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CASE STUDY OF HEART FAILURE

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ABSTRACT

A case study highlights a 55-year-old man admitted for chest pain, sweating, and breathlessness. He has a history of diabetes, hypertension, and hyperthyroidism. Examinations and tests revealed signs of heart issues, and he was given medications to manage his condition, with specific drugs prescribed upon discharge to continue treatment at home.

Heart disease has become more prevalent as people focus on work and wealth, often at the expense of their health. This lifestyle leads to poor diets, inactivity, and high stress, increasing the risk of conditions like diabetes, high blood pressure, and eventually heart disease. Regular medical check-ups are vital to monitor heart health, as heart disease affects not just the heart but also other organs.

KEYWORDS: *Heart attack, CHF, Heart failure*

INTRODUCTION

Heart disease has become increasingly common today. To live a luxurious life, many people work nonstop to earn more money, often neglecting their health. This leads to unhealthy lifestyle changes, including poor diets, lack of exercise, and high stress levels, which in turn cause conditions like diabetes, high blood pressure, and other diseases at younger ages. Neglecting health increases the risk of heart disease. Since the heart is a vital organ, any issues with it can also affect other major organs, making regular check-ups and doctor's advice crucial for good health and preventing heart problems.

A lack of physical activity is a significant contributor to conditions like prediabetes and heart disease. Many inactive people develop excess body fat, especially abdominal fat, which increases the risk of prediabetes and heart failure.
Staying physically active and managing weight are essential for maintaining heart health and avoiding these health issues

Heart failure, or congestive heart failure, happens when the heart can't pump enough blood to meet the body's needs. This can occur if the heart doesn't fill up with enough blood or if it's too weak to pump effectively. "Heart failure" doesn't mean the heart has stopped working, but it is a serious condition that requires medical attention.

In India, approximately 8–10 million people are affected by heart failure, making it a significant public health issue. This high prevalence is driven by increasing rates of lifestyle-related conditions such as hypertension, diabetes, and obesity, along with a lack of physical activity among many adults

Cardiovascular diseases (CVDs), which include heart failure, account for around 26% of all deaths in India, with CVDs being the leading cause of mortality in the country.
The World Heart Federation and WHO have highlighted the urgent need for preventive measures and better healthcare access to manage these diseases effectively.

Heart failure can develop either suddenly (acute heart failure) or gradually over time as the heart weakens (chronic heart failure). It can impact either the left or right side of the heart, or even both, and each side may be affected by different causes. Common causes of heart failure include other health conditions that damage the heart, such as coronary artery disease, high blood pressure, heart inflammation, cardiomyopathy, or irregular heart rhythms.

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Heart failure may not cause symptoms immediately, but over time, it often leads to fatigue, shortness of breath, and fluid buildup in areas like the legs, abdomen, or neck. It can also harm other organs, like the liver and kidneys, and can lead to additional issues, including pulmonary hypertension, heart valve disease, or even sudden cardiac arrest.

Doctors diagnose heart failure through your medical history, a physical exam, and imaging or blood tests. While heart failure is serious and has no cure, lifestyle changes, medications, certain medical devices, and procedures can help many people manage symptoms and improve their quality of life.

