Ayurveda management of heart failure with low ejection fraction with shamana chikitsa: A case report

Om Prakash Lekhrao[1], Sumit Nathani[2]
[1]MD Scholar, Dept. of Dravyaguna Vigyana, National Institute of Ayurveda, Jaipur
[2]Associate Professor & Guide, Dept. of Dravyaguna Vigyana, National Institute of Ayurveda, Jaipur

***Abstract*—Background:The heart, regarded in *Ayurveda* as a vital organ responsible for the circulation of *Rasa* (nutrient essence), requires careful preservation to prevent dysfunction. *Ayurveda* emphasizes stress reduction and a heart-supportive diet as central to maintaining cardiovascular health. This paper explores the *Ayurvedic* perspective on heart failure with reduced ejection fraction (HFrEF). Low ejection fraction (EF), defined as EF below 55%, signifies impaired cardiac efficiency. Heart failure is a leading contributor to premature mortality due to cardiac dysfunction. According to *Ayurveda* principles, heart dysfunction primarily stems from impaired *Rasadhatvagni* (digestive/metabolic function of the *Rasa Dhatu*), leading to the formation of poor-quality *Rasa Dhatu*, which, when accumulated, adversely affects cardiac function.**

Case Presentation:This case report presents a 47-year-old male diagnosed with heart failure with reduced ejection fraction (LVEF 23%), attributed to defective *Rasa Dhatu* formation. The patient was treated with a *shaman chikitsa* aimed at improving both systolic and diastolic cardiac function. These formulations were selected based on their *Hridya* (cardiotonic), *Rasayana* (rejuvenative), and *Agni-deepana* (digestive fire-enhancing) properties.

Results:The patient showed marked clinical and echocardiographic improvement. The LVEF improved from 23% to 35%, along with normalization of pulmonary artery pressure, improved right ventricular function, and reduction in pericardial effusion. The findings suggest that correction of *Rasa Dhatu* quality through *Ayurvedic* interventions contributed to the improvement in cardiac function.

Conclusion:This case highlights the potential of *Ayurvedic* interventions specifically targeted shaman *chikitsa* in improving cardiac function in patients with low ejection fraction. *Ayurveda* offers a scientifically grounded and holistic approach that can be used either as a standalone therapy or as an adjunct to conventional cardiology practices.

Index Terms*—Heart failure,low ejaction fraction,*shamana chikitsa,Ayurveda

I. INTRODUCTION

Heart failure (HF) is a complex clinical syndrome affecting approximately 2% of the adult population worldwide and remains a leading cause of early morbidity and mortality. Despite advancements in pharmacological and instrumental therapies, chronic heart failure continues to carry a significant burden. The first-year mortality rate among hospitalized patients with acute decompensated heart failure can be as high as 25%. [1]Furthermore, the prognosis for patients who develop cardiogenic shock following acute myocardial infarction has not improved substantially over the past two decades, even with the advent of reperfusion therapies and mechanical circulatory support (MCS) [2,3].

In *Ayurveda* medicine, heart failure is considered a *Tridoshaja Vyadhi*, involving the imbalance of all three *doshas* (*Vata, Pitta, and Kapha*), and is often linked to impaired *Rasa Dhatu* metabolism and dysfunction of *Rasadhatvagni.* While modern management of HF has advanced considerably, outcomes in terms of patient survival and quality of life remain suboptimal.

Recent clinical trials have explored the role of *Ayurveda* interventions as adjunct therapies in the management of heart failure. Several herbal formulations possess documented antioxidant, anti-inflammatory, antiplatelet, and hypolipidemic properties, which may be beneficial in improving cardiac function and reducing cardiovascular risk[4,5] . However, more clinical evidence is needed to substantiate their therapeutic potential in routine practice.

This case report presents the integrated management of heart failure with reduced ejection fraction in a 47-year-old male patient with associated comorbidities. It managed exclusively with *Ayurveda* interventions and

lifestyle modifications for 9 months; the patient was subsequently treated exclusively with *Ayurveda* interventions and lifestyle modifications. This treatment was administered at the National Institute of *Ayurveda,* Jaipur, and led to notable clinical and echocardiographic improvements, underscoring the potential of *Ayurveda* in managing heart failure with low ejection fraction.

Case Report:

A 47-year-old male patient presented to the Outpatient Department of *Dravyaguna Vigyana*, National Institute of *Ayurveda*, Jaipur, on 25-07-2024 with chief complaints of breathlessness, reduced appetite, vertigo, generalized body ache, and bilateral pedal edema, all persisting for approximately one month.

