokers [55]. It is still unclear how smoking cigarettes causes cardiovascular illness and death. The majority of studies have concentrated on the possible functions of nicotine and carbon monoxide, despite the fact that cigarette smoke contains over 4,000 components [56]. Both conditions have a deleterious effect on the myocardial oxygen supply demand ratio. Nicotine increases heart rate and systolic blood pressure, which boosts the oxygen demand on the heart. In addition to being likely atherogenic, carbon monoxide directly lowers the amount of oxygen available to all bodily tissues, including the heart [57].

4.   DIABETES MELLITUS

Diabetes mellitus and cardiovascular disease (CVD) are known to be linked [58]. Diabetes-related increases in sympathetic tone are linked to alterations in cardiac and vascular function that result in hypertension, left ventricular dysfunction, and cardiac autonomic neuropathy; these alterations pave the way for arrhythmia, silent infarction, and unexpected death [59].

5.   OBESITY

Body mass index was a strong independent marker of systolic and diastolic pressures in women, while in men waist-to-hip ratio was equivalent to body mass index in this regard. Body mass index (>30 kg/m2) proved to be associated with CHD in women alone [60].

6.   PHYSICAL ACTIVITY

Evidence that physical activity has a cardio protective effect may be found in >50 observational studies in which physically active individuals had a lower risk of coronary heart disease (CHD) compared with inactive individuals. Decreasing physical activity exhibited a significant trend as an independent predictor not of coronary morbidity, but of coronary mortality [61, 62].

7.   FAMILY HISTORY OF CVD

More than 82 million Americans have 1 or more forms of cardiovascular disease (CVD), accounting for 32.8% of all deaths in the United States. Although the evidence for the familial aggregation of CVD is strong, the relationship between family history (FH) of CVD, perceived risk for CVD, and health-related behavior is poorly understood. You're considered to have a family history of CVD if either: your father or brother were diagnosed with CVD before they were 55, your mother or sister were diagnosed with CVD before they were [63].

8.   ETHNIC BACKGROUND

It is estimated that 1.3 million Canadians are currently living with CVD. CVD rates among Canadians have been shown to differ among ethnic groups. Aboriginal people in Canada have a greater frequency of CVD compared with Canadians of European origin. Individuals of Chinese origin exhibit lower rates of coronary heart disease compared with individuals of European, and South Asian origin. This shows the ethnic background in CVD [64].

9.   OTHER RISK FACTORS

Other factors that affect your risk of developing CVD include:

- **AGE** – CVD is most common in people over 50 and your risk of developing it increases as you get older

- **GENDER** – men are more likely to develop CVD at an earlier age than women

- **DIET** – an unhealthy diet can lead to high cholesterol and high blood pressure

- **ALCOHOL** – excessive alcohol consumption can also increase your cholesterol and blood pressure levels, and contribute to weight gain [65]

PATHOPHYSIOLOGY

1.   ACUTE CORONARY SYNDROMES

The acute coronary syndromes of unstable angina, acute MI, and ischemic sudden death appear to share a common pathophysiologic basis, with plaque fissure in the coronary artery as the pathologic hallmark. [66] In addition to the plaque fissure, varying amounts of intraluminal and intramural platelet-fibrin thrombus constitute the acute intimal lesion observed in the vast majority of patients who die of acute coronary syndromes. When plaque fissure is associated with brief periods of coronary occlusion (due to platelet aggregation, vasoconstriction, or evanescent platelet-fibrin thrombosis), the result is unstable angina; when the coronary occlusion is more prolonged, the result is acute MI. Sudden cardiac death is likely to occur when a large area of myocardium is rendered ischemic, leading to a fatal disturbance in cardiac rhythm or conduction. This may develop during brief or prolonged periods of coronary occlusion or perhaps when platelet aggregates embolize downstream from the acute coronary lesion [66, 67].

2.   HEART FAILURE

Heart failure can be classified according to several pathophysiological or functional perspectives, such as the affected circulatory system (right-left), cardiac function (systolic diastolic), or the underlying pathophysiological factor (pressure-induced/volume-induced).

Systolic versus diastolic heart failure

For understanding the basic mechanisms and principles of the pathophysiology of heart failure, a clear definition and understanding of the primary mechanisms of systolic (HF-REF) and diastolic (HF-PEF) heart failure are essential. Systolic and diastolic heart failure are distinct syndromes with well-known pathophysiology, symptomatology, and epidemiology. Not only differ development of impaired heart function, but also macro- and micromorphology of the heart, including the cardiomyocytes or the extracellular matrix structure. Systolic heart failure is characterized by an impaired left ventricular contractility, resulting in a reduced EF. Therefore, this syndrome is also called heart failure with reduced left ventricular ejection fraction (HF-REF). The most common underlying causes of systolic heart failure are ischemic heart disease, cardiomyopathies, and heart valve diseases. In contrast to systolic, diastolic heart failure is accompanied by impaired ventricle relaxation and filling, increased ventricle stiffness, and therefore, an elevated filling pressure as a response of pressure overload. Diastolic heart failure is characterized by a concentric remodeling or ventricular hypertrophy resulting in pressure overload, and mainly backward heart failure. The EF is normal (called heart failure with preserved ejection fraction = HF-PEF), thus diagnosis and follow-up seem more difficult, than in systolic heart failure. It is usually related to chronic hypertension or ischemic heart disease but can be due to restrictive, infiltrative, or hypertrophic cardiomyopathies as well [68, 69].