Congestive Heart Failure

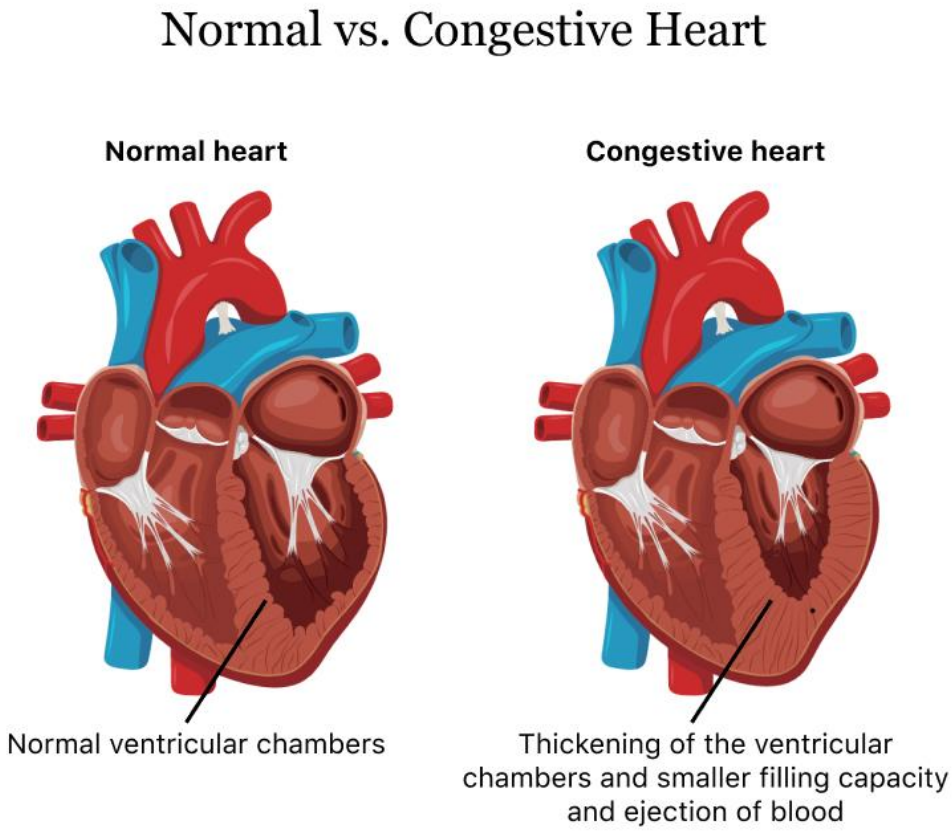


Figure 1 : Shows Differences Between Normal Heart And Congestive Heart

Congestive heart failure, also called heart failure, is a chronic condition where the heart struggles to pump enough blood to meet the body's needs. Despite the name, heart failure doesn't mean the heart has stopped working completely. Instead, it indicates the heart is weakened and can't effectively circulate blood, causing blood and fluid to back up in other parts of the body like the lungs, legs, and feet.

Typically, heart failure can develop due to existing medical conditions that damage the heart, such as coronary artery disease or high blood pressure. Symptoms may start gradually, with patients feeling fatigue, shortness of breath, or noticing fluid buildup in areas like the legs. Because of the heart's reduced function, other organs, like the liver and kidneys, may also be affected.

Congestive heart failure (CHF) is classified into different types based on which part of the heart is affected and how it affects heart function.

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Here are the main types :

1. **Left-Sided Heart Failure**:
   This is the most common type and occurs when the left ventricle, responsible for pumping oxygenated blood to the body, weakens. Left-sided heart failure is further divided into:

- **Heart Failure with Reduced Ejection Fraction (HFrEF)**
  Also known as systolic heart failure, this type happens when the left ventricle can't contract effectively, reducing the amount of blood pumped with each heartbeat.

- **Heart Failure with Preserved Ejection Fraction (HFpEF)**
  Also known as diastolic heart failure, this type occurs when the left ventricle becomes stiff and doesn't fill properly with blood between heartbeats.

2. **Right-Sided Heart Failure**
   This type occurs when the right side of the heart struggles to pump blood to the lungs. It often results from left-sided heart failure because increased pressure from the left side strains the right side, leading to fluid buildup in areas like the legs, abdomen, and liver.

3. **Biventricular Heart Failure**
   This type involves both the left and right sides of the heart and is typically a progression of chronic heart failure. It results in widespread fluid retention and reduced blood flow to various organs.