At the time of presentation, his vital signs were as follows:

Weight: 72 kg
Temperature: 98.4ºF
Respiratory Rate: 22 breaths per minute
Blood Pressure: 140/90 mmHg
Pulse Rate: 64 beats per minute

Physical Examination

General examination revealed the presence of a coated tongue and bilateral pitting edema of the feet. However, there was no pallor, cyanosis, or clubbing observed.

Central Nervous System (CNS): Patient was drowsy but responsive.

Cardiovascular System (CVS): Heart sounds S1 and S2 were audible; a loud murmur was noted.

Respiratory System (RS): Bilateral air entry was noted.

Per Abdomen (PA): Abdomen was soft and non-tender.

Cardiac Rhythm: Sinus rhythm was observed.

The patient had no prior history of heart failure or significant cardiac illness.

Investigations

Echocardiography revealed significant systolic and diastolic dysfunction, with a left ventricular ejection fraction (LVEF) of 23 ± 3%, indicating severe LV systolic dysfunction.

Treatment Protocol:

During the course of treatment, the patient was placed on a structured integrative regimen that included *Ayurveda* medications, dietary modifications, lifestyle interventions, a disciplined daily routine (*Dinacharya)*, and *yoga* therapy.

Diet and Lifestyle

The patient was advised to follow a regulated daily routine (*Dinacharya*) with fixed meal timings and specific dietary restrictions. Meals were limited to two per day:

First meal: Between 9:00 a.m. and 11:00 a.m.
Second meal: Between 6:00 p.m. and 8:00 p.m.

The following dietary guidelines were strictly followed:

A potassium-rich diet, including ample fresh fruits and vegetables.

Elimination of junk, fast, fermented, fried, and heavy oily foods.

Avoidance of high-sodium items such as potatoes and processed foods.

In addition, the patient was advised to engage in light physical activities and follow a *yoga* routine designed for cardiac rehabilitation. The *yoga* regimen included gentle *asanas, pranayama* (breathing techniques), and relaxation practices to improve parasympathetic tone, support emotional balance, and reduce cardiac stress.

Ayurvedic Medications

The following herbs and formulations were administered to support cardiac function, enhance *Rasa Dhatu* metabolism, and restore *Dosha* equilibrium associated with heart dysfunction:

1. *Arjunarishtha*[6,7]

Dosage: 20 ml twice daily after meals, with an equal quantity of plain water

Properties: *Hridya* (cardiotonic), *Kaphavataghna, Rasayana*

Mechanism: Strengthens cardiac musculature, improves coronary perfusion, and enhances left ventricular systolic function.

2. *Amritadi Guggulu* [8]

Dosage: 1 g twice daily after meals

Properties: *Tridoshahara, Lekhana, Raktashodhaka*

Mechanism: Aids in reducing lipid levels, supports metabolic detoxification, and modulates vascular inflammation.