Pressure-overload versus volume-overload heart failure

Left ventricular dysfunction by pressure overload may develop due to adverse left ventricle chamber remodeling, decreased myocardial contractile function, or a combination of these. It mostly occurs in aortic valve stenosis and/or arterial hypertension. Volume overload refers to the state when the heart chambers are overfilled with blood, which they try to transmit into the systemic circulation. Various pathologies can lead to volume overload, such as arteriovenous malformations and fistula, congenital heart diseases (persistent ductus arteriosus and ventricular septal defect), or valvular heart diseases (e.g., aortic regurgitation and mitral regurgitation). The pulmonary circulation is also affected in valvular heart diseases (tricuspid regurgitation and pulmonary regurgitation) or in congenital atrial septal defect.

Low-output versus high-output heart failure

Low-output means that the cardiac output (CO) fails to fulfill the blood and oxygen requirements of the peripheral tissues and cannot rise with exertion. The causes of low output heart failure can be divided into three groups: pump failure, excessive preload, or excessive afterload:

1. Pump failure (reduced inotropy)

a.   Systolic heart failure

b.   Relevant bradycardia

c.   Negative inotropic medications

2. Excessive preload (volume overload)

a.   Mitral regurgitation

b.   Aortic regurgitation

3. Excessive afterload (pressure overload)

a.   Aortic stenosis

b.   Hypertension

High-output heart failure occurs when the CO is normal or elevated, to meet the increased requirements of the body, but still fails to meet demands. Volume overload results from chronic neurohumoral activation and progresses to ventricular dilation and structural remodeling over time. Clinically, high-output heart failure presents with tachycardia jugular venous distension, and warm, sweaty skin. The clinical findings however depend strongly on the underlying disease. There are several physiological circumstances which may result in a hyper dynamic state, such as stress/anxiety, physical exercise, pregnancy, or fever [70].

•   **Unilateral heart failure: Right-sided versus left-sided heart failure**

Left- and right-sided heart failure are clinically separated syndromes; however, patients often present with a combination of left- and right-sided hear failure, what is called global congestive heart failure. This close relationship occurs due to the interdependence of the two connected circulatory systems of the heart: the systemic, "left" and the pulmonary, "right" circulatory system. In left-sided cardiac dysfunction the heart fails to maintain a continuous peripheral tissue perfusion with the required amount of blood. Not only the amount

of blood volume is reduced, also the distribution changes. Thus, compensatory mechanisms occur, for instance, the utilization of oxygen from the blood increases. The heart tries to compensate with an increased filling, thus systolic and diastolic pressure in the left atrium rises, causing an elevated pressure status in the pulmonary circulatory system. The pressure induced fluid-leakage from the capillaries leads to chronic pulmonary congestion. The juxta-alveolar tension receptors become also activated and the elastic resistance increases, leading to the well-known symptoms and signs of left-sided heart failure. The reflex-tachycardia may, in contrast, lead to a vicious circle by additionally reducing the ability of the heart to contract effectively. Right-sided heart failure is characterized by a reduced blood supply mainly in the pulmonary circulation. In chronic cases, it shifts to the left atrium and reduces the systemic blood supply as well. To maintain a sufficient preload, the systolic and diastolic pressure rises in the right atrium, which leads to congestion in the gastrointestinal tract followed by anorexia, hepato-splenomegaly with/without ascites, and anasarca by increased hydrostatic pressure in the capillaries. Right ventricular heart failure often presents concomitant to a left ventricular dysfunction but can also exist as an isolated cardiac failure, as a result of a right ventricular myocardial infarction, chronic obstructive pulmonary disease, or pulmonary hypertension, or by rare diseases like severe tricuspidal regurge or arrhythmogenic right ventricle disease [71].

3.   VALVULAR HEART DISEASE

The histopathologic heterogeneity of CAVD indicates the involvement of diverse cell-dependent mechanisms that regulate calcium load on the valve leaflets [72], as well as the participation of different cell types, including interstitial cells, endothelial cells and cardiac chondrocytes, in valve bio mineralization [73]. Aggravated fibro calcific responses have been observed in CAVD in association with increased levels of oxLDL [74].