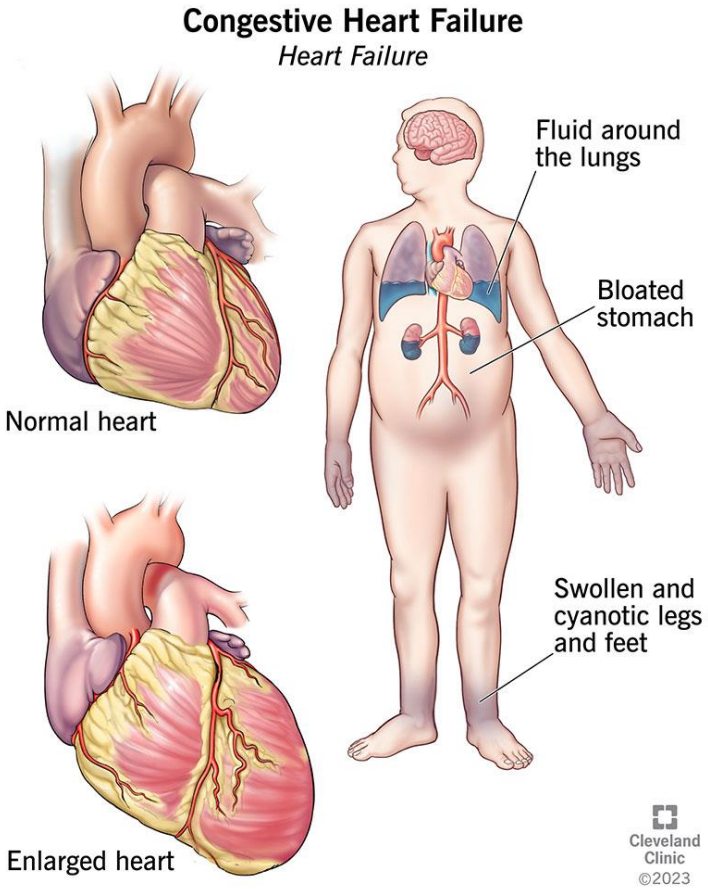


Figure 2: Shows The signs and symptoms of Heart Failure in body by affecting body parts.

Each type of heart failure may have different causes, symptoms, and treatment options. Managing CHF often requires a tailored approach based on the type and severity, as well as lifestyle changes and medications to improve heart function and quality of life.

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Symptoms of Heart Failure

Heart failure symptoms are usually caused by fluid buildup and poor blood circulation. Common symptoms include:

1.Shortness of Breath (Dyspnea)

This often happens during physical activity or when lying down. Fluid can build up in the lungs, making breathing difficult.

2.Fatigue and Weakness

Happen because reduced blood flow to muscles and tissues lowers energy levels and makes it harder to exercise.

3.Swelling (Edema)

This usually occurs in the legs, ankles, and feet due to fluid buildup caused by the heart's weaker pumping ability.

4.Persistent Cough or wheezing

This often produces white or pink-tinged mucus and is caused by fluid buildup in the lungs.

5.Increased need to urinate at night

Called nocturia, this happens when the body tries to remove extra fluid during rest.

6.Rapid or irregular heartbeat (palpitations):

The heart might beat faster to make up for reduced blood flow.

7.Reduced exercise tolerance and chest pain:

Decreased heart function can make physical activity difficult and may cause chest pain, especially in some types of heart failure.

Causes of Heart Failure

Heart failure is often caused by other long-term health conditions and lifestyle factors, including:

1. **Coronary artery disease (CAD)**
   When the coronary arteries narrow, blood flow to the heart decreases, which can lead to heart failure over time.

2. **High blood pressure (hypertension)**
   High blood pressure over time increases the heart's workload, which can eventually weaken and damage the heart muscle.

3. **Heart attack (myocardial infarction)**
   A heart attack damages a portion of the heart muscle, which can reduce its ability to pump blood effectively.

4. **Diabetes**
   It is linked to a higher risk of heart failure due to damage to blood vessels and metabolic strain.

5. **Cardiomyopathy**:
   A disease of the heart muscle caused by genetic factors, alcohol abuse, infections, or other factors that can weaken the heart.

6. **Valvular heart disease**:
   If not treated, faulty heart valves can increase the heart's workload and lead to heart failure.