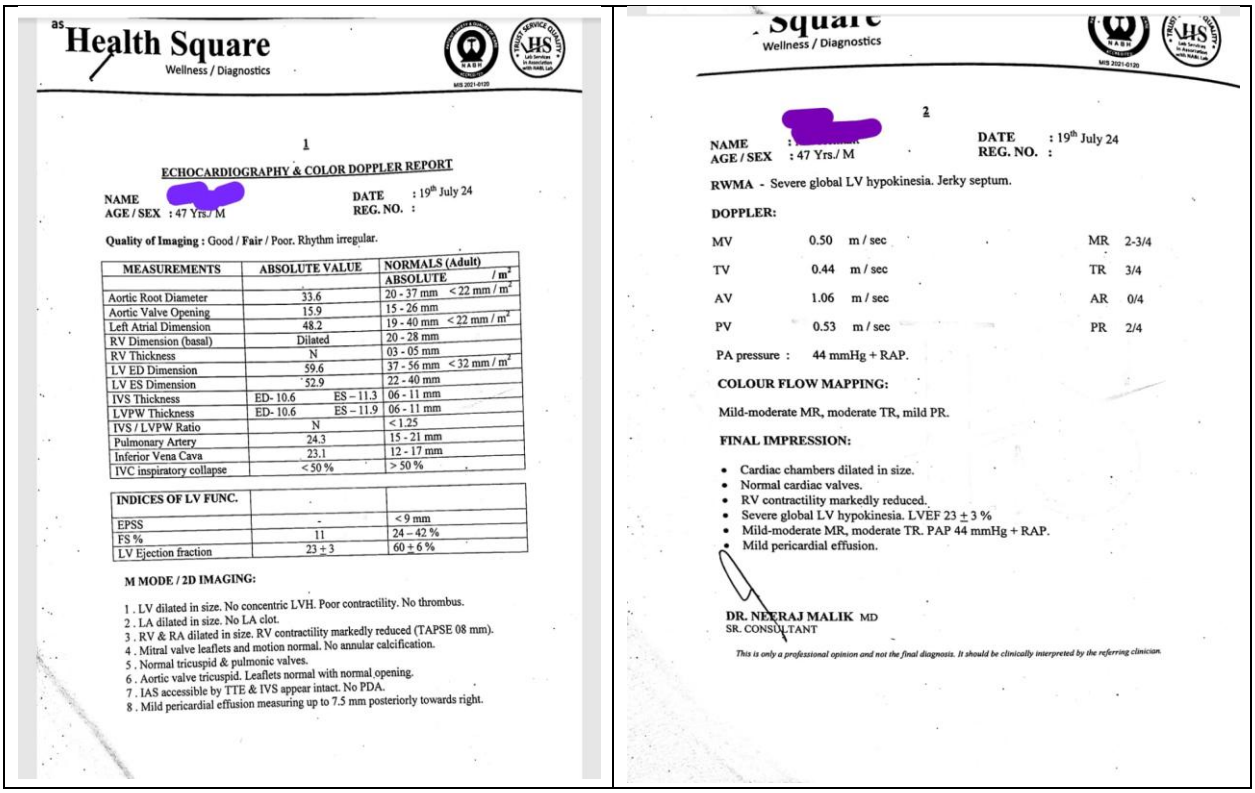
3. *Ashwagandha* powder *(Withania somnifera)*[9]

Dosage: 1 g twice daily after meals
Properties: *Balya, Rasayana, Medhya*
Mechanism: Acts as an adaptogen, improves muscle strength, reduces cortisol levels, and supports myocardial recovery.
4. *Tambula Patra* (Betel Leaf)[10]
Dosage: 1 fresh leaf, twice daily after meals
Properties: *Dipana, Hridya, Krimighna*
Mechanism: Enhances digestion, reduces *Ama* (metabolic waste), supports vascular tone, and aids peripheral circulation.
5. *Shuddha Shilajit*[11]
Dosage: 125 mg once daily
Properties: *Rasayana, Balya, Agnideepana*
Mechanism: Boosts mitochondrial function, enhances physical stamina, and strengthens cardiac endurance.
These medications were carefully chosen based on classical *Ayurveda* references and customized according to the patient's individual constitution (*Prakriti*), digestive status (*Agni)*, tissue channel involvement (*Srotodushti*), and derangement of *Rasa Dhatu.*

Follow- up and outcome:
The patient was assessed at regular follow-up visits, and symptoms were monitored throughout the nine months treatment period.

II. OBSERVATION AND RESULTS

Symptoms	Before treatment	After nine months of treatment
breathlessness	severe	absent
vertigo	present	absent
Bilateral pedal edema	present	absent
Reduced appetite	present	Normal
Generalized body ache	present	absent



Health Square
Wellness / Diagnostics

1

ECHOCARDIOGRAPHY & COLOR DOPPLER REPORT

NAME [redacted]
AGE / SEX : 47 Yrs./ M

DATE : 19th July 24
REG. NO. :

Quality of Imaging : Good / Fair / Poor. Rhythm irregular.

MEASUREMENTS	ABSOLUTE VALUE	NORMALS (Adult) ABSOLUTE / m^2
Aortic Root Diameter	33.6	20 - 37 mm / < 22 mm / m^2
Aortic Valve Opening	15.9	15 - 26 mm
Left Atrial Dimension	48.2	19 - 40 mm / < 22 mm / m^2
RV Dimension (basal)	Dilated	20 - 28 mm
RV Thickness	N	03 - 05 mm
LV ED Dimension	59.6	37 - 56 mm / < 32 mm / m^2
LV ES Dimension	52.9	22 - 40 mm
IVS Thickness	ED- 10.6 ES – 11.3	06 - 11 mm
LVPW Thickness	ED- 10.6 ES – 11.9	06 - 11 mm
IVS / LVPW Ratio	N	< 1.25
Pulmonary Artery	24.3	15 - 21 mm
Inferior Vena Cava	23.1	12 - 17 mm
IVC inspiratory collapse	< 50 %	> 50 %