PREVENTION OF CARDIOVASCULAR DISEASE (CVD)

Prevention of CVD start with the recommendation of healthy lifestyle. **Changing smoking behavior** is the cornerstone of this essential step in cardiovascular prevention. Smoking is responsible for 50% of all avoidable deaths in smokers, half of these are due to CVD [75]. Using the SCORE-tables, smoking will double the 10 years mortality risk for CVD and this effect is even stronger in smokers, 50 years age. The risk associated with smoking shows a dose-response relationship [76]. Any form of tobacco use is deleterious and passive smoking increases also the risk of CVD, a strong argument to minimize exposure to environmental tobacco smoke. The immediate and long-term benefit of smoking cessation is well documented. A nice example is that smoking cessation after a myocardial infarction result in the most optimal secondary prevention strategy resulting in a mortality benefit of 0.64 [95% confidence interval (CI) 0.58–0.71] compared to continued smoking [77]. To achieve the objective of smoking cessation an intensive program must be proposed by the health care providers including professional assistance for optimizing patient's motivation and often pharmacological aids. Nicotine replacement therapy, varenicline or bupropion should be prescribed to those smokers who are motivated to stop [78-80].

A healthy diet has a central place in the prevention of cardiovascular disease. Most evidence underscoring the impact of healthy dietary habits on cardiovascular risk comes from observational studies [81]. The most important characteristics of a healthy diet are: saturated fatty acids ,10% of total energy intake, through replacement by polyunsaturated fatty acids; as little as possible trans-unsaturated fatty acids (,1% of total energy intake); ,5 g of salt/day; 30– 45 g of fiber/day; 200 g fruit/day; 200 g of vegetables/ day; fish at least twice a week; consumption of alcoholic beverages limited to 2 glasses/day (20 g/day alcohol) for men and one glass/day (10 g/day) for women [84]. The energy intake should be tailored to the amount of energy needed to obtain a healthy weight (BMI, 25 kg/m2. No nutrition supplements are need.

Regular physical activity and aerobic exercise training are related to a reduced risk of CVD and non-fatal coronary events and this is true for healthy subjects as for patients with coronary risk factors and cardiac patients [82, 83]. Therefore, guidelines suggest 2.5–5 hours/week of physical activity or aerobic exercise training of at least moderate intensity or 1– 2.5 hours/week of intense exercise for a healthy adult. Patients with a history of coronary artery disease or heart failure should perform moderate-to-vigorous intensity aerobic exercise training 3/week during 30 minutes sessions [84].

Multimodal behavioral intervention focusing on health education, physical exercise but also psychological risk factors should be part of cardiovascular prevention. Attention should be paid to depression and anxiety, and treatment should be offered by psychotherapy and antidepressant/anxiolytic medication when symptoms are severe. Stress-management programs have shown to improve well-being and have a beneficial effect on cardiovascular risk factors and CVD outcomes [85].

Weight reduction in overweight (BMI 25–29.9 kg/ m2) and obese (BMI.30 kg/m2) patients is an important aspect of cardiovascular prevention as this is associated with a favorable effect on cardiovascular risk factors such as blood pressure, dyslipidemia and insulin resistance [84].

Increasing BMI is associated with risk of CVD but perhaps that regional distribution of adipose tissue is even more important in determining cardiovascular risk. Therefore, the WHO defines >94 cm of waist circumference for men and 80 cm for women as the threshold at which no further weight should be gained and >102 cm for men and 88 cm for women as thresholds at which weight reduction should be advised [86]. If diet and behavior measurements are unsuccessful, medical therapy with orlistat and/or bariatric surgery are often the only options in patients with a BMI>40 kg/m2 or a BMI>35 kg/m2 in the presence of high-risk co-morbid conditions [87, 88].

Elevated blood pressure is a major risk factor for CVD, renal failure and atrial fibrillation [89]. Grade 1, 2 and 3 hypertension are defined as a systolic blood pressure level of 140–159, 160–179 and §180 mm Hg and/or a diastolic blood pressure of 90–99, 100– 109 and >110 mmHg respectively. Methodological aspects, interest of ambulatory blood pressure measurements and blood pressure thresholds with different types of blood pressure measurement are summarized in the new ESH/ESC guidelines for the management of arterial hypertension [90].

Following these guidelines a number of tests should be performed routinely making a risk estimation in these patients feasible and reliable [90].

The decision to start pharmacological treatment will depend on the blood pressure level and the estimation of the total cardiovascular risk of the individual patient. After a proper history, physical examination and laboratory testing the physician should be able to identify the presence of established cardiovascular or renal disease, the presence of subclinical CVD and/or the co-existence of other cardiovascular risk factors.