7. **Excessive alcohol or drug use**:
   Heart muscle damage (cardiomyopathy) from long-term alcohol or drug use can increase the risk of heart failure.

A Case Report

A 62 Year Male Was Admitted In MIT Hospital Under Dr. Tukaram Aute Sir With C/O Acute Onset Of Chest Pain, Profuse Sweating, Breathlessness, Restlessness, Chronic Smoker NO H/O-DM/HTN/COPD Now Patient Is Admitted For CAG .

Table 1.Previous History Of Patient

Sr No.	Name Of Disease
1	Diabetes Mellitus
2	HyperTension
3	Hyperthyroidism

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Table 2. Present Condition of Patients

Sr No.	Symptoms
1	Breathlessness
2	Sweating
3	Chest Pain/Discomfort

Table 3. Personnel Lifestyle

Sr No.	Lifestyle
1	Alcohol
2	Smoking
3	Tobacco
4	Physically Active

Table 4. PrimaryExamination

Sr No.	Examinations
1	Stable
2	Oriented
3	Consciousness
4	Afibrile

Table 5. Systemic Examination

Sr No.	Examinations	Results
1	Cardio Vascular System	S1 S2 +
2	Respiratory System	Clear
3	Central Nervous System	Concious Oriented
4	Per Abdomen	Soft & NT

Examination on Admission
Vital Signs
Normal Range >

Temperature (°C)	Pulse Rate	Respiratory Rate	O Saturation	Blood Pressure
36-37	60-100	16-20	>96%	120/80

Patient Vital Signs >

Temperature (°C)	Heart Rate	Respiratory Rate	O Saturation	Blood Pressure
36.44	78/Min	19/Min	>67%	98/60