INDICES OF LV FUNC.		
EPSS	-	< 9 mm
FS %	11	24 – 42 %
LV Ejection fraction	23 ± 3	60 ± 6 %

M MODE / 2D IMAGING:

1 . LV dilated in size. No concentric LVH. Poor contractility. No thrombus.
2 . LA dilated in size. No LA clot.
3 . RV & RA dilated in size. RV contractility markedly reduced (TAPSE 08 mm).
4 . Mitral valve leaflets and motion normal. No annular calcification.
5 . Normal tricuspid & pulmonic valves.
6 . Aortic valve tricuspid. Leaflets normal with normal opening.
7 . IAS accessible by TTE & IVS appear intact. No PDA.
8 . Mild pericardial effusion measuring up to 7.5 mm posteriorly towards right.

Wellness / Diagnostics

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NAME [redacted]
AGE / SEX : 47 Yrs./ M

DATE : 19th July 24
REG. NO. :

RWMA - Severe global LV hypokinesia. Jerky septum.

DOPPLER:

MV	0.50 m / sec	MR	2-3/4
TV	0.44 m / sec	TR	3/4
AV	1.06 m / sec	AR	0/4
PV	0.53 m / sec	PR	2/4

PA pressure : 44 mmHg + RAP.

COLOUR FLOW MAPPING:

Mild-moderate MR, moderate TR, mild PR.

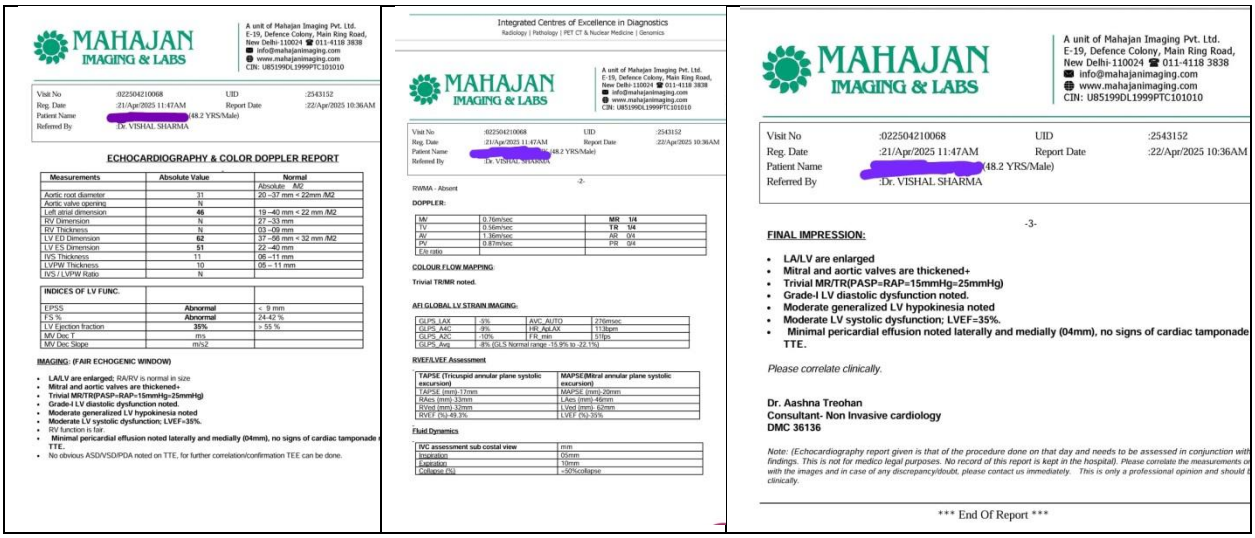
FINAL IMPRESSION:

- Cardiac chambers dilated in size.
- Normal cardiac valves.
- RV contractility markedly reduced.
- Severe global LV hypokinesia. LVEF 23 ± 3 %
- Mild-moderate MR, moderate TR. PAP 44 mmHg + RAP.
- Mild pericardial effusion.

DR. NEERAJ MALIK MD
SR. CONSULTANT

This is only a professional opinion and not the final diagnosis. It should be clinically interpreted by the referring clinician.