Following the most recent guidelines on the management of arterial hypertension the target value of the systolic blood pressure should be, 140 mmHg, also in the diabetic patients. Only in the elderly patient's reduction up to 140–150 mmHg is recommended. The target for the diastolic blood pressure should be, 90 mmHg except for diabetic patients (, 85 mmHg). Life style interventions are often insufficient to normalize blood pressure but are important measurements to achieve optimal blood pressure control. Alis Kiren, a renin inhibitor and the centrally acting agents have a favorable effect on the blood pressure but side-effects and contra-indication must be taken into account. Most of the hypertensive patients will need more than one drug to normalize blood pressure and combination of more than one class has the advantage of being more potent than increasing the dose of one of the classes. This more effective result together with less side-effects of some combinations favors the use of combination treatment strategies in most of the hypertensive patients. The only combination that should be avoided is the combination between two different blockers of the RAS [90].

Renal denervation and baroreceptor stimulation have actually only a low level of evidence recommendation in the treatment of resistant hypertension.

MANAGEMENT OF CARDIOVASCULAR DISEASE (CVD)

The management of cardiovascular disease (CVD) involves a comprehensive approach that includes lifestyle modifications, medical treatments, and sometimes surgical interventions. Here are the key components of CVD management:

1. Lifestyle Modifications

Diet

Heart-healthy diet: Emphasize fruits, vegetables, whole grains, and lean proteins. Limit saturated fats, Tran's fats, cholesterol, sodium, and added sugars.

DASH (Dietary Approaches to Stop Hypertension): This diet is rich in fruits, vegetables, and low-fat dairy products and includes whole grains, fish, poultry, and nuts.

Physical Activity

Regular exercise: Aim for at least 150 minutes of moderate-intensity aerobic exercise or 75 minutes of vigorous-intensity exercise per week, combined with muscle-strengthening activities on 2 or more days a week.

Weight Management

Maintain a healthy weight: Weight loss through diet and exercise can improve cardiovascular health by reducing blood pressure, cholesterol levels, and the risk of diabetes.

Smoking Cessation

Quit smoking: Smoking cessation dramatically reduces the risk of developing CVD and improves outcomes in those already diagnosed.

2. Medical Treatments

Medications

Antihypertensives: Used to manage high blood pressure.

Examples: ACE inhibitors (e.g., lisinopril), beta-blockers (e.g., metoprolol), calcium channel blockers (e.g., amlodipine).

Statins: Lower cholesterol levels and reduce the risk of heart attacks and strokes.

Examples: Atorvastatin, simvastatin.

Antiplatelets/Anticoagulants: Reduce the risk of blood clots.

Examples: Aspirin, clopidogrel, warfarin.

Diabetes management: For patients with diabetes, managing blood sugar levels with medications such as metformin or insulin is crucial.

3. Monitoring and Follow-Up

Regular check-ups: Frequent monitoring of blood pressure, cholesterol levels, blood sugar levels, and other relevant health metrics.

Routine screenings: E.g., echocardiograms, stress tests, and electrocardiograms (ECGs) as recommended by a healthcare provider.

4. Surgical and Procedural Interventions

Coronary artery bypass grafting (CABG): Surgery to improve blood flow to the heart.

Angioplasty and stent placement: Procedures to open narrowed or blocked coronary arteries.

Valve repair or replacement: For those with significant valvular heart disease.

Implantable devices: Such as pacemakers or defibrillators to manage arrhythmias.

5. Patient Education and Support

Education programs: Teaching patients about their condition and how to manage it.

Support groups: Providing emotional support and shared experiences.

Cardiac rehabilitation programs: Structured programs combining exercise, education, and counseling to improve heart health [91, 92].

MANAGEMENT STRATEGIES LINKED TO EPIDEMIOLOGY

The epidemiology of cardiovascular disease (CVD) encompasses the study of its distribution and determinants within populations. Here are some key points regarding CVD epidemiology:

1. Prevalence and Incidence: CVD, including conditions like heart disease, stroke, and hypertension, is among the leading causes of morbidity and mortality worldwide. Its prevalence varies across regions, with higher rates often observed in developed countries due to lifestyle factors such as diet, physical inactivity, and smoking [93].

2. Risk Factors: Several risk factors contribute to the development of CVD. These include modifiable factors such as unhealthy diet, physical inactivity, smoking, excessive alcohol consumption, and obesity, as well as non-modifiable factors such as age, gender, genetics, and family history [94].

3. Global Burden: CVD is a major global health burden, responsible for a significant proportion of deaths and disabilities annually. It affects individuals across all age groups, although the risk increases with age.

4. Health Disparities: There are disparities in the distribution of CVD, with certain populations experiencing a higher burden of the disease. Factors such as socioeconomic status, access to healthcare, and ethnicity can influence these disparities.

5. Impact of Lifestyle: Lifestyle modifications, including adopting a healthy diet, regular physical activity, smoking cessation, and maintaining a healthy weight, can significantly reduce the risk of developing CVD.

6. Public Health Interventions: Public health interventions aimed at preventing and managing CVD include policy measures to promote healthy lifestyles, screening programs for early detection and treatment of risk factors, and access to quality healthcare services [95].