CBC – Haematology Profile
Normal Range >

WBC 10^9/uL	RBC 10^12/uL	Haemoglobin Gm/dl
4-10*10^9/uL	4,5-5,5*10^12/L	12-16

Patient's Ranges >

WBC 10^9/uL	RBC 10^12/uL	Haemoglobin Gm/dl
4	4.63	8.6

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Electrolytes
Normal Range >

Albumin	Potassium	Sodium	Chloride
3.5-5.2	3.5-5.3	135-153	0.7-1.2

Patients Range >

Albumin	Potassium	Sodium	Chloride
4.75	4.0	140	1.1

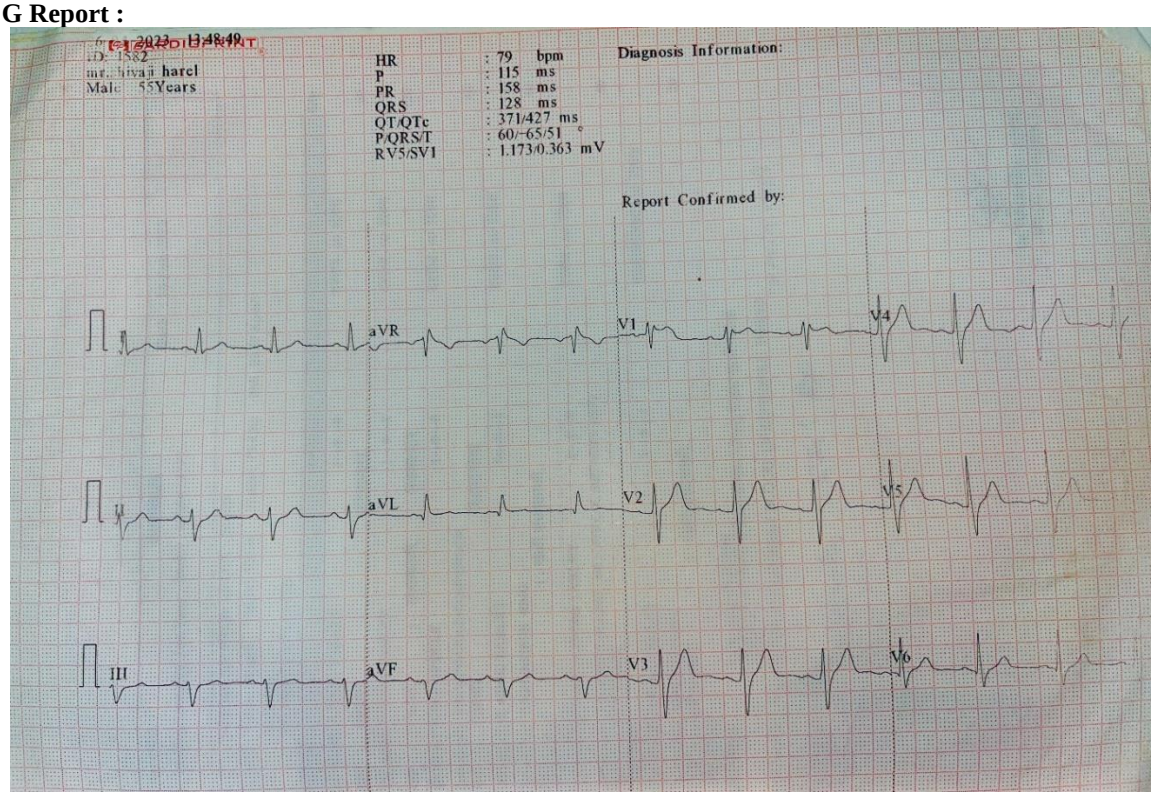
Troponin –

Name	Ng/ml
Troponin-1 (quantitative)	<0.01ng/ml

KFT- Kidney Function Test -

Name	mg/dl
Creatinine	1.33mg/gl
Urea	19.53mg/dl

ECG Report :