Before treatment



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Visit No :022504210068 UID :2543152
Reg. Date :21/Apr/2025 11:47AM Report Date :22/Apr/2025 10:36AM
Patient Name [redacted] (48.2 YRS/Male)
Referred By :Dr. VISHAL SHARMA

ECHOCARDIOGRAPHY & COLOR DOPPLER REPORT

Measurements	Absolute Value	Normal
		Absolute AVI
Aortic root diameter	31	20 –37 mm < 22mm /M2
Aortic valve opening	N	
Left atrial dimension	46	19 –40 mm < 22 mm /M2
RV Dimension	N	27 –33 mm
RV Thickness	N	03 –09 mm
LV ED Dimension	62	37 –66 mm < 32 mm /M2
LV ES Dimension	51	22 –40 mm
IVS Thickness	11	06 –11 mm
LVPW Thickness	10	05 – 11 mm
IVS / LVPW Ratio	N	

INDICES OF LV FUNC.

EPSS	Abnormal	< 9 mm
FS %	Abnormal	24-42 %
LV Ejection fraction	35%	> 55 %
MV Dec T	m/s	
MV Dec Slope	m/s2	

IMAGING: (FAIR ECHOGENIC WINDOW)

- **LA/LV are enlarged;** RA/RV is normal in size
- **Mitral and aortic valves are thickened+**
- **Trivial MR/TR(PASP=RAP=15mmHg-25mmHg)**
- **Grade-I LV diastolic dysfunction noted.**
- **Moderate generalized LV hypokinesia noted**
- **Moderate LV systolic dysfunction; LVEF=35%.**
- RV function is fair.
- **Minimal pericardial effusion noted laterally and medially (04mm), no signs of cardiac tamponade TTE.**
- No obvious ASD/VSD/PDA noted on TTE, for further correlation/confirmation TEE can be done.

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RWMA - Absent

DOPPLER:

MV	0.76m/sec	MR 1/4	
TV	0.36m/sec	TR 1/4	
AV	1.36m/sec	AR 0/4	
PV	0.87m/sec	PR 0/4	
E/e ratio			

COLOUR FLOW MAPPING:

Trivial TR/MR noted.

AFI GLOBAL LV STRAIN IMAGING:

GLPS_LAX	-5%	AVC_AUTO	270msec
GLPS_A4C	-9%	HR_ApLAX	113bpm
GLPS_A2C	-10%	FR_min	51fps
GLPS_Avg	-8% (GLS Normal range -15.9% to -22.1%)		

RVEF/LVEF Assessment

TAPSE (Tricuspid annular plane systolic excursion)	MAPSE(Mitral annular plane systolic excursion)
TAPSE (mm)-17mm	MAPSE (mm)-20mm
RAes (mm)-32mm	LAes (mm)-46mm
RVed (mm)-32mm	LVed (mm)- 62mm
RVEF (%)-49.3%	LVEF (%)-35%

Fluid Dynamics

IVC assessment sub costal view	mm
Inspiration	05mm
Expiration	10mm
Collapse (%)	~50%collapse

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Referred By :Dr. VISHAL SHARMA

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FINAL IMPRESSION:

- **LA/LV are enlarged**
- **Mitral and aortic valves are thickened+**
- **Trivial MR/TR(PASP=RAP=15mmHg=25mmHg)**
- **Grade-I LV diastolic dysfunction noted.**
- **Moderate generalized LV hypokinesia noted**
- **Moderate LV systolic dysfunction; LVEF=35%.**
- **Minimal pericardial effusion noted laterally and medially (04mm), no signs of cardiac tamponade TTE.**

Please correlate clinically.

Dr. Aashna Treohan
Consultant- Non Invasive cardiology
DMC 36136

Note: (Echocardiography report given is that of the procedure done on that day and needs to be assessed in conjunction with findings. This is not for medico legal purposes. No record of this report is kept in the hospital). Please correlate the measurements with the images and in case of any discrepancy/doubt, please contact us immediately. This is only a professional opinion and should clinically.

*** End Of Report ***

After treatment (nine months)

Comparative Echocardiography Report: Before and After Treatment

The echocardiographic evaluation before and after treatment shows significant improvement in overall cardiac function, with some residual structural changes. Below is a comparative analysis in narrative form:

Left Ventricle (LV)

Before treatment, the left ventricle was dilated in size with severe global hypokinesia, and the left ventricular ejection fraction (LVEF) was markedly reduced to 23 ± 3%, indicating severe systolic dysfunction. After treatment, the LV remained enlarged, but there was notable improvement in systolic function. The LVEF improved to 35%, suggesting moderate systolic dysfunction. Contractility also improved, changing from severe to moderate global hypokinesia. Additionally, Grade I diastolic dysfunction was noted post-treatment, indicating mild residual diastolic impairment that was not previously documented.

