

Case Report

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Case presentation on congestive heart failure

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ABSTRACT

Cardiovascular disease is now become as leading cause of mortality in India. People with the age of above 50 year, having hypertension or diabetes or having social habits will be at a risk of getting cardiovascular disease. Heart failure is a condition where nearly 10% of heart disease patients will be having congestive heart failure. It is of two which is based on the ejection fraction of the blood from the heart. If heart doesn't performs its work efficiently then that effect can be seen in the remaining body organs in this conditions patients complaints about shortness of breath, orthopnoea, chest discomfort and etc. Treatment strategy for the patients will be based on the stage of the disease and severity of the condition. Few innovations has happened in the treatment of the congestive heart failure.

Keywords: HFrEF, HFpEF, NT-proBNP, Inotropic drugs.

INTRODUCTION

Heart pump bloods to all the body parts in and average heart pumps nearly 5-6 litres of blood to all body parts every minute. If heart stops or decreases its working capability then all the problems will start. Congestive heart failure is a condition in which heart losses its ability to pump blood properly to all the organs those required blood it may be due to weaker heart muscle or problems in circulation of the blood. Congestive heart failure is of two types they are Systolic dysfunction and Diastolic Dysfunction.

Systolic dysfunction in this case heart muscle will not contract properly with efficient force which ultimately leads to less amount of blood for body parts by this mechanism it can also be known as heart failure with reduced ejection fraction (HFrEF). [1]

Diastolic dysfunction is a case that is not opposite to systolic dysfunction but in this condition heart ventricles fails to relax properly

which leads to entry of less blood into the Heart during filling well known as Heart failure with preserved ejection fraction (HFpEF). [2]

When heart fails to pump blood properly that leads to activation of the compensatory activity or mechanism by the organs of the body which simply means adjustment by the organ for a condition. For example in normal condition heart pumps nearly 5-6 litres of blood every minute if heart fails its target amount of pumping blood for suppose if the blood pumped is in between 1.5-2.0 litres of blood then compensatory action will start, in case of for kidneys less amount of oxygenated blood will be sent by heart as a result only few amount of the blood will be purified by kidneys and remaining non-purified blood will be present in the body, generally non-purified or impure blood will be having all the waste materials like creatinine, urea and etc. As a result patients will be presenting with the complaint of oedema and in lab values will be raised which are presented in the impure blood. Extra fluid in the circulation raise in the liver, the

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lungs and some other places. [3] Such kind of fluid accumulation is known as "congestion" this condition is called as "congestive heart failure".

Congestive heart failure has been classified into four functional classes they are as

Class I: HF does not cause limitations to physical activity; ordinary physical activity does not cause symptoms.

Class II: HF causes slight limitations to physical activity; the patients are comfortable at rest, but ordinary physical activity results in HF symptoms.

Class III: HF causes marked limitations of physical activity; the patients are comfortable at rest, but less than ordinary activity causes symptoms of HF.

Class IV: HF patients are unable to carry on any physical activity without HF symptoms or have symptoms when at rest.

The American College of Cardiology/American Heart Association (ACC/AHA) staging system is defined by the following four stages:

Stage A: High risk of heart failure, but no structural heart disease or symptoms of heart failure;

Stage B: Structural heart disease, but no symptoms of heart failure;

Stage C: Structural heart disease and symptoms of heart failure;

Stage D: Refractory heart failure requiring specialized interventions.

CASE REPORT

A 49 years old male patient was admitted into hospital with complaints of chest discomfort, Shortness of breath, fever, dry cough and orthopnoea. From past 8 years he is having hypertension, and a year back (2017) he underwent Coronary artery bypass graft for coronary artery disease of triple disease condition. From past 5 years he was on various kinds of anti-hypertensive drugs based on the condition as per the latest

records he is on T. Amlodipine which is a calcium channel blockers class dihydropyridine's group drug. For the management of his cardiac condition he is also using antiplatelet drug that is aspirin of 75mg and HMG-co-A reductase inhibitor drug that is atorvastatin from past one year.

Physical examination has revealed that patient is having oedema of +1 condition of LEE (lower extremities oedema). On day one morning he underwent blood screening in that interpretations values of haemoglobin values are 10.9g/dl, RBC was 3.98 mill/cumm, NT-proBNP - 1866pg/ml (NT-proBNP (N-terminal pro b-type natriuretic peptide) is produced in heart and released when heart is stretched and working hard to pump blood, values increases when left ventricle of heart is stretched, normal values is below 300pg/ml [4]. 2D echo has confirmed that subject is having systolic dysfunction with dilated left ventricle and Ejection fraction was below the normal range that is 30%.

Main goals of the physician was to improve the quality of life and to control further complications of disease. He was prescribed with anti-hypertensive drugs, anti-platelet drugs, and inotropic drugs to control disease condition or progression.