CPK-MB (Serum) –

Name	IU/L
CPK-MB	93.63IU/L

Treatment Given –

- NJ HEPARIN 5000 IU
- TAB AOMLOG 5 MG
- INJ TAXIM 1 GM IV
- INJ ECOSPRIN 7.5 MG
- TAB TONACT 40 MG
- TAB PAN 40 MG

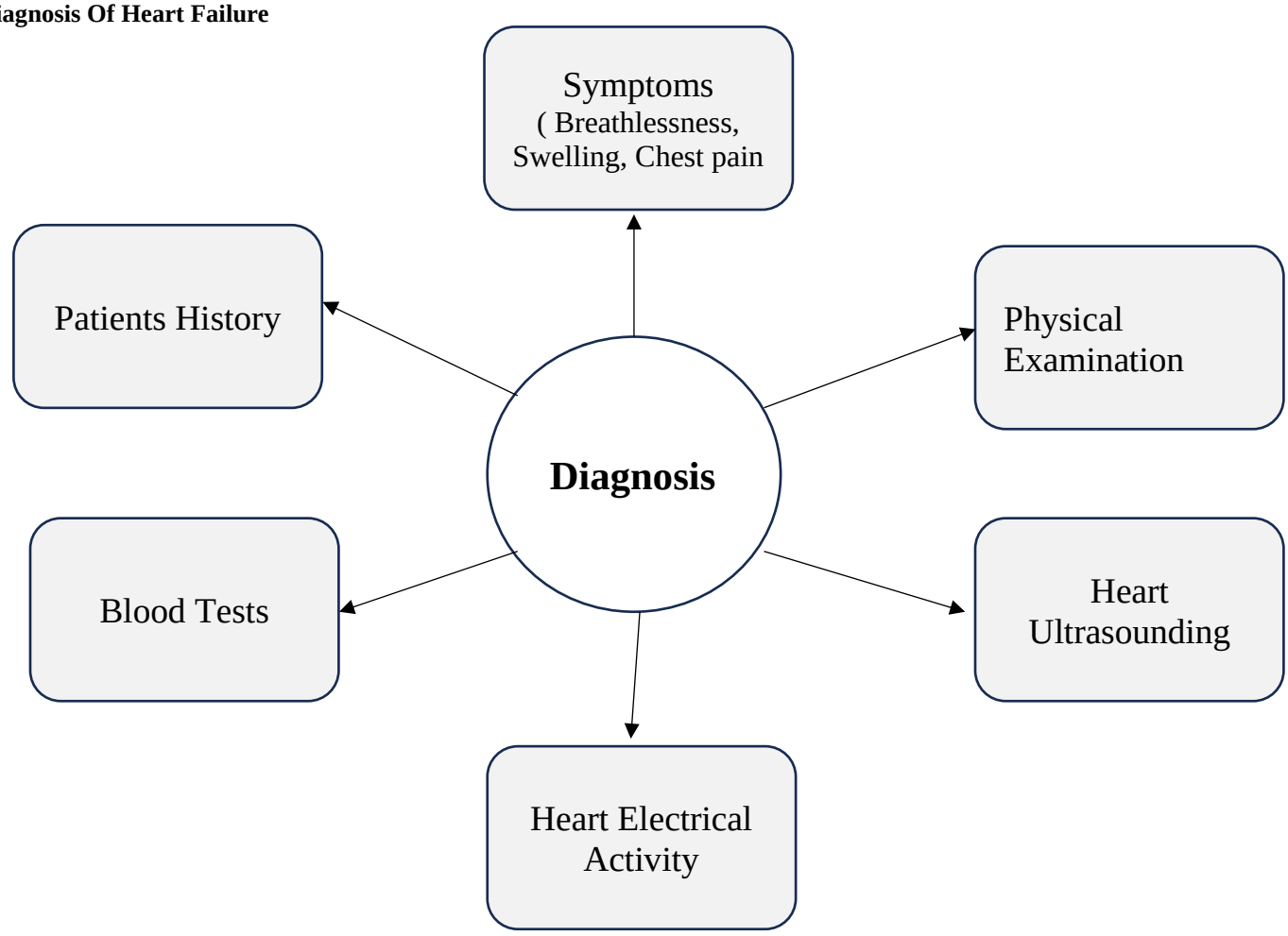
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- TAB NIKORAN 5 MG
- TAB ZAPIZ 0.5 MG
- TAB TAZIOC 40 MG
- TAB IRONEMIC PLUS
- TAB FOLVET 0.5 MG
- TAB MET-XL 25 MG
- SYP DUPHELAC 15 ML
- SYP DEXORANGE 10 M

Drug Treatment On Discharge –

- TAB ECOSPRIN 75 MG
- TAB BRILLINTA 90 MG
- TAB TONACT 40 MG
- TAB PAN 40 MG
- TAB NIKORAN 5 MG
- TAB MET-XL 25
- TAB TELMA 40 MG
- SYP DEXORANGE 10 ML

Diagnosis Of Heart Failure



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Diagnosis of Heart Failure in Simple Terms

1.Medical History and Physical Exam

Doctors ask about symptoms like breathlessness or fatigue and check for risk factors, including high blood pressure or diabetes. They may also examine for fluid buildup in areas like the legs or lungs, which can signal heart failure.

2.Blood Tests

Blood tests measure substances like BNP or NT-proBNP, which tend to be higher when the heart is under strain. Other tests check kidney and liver function and electrolyte levels, as these organs can also be affected by heart failure.

3.Electrocardiogram (ECG)

An ECG records the heart's electrical activity, helping detect issues like irregular heart rhythms, previous heart attacks, or conduction problems that may contribute to heart failure.

4.Chest X-Ray

A chest X-ray helps detect fluid buildup in the lungs, an enlarged heart, or other signs associated with heart failure.

5.Echocardiogram

This ultrasound test provides images of the heart's structure and measures the heart's ejection fraction (EF), showing how effectively it pumps blood. A low EF indicates systolic heart failure, while normal EF with symptoms might mean diastolic heart failure.

6.Stress Test

A stress test measures how the heart functions under physical exertion, which can help detect coronary artery disease, a possible cause of heart failure.