7. Advancements in Treatment: Advances in medical technology and treatment modalities have improved the prognosis for individuals with CVD. These include medications, surgical procedures, and lifestyle interventions aimed at managing risk factors and preventing complications [96].

Understanding the epidemiology of CVD is crucial for developing effective prevention and management strategies to reduce its burden on individuals and society as a whole.

RESULTS

Among the twenty prescriptions we analyzed that the ECOSPRIN, ATROVAS, FLAVEDON MR, RENAX, TELMA AM 80, NICARDIA, PRAZOPRESSXL, CILACAR 20 MG, AKRAMINE, MET XL 50, X-TOR, REVELOL, VASOPRIN, STARCAD B50 and ROSUVAS medicines are used in cardiovascular disorder. Among these medication ECOSPRIN medicine had the highest usage rate at approximately 70% indicating its widespread prescription for cardiovascular condition, where other medicines have low rates. In contrast, REVELOL, VASOPRIN, STARCAD B50 and ROSUVAS medicines had the lowest usage rate at 5%, suggesting its lesser relevance in cardiovascular treatment regimens.

As per the survey, among all the prescribed medicines, most of the persons who are having heart related issues are from Urban areas (77%) than the rural ones (23%). Also, most of the heart patients rely on junk food (22%)

followed by physically inactive i.e. no workout or any cardio workout or activity (19%), then drinkers or smokers (10-13%) and others are having high cholesterol and obesity etc. The majority of the population is male (65%) than female (35%) who are having cardiac related issues. People in the age group of 40-60 are having major health related issues, followed by 60-80 age group people and so on. These medicines are used in cardiovascular disorder conditions like hypertension, hyperlipidemia, hypercholesterolemia, arrhythmias, heart attack etc.