DISCUSSION

Systolic dysfunction is a condition in which left ventricular dysfunction will be observed at first and then ejection fraction will be decreased where subject experience the symptoms of heart failure then body starts compensatory mechanisms in order to meet the body needs, in case of the kidney's activation of the renin angiotensin aldosterone system and the Sympathetic nervous system then fluid retention and vasoconstriction will be done.

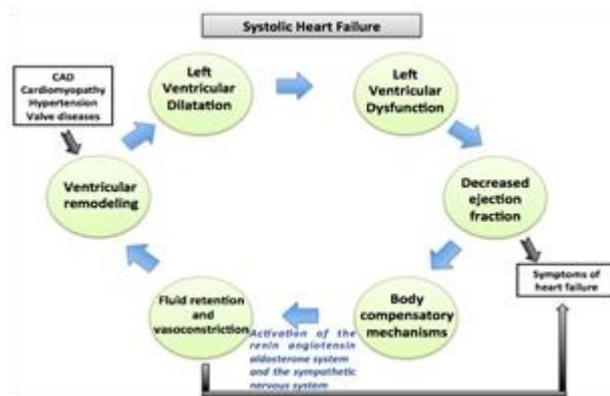


Fig: 1 Pathophysiology of systolic heart failure

So the subjects experience the oedema, chest discomfort, Shortness of breath, fever, dry cough, orthopnoea and some other minor symptoms. Treatment for the congestive heart failure includes inotropic drugs, drugs that shows effects on the angiotensin, beta blockers and etc. medications are suggested in the patients.

The subject admitted in the hospital has diagnosed with the heart failure with reduced ejection fraction as per the diagnostic reports. Subject is advised with ramipril (angiotensin converting enzyme inhibitor), Furosemide loop diuretic, Metoprolol beta blocker, aspirin anti-platelet, atorvastatin HMG-co-A inhibitor, ferrous fumarate iron supplement was prescribed as regular medication to subject as the subject is admitted in the inpatient department. Subject was in hospital for 5 days and dobutamin intravenous was given for 2 days. Even through subject was hospitalised for 2 day, patient is completing about dry cough, it may be because of ramipril is an angiotensin converting enzyme inhibitor which can likely due to the pro-tussive mediators bradykinin and substance P this agents are degraded by ACE and therefore bradykinin accumulate in the lungs this causes dry cough in the patients so in order to control this problem physician advised angiotensin receptor blocker drugs olmesartan [5]. later lab investigations has showed decrease in the potassium value, It can be because subject is receiving only potent loop diuretic which has a capacity of causing electrolyte depletion in order to compensate this spironolactone also given it is a potassium sparing diuretic this helps in preventing the loss of the electrolyte from this body, advised for 2-3 days. Patient complains about leg pains and weakness at the time of discharge physician has advised livogen. In case of congestive heart failure

patient do received inotropic drugs like dobutamin and etc. inotropic are of two types those are positive inotropic and negative inotropic: positive inotropic drugs are those which can increase heart beats examples digoxin, amiodarone, calcium supplements. Negative inotropic drugs are those which decrease beta-blockers, calcium channel blockers. General recommended approach for the use of inotropic in patients with acute heart failure exacebaration. In case of well perfused patients with impaired functional capacity and frequent hospitalizations for HF exacerbation may be benefit. In patients who are hospitalized with worsening cardiorenal syndrome regardless of intravenous diuretic and vasodilator therapy, it would be sensible to add an inotrope in an try in order to rescue renal function. If patients are hospitalized with clinical proof of shock, inotropic support is clearly indicated as a temporary measure until stabilized on oral agents or other treatment strategies. And later patient will be advised with the beta blocker in order to stabilize the patient condition so, while discharge physician advised metoprolol. [6]

While concurrent use of aspirin with furosemide will cause reduce in the diuretic effectiveness and chance of nephrotoxicity is high. Monitoring the sr. electrolytes, blood pressure and sr. creatinine is important in this patient because some of the drugs which are prescribed can cause elevation or decrease in the values. Discharge medications are metoprolol 50mg, olmesartan 40mg, atorvastatin 40mg, livogen, ecosprin 150 mg was given.

Life style changes has advised those are stop smoking and alcohol consumption, reduce stress which is an indirect triggering factor for heart

problems, lose weight, limit fluid intake, reduce salt intake, increase high fiber diet.

CONCLUSION

Treatment strategy for congestive heart failure can be based on the severity of the disease condition surgeon do perform surgeries like angioplasty to open a blocked artery, coronary artery bypass surgery, valve replacement surgery, heart transplant, and etc. technique can be performed. Research is go on the stem cell therapy treatment for congestive heart failure patients they found that human umbilical cord tissue derived mesenchymal stem cells are considered as the major source for research actually HUCT mesenchymal stem cells are immune system affluent, cell rejection is not an issue and Human Leukocyte Antigen (HLA) matching is not necessary. The stem cells with the best anti-inflammatory activity, immune modulating capacity, and ability to stimulate regeneration can be screened and selected. Allogeneic stem cells can be administered multiple times over the course of days in uniform dosages that contain high cell counts.

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