7.Cardiac MRI or CT Scan

MRI or CT scans give detailed images of the heart and can reveal structural issues, scarring, or muscle damage that may be causing or worsening heart failure.

8.Cardiac Catheterization (Coronary Angiography)

A catheter is used to examine blood flow in the heart's arteries, helping identify any blockages or narrowings that could lead to heart failure.

8.Nuclear Heart Scan

In this test, a small amount of radioactive material is used to create images of blood flow in the heart, helping to spot areas with poor blood flow that might affect heart function.

Congestive Heart Failure (CHF) Treatment Approaches

1.Lifestyle Changes

• **Diet:** Reducing salt intake helps control fluid buildup, which is crucial for managing CHF. The American Heart Association advises consuming less than 2,300 mg of sodium per day, ideally under 1,500 mg for heart failure patients.

• **Exercise:** Moderate exercise can strengthen the heart, improve circulation, reduce symptoms. However, it should be done under medical supervision to avoid over Excertion

• **Fluid Management**: Limiting daily fluid intake may help reduce swelling and prevent fluid buildup, especially in advanced CHF cases.

• **Quitting Smoking and Limiting Alcohol:** Smoking damages the heart and blood vessels, while excessive alcohol can weaken heart muscles, worsening CHF symptoms.

2.Medications

• **ACE Inhibitors/ARBs:** Medications like lisinopril and losartan lower blood pressure, improve blood flow, and reduce the heart's workload. They are often prescribed to increase survival rates in CHF.

•**Beta-Blockers:** Drugs like carvedilol and metoprolol lower heart rate and blood pressure, improving heart function.

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•Diuretics: Diuretics like furosemide help remove extra fluid from the body, reducing swelling and fluid buildup in the lungs.

• Aldosterone Antagonists: Medications like spironolactone control fluid retention and are sometimes used alongside other drugs in heart failure.

• Digoxin: This medication strengthens heart contractions and can help control symptoms in severe heart failure.

• Vasodilators: Hydralazine and isosorbide dinitrate widen blood vessels, helping blood flow more easily and reducing strain on the heart.

3.Medical Devices

• Implantable Cardioverter Defibrillator (ICD): An ICD monitors and corrects dangerous heart rhythms by delivering electrical shocks, which can prevent sudden cardiac arrest in high-risk CHF patients.

• Cardiac Resynchronization Therapy (CRT): CRT devices coordinate the left and right ventricles' rhythms, improving heart function in some CHF patients.

• Ventricular Assist Devices (VADs): VADs help pump blood for patients with severe CHF and are sometimes used as a bridge to heart transplant.

4.Surgical Options

• Coronary Artery Bypass Grafting (CABG): CABG surgery bypasses blocked arteries, restoring blood flow to the heart and helping relieve CHF symptoms.

• Heart Valve Surgery: Repairing or replacing damaged heart valves can improve heart function in CHF patients with valvular disease.

• Heart Transplant: For end-stage CHF, a heart transplant may be an option if other treatments are ineffective.

5.Monitoring and Follow-Up

• Regular follow-ups are important for monitoring heart health, adjusting medications, and managing symptoms. Remote monitoring tools, like wearable devices, can detect early signs of worsening conditions, allowing for prompt treatment.

CONCLUSION

This case study of a 55-year-old man highlights how complex and serious congestive heart failure (CHF) can be. The patient, a long-time smoker, came in with chest pain, breathlessness, and sweating. His medical history, including hypertension, diabetes, smoking, and alcohol use, added to his risk for heart disease. Tests showed cardiovascular strain, and his treatment involved medications to support heart function, control fluid buildup, and reduce other risk factors.

This case shows how important lifestyle changes, timely medical care, and regular check-ups are for managing heart failure. CHF management requires a team approach, combining lifestyle adjustments, medications, and sometimes surgery or devices. With effective treatment, CHF patients can have a better quality of life, experience fewer symptoms, and potentially live longer. This case underscores the value of early detection and comprehensive care in managing heart failure.

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