Table 1 Percentage of prescription of drugs used in CVD

S. NO.	NAME OF MEDICINE	PERCENTAGE OF PRESCRIPTION
1	ESCORPIN	70% (14)
2	ATORVAS	35% (7)
3	FLAVEDON MR	25% (5)
4	RANX	25% (5)
5	TELMA AM 80	25% (5)
6	NICARDIA	20% (4)
7	PRAZOPRESS XL	15% (3)
8	CILACAR 20 MG	15% (3)
9	AKRAMINE	15% (3)
10	MET XL 50	10% (2)
11	X TOR	10% (2)
12	REVELOL	5% (1)
13	VASOPRIN	5% (1)
14	SATRCAD B50	5% (1)
15	ROSUVAS	5% (1)
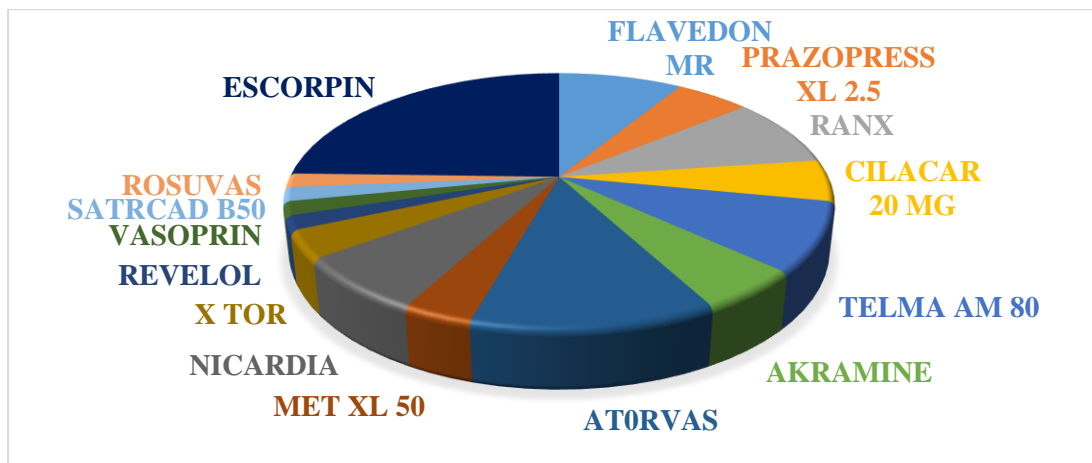
Fig.1. Percentage of prescription
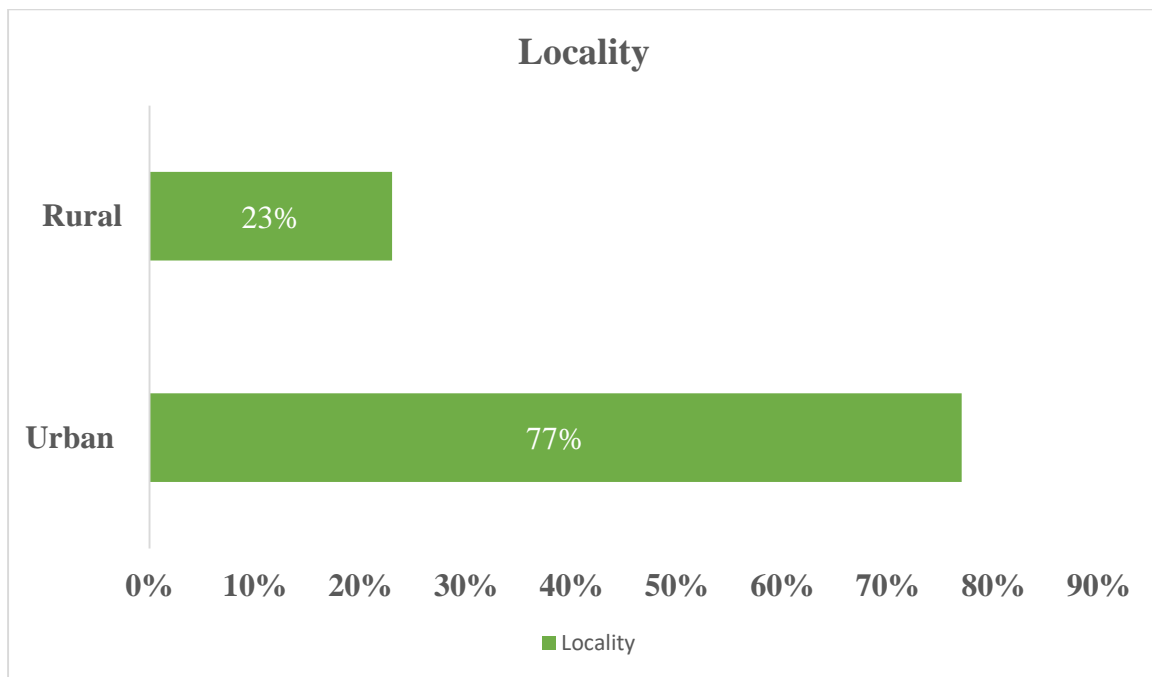
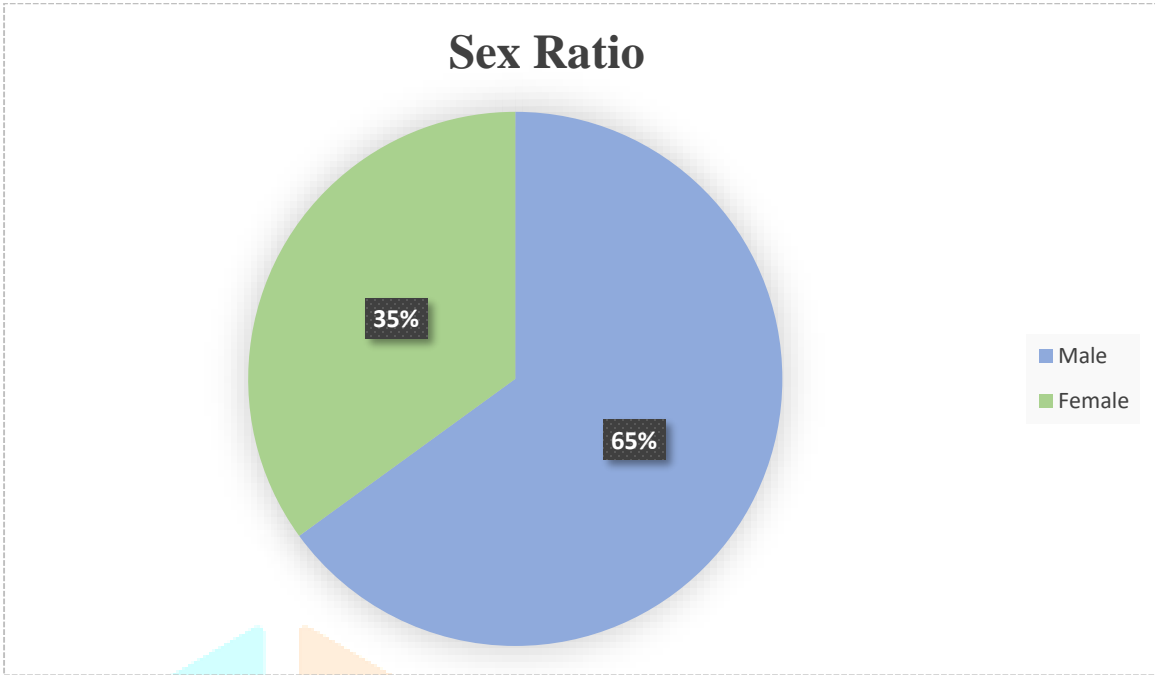**Fig.2. Locality of patients**
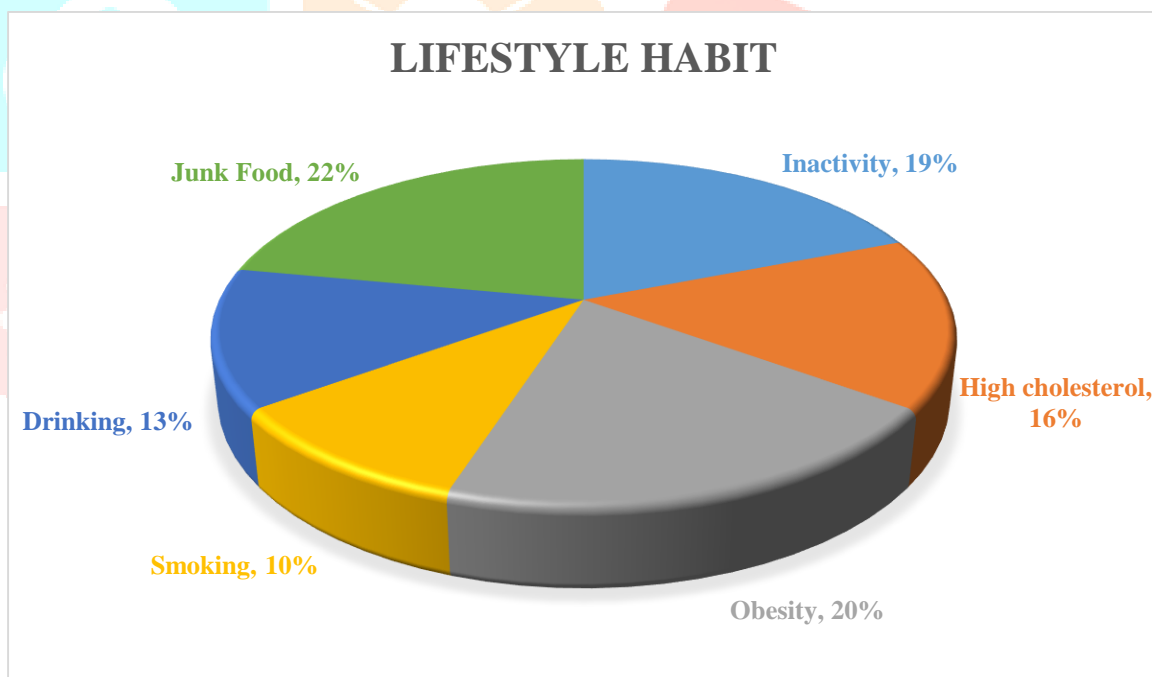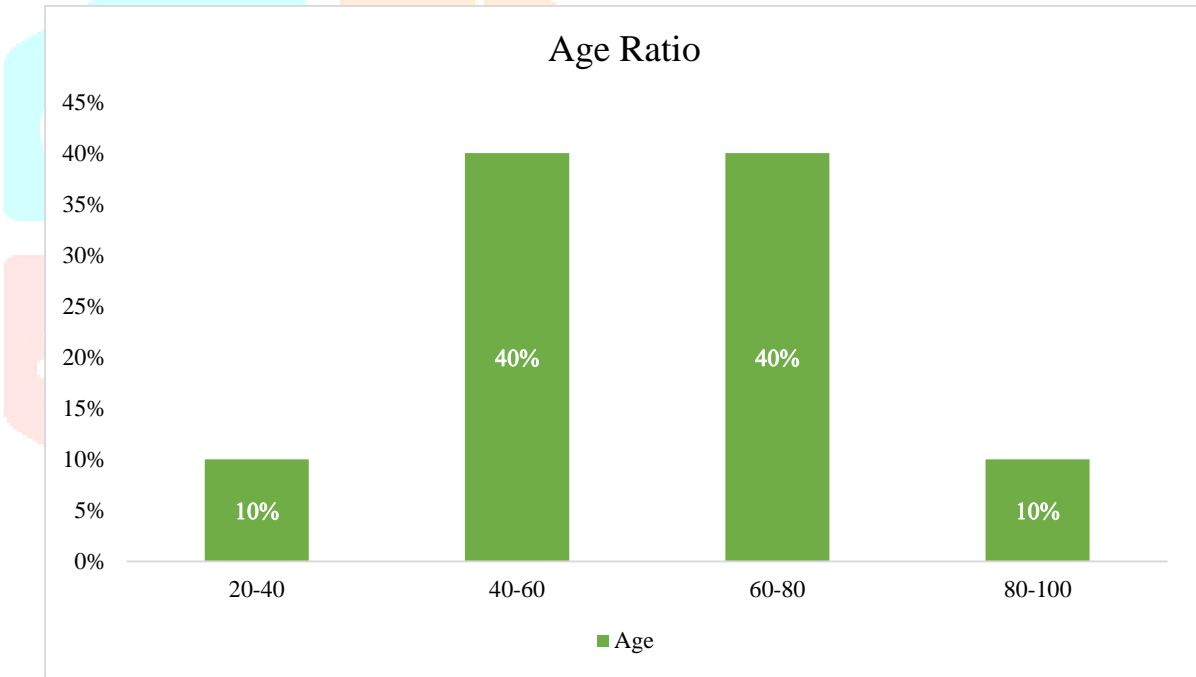

Fig.3. Lifestyle Habit

Fig.4. Gender Ratio

Fig.5. Age Ratio

S.no	NAME	MEDICATION														
		TAB. ECOSPRIN	TAB. FLAVEDON	TAB. TELMA AM 80	TAB. PRAZOPRESS XL	TAB. RANX	TAB. CILACAR	TAB. AKRAMINE	TAB. ATROVAS	TAB. MET XL 50	TAB. NICARDIA	TAB. XTOR	TAB REVELOL	TAB. VASOPRIN	TAB STARCAD B50	TAB ROSUVAS
1	MR. BRIJESH	x	x	x	✓	x	✓	✓	✓	x	x	x	x	x	x	x
2	MR. BHUSHAN	x	x	✓	x	x	x	✓	x	✓	x	x	x	x	x	x
3	MR.SAMBUNATH	✓	x	x	x	x	x	x	x	x	✓	x	x	x	x	x
4	MRS. SANTOSH	✓	✓	x	x	✓	x	x	x	x	✓	x	x	x	x	x
5	MR. BRIJNANDAN	x	x	x	x	x	x	x	✓	✓	x	x	x	x	x	x
6	MRS. KANTA	✓	✓	x	x	x	x	x	✓	x	x	x	x	✓	x	x
7	MR. SAMBHUNAT	✓	x	x	x	x	x	x	x	x	✓	x	x	x	x	x
8	MR. SHAMBHU	✓	x	x	x	x	x	x	x	x	✓	x	x	x	x	x
9	MR. MAHAVEER	✓	✓	x	x	✓	x	x	x	x	x	x	x	x	x	x
10	MRS. PUSHPA	✓	x	x	✓	x	x	x	x	x	x	x	x	x	✓	✓
11	MRS. MADHU	✓	x	✓	x	x	x	x	x	x	x	x	x	x	x	x
12	MR. SHRI PAL	x	x	x	✓	x	✓	✓	✓	x	x	x	x	x	x	x
13	MRS. HASEENA	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x
14	MRS. MUNTASLRA	✓	✓	✓	x	✓	x	x	✓	x	x	x	x	x	x	x
15	MR. NAVAB	✓	x	x	x	x	x	x	x	x	x	✓	x	x	x	x
16	MR. SUSHIL	✓	✓	x	x	✓	x	x	x	x	x	✓	x	x	x	x
17	MR. SHIV	✓	x	x	x	x	x	x	x	x	x	✓	x	x	x	x
18	MRS. LAXMI	✓	x	✓	x	✓	x	x	✓	x	x	x	x	x	x	x
19	MR. YAKOOB	x	x	✓	x	x	x	x	x	x	x	x	x	x	x	x
20	MR. PROMOD	x	x	x	x	x	✓	x	✓	x	x	x	x	x	x	x

Fig.6. Patient's Name with The Medication Prescribed

CONCLUSION

In conclusion, cardiovascular disease (CVD) encompasses a complex array of conditions that affect the heart and blood vessels, leading to significant morbidity and mortality worldwide. The pathophysiology of CVD involves intricate interactions between genetic predispositions, environmental factors, and lifestyle choices that collectively contribute to disease development and progression.

Key factors in the pathophysiology of CVD include atherosclerosis, inflammation, endothelial dysfunction, hypertension, thrombosis, myocardial remodeling, metabolic abnormalities, genetic influences, oxidative stress, and neurohormonal activation. These processes often intertwine, creating a cascade of events that culminate in various cardiovascular conditions such as coronary artery disease, heart failure, stroke, peripheral artery disease, and arrhythmias.

Despite the complexity of CVD, significant strides have been made in understanding its mechanisms and developing effective preventive and therapeutic strategies. Lifestyle modifications, including a healthy diet, regular exercise, smoking cessation, and stress management, play a pivotal role in reducing CVD risk. Additionally, medications targeting hypertension, dyslipidemia, diabetes, and other risk factors can help control disease progression.

Advancements in medical interventions, such as percutaneous coronary interventions, coronary artery bypass grafting, cardiac rehabilitation programs, and novel pharmacological agents, have improved outcomes for individuals with CVD. Early detection, diagnosis, and comprehensive management are essential in mitigating the impact of CVD and improving patient outcomes.

Public health initiatives aimed at raising awareness, promoting healthy behaviors, improving access to healthcare, and addressing socioeconomic disparities also play a crucial role in combating the burden of CVD on a population level.

In summary, while cardiovascular disease remains a significant global health challenge, ongoing research, multidisciplinary approaches, and concerted efforts at individual and societal levels offer hope for reducing its prevalence, complications, and associated mortality rates in the future.

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