Left Atrium (LA)

Initially, the left atrium was dilated with no thrombus observed. Post-treatment, it remained enlarged, but no further complications such as clot formation were reported. This suggests a stable structural change without acute pathology.

Right Ventricle (RV) and Right Atrium (RA)

Prior to treatment, both the right atrium and right ventricle were dilated. The RV showed markedly reduced contractility, with TAPSE (tricuspid annular plane systolic excursion) measured at only 8 mm, indicating severely impaired right ventricular function. After treatment, the sizes of both RA and RV returned to normal, and RV function improved to a fair level. This reflects a positive response in right heart dynamics.

Valvular Findings

Initially, the mitral and aortic valves showed normal leaflet motion and structure, while the tricuspid and pulmonary valves appeared normal as well. Mild to moderate mitral regurgitation and moderate tricuspid regurgitation were observed. After treatment, the mitral and aortic valves appeared thickened, suggesting mild structural change or degenerative alteration. However, the degree of regurgitation significantly reduced to trivial mitral and tricuspid regurgitation, indicating improved valvular competence.

Pulmonary Artery Pressure (PAP)

Before treatment, pulmonary artery pressure was elevated at 44 mmHg plus right atrial pressure, reflecting moderate pulmonary hypertension. After treatment, the pulmonary artery systolic pressure decreased to 25 mmHg (PASP = RAP = 15 + 10 mmHg), which is within normal limits. This suggests significant relief in pulmonary pressures likely due to improved ventricular function and reduced regurgitant volume.

Pericardial Effusion

A mild pericardial effusion measuring up to 7.5 mm posteriorly toward the right was noted before treatment. After treatment, only a minimal effusion was seen, measuring approximately 4 mm laterally and medially, with no signs of cardiac tamponade.

This indicates a reduction in pericardial fluid and no hemodynamic compromise.

Septal Integrity and Congenital Defects

Throughout both evaluations, the interatrial and interventricular septa appeared intact, with no signs of atrial septal defect (ASD), ventricular septal defect (VSD), or patent ductus arteriosus (PDA). While the transthoracic echocardiogram (TTE) findings were negative for such defects, a transesophageal echocardiogram (TEE) was suggested for confirmation, especially if clinically indicated.

Overall Interpretation

There has been a notable improvement in cardiac function following treatment. The LVEF improved from 23% to 35%, indicating enhanced left ventricular systolic function. Right ventricular function recovered significantly, and the chamber dilatation in RA and RV resolved. Valvular regurgitations diminished, and pulmonary artery pressure normalized, reflecting reduced cardiac strain. Pericardial effusion also decreased, suggesting improved pericardial dynamics. However, left atrial and left ventricular enlargement persisted, and mild structural changes in the mitral and aortic valves were observed. A low-grade diastolic dysfunction also became apparent. These residual findings warrant continued follow-up but do not overshadow the substantial clinical and echocardiographic improvements achieved with treatment.

III. RESULT AND DISCUSSION

1. *Arjunarishtha*

Main Ingredient: *Terminalia arjuna*

Used as: Cardiac tonic (*Hridya), Rasayana*

Rasa: Kashaya (astringent), *Tikta* (bitter)

Guna: Laghu (light), *Ruksha* (dry)

Virya: Sheeta (cold)

Vipaka: Katu (pungent)

Karma:Hridya (cardiotonic), *Rakta Shodhaka* (blood purifier), *Deepana* (appetizer), *Balya* (strength-giving),*Rasayana* (rejuvenator)

Relevance to HFrEF:

Improves cardiac contractility,Reduces myocardial ischemia,Acts as antioxidant and hypolipidemic

2. *Amritadi Guggulu*

Key Ingredients: *Guduchi (Amrita), Guggulu, Triphala*, etc.

Primarily used in inflammatory conditions, chronic systemic disorders, and *rasayana* therapy.

Rasa: Tikta (bitter), *Kashaya* (astringent), *Katu* (pungent)

Guna: Laghu (light), *Ruksha* (dry), *Tikshna* (penetrating)

Virya: Ushna (hot)

Vipaka: Katu

Karma:Rasayana (rejuvenator), *Lekhana* (scraping lipid plaques), *Ama-pachana* (removes endotoxins),*Medohara* (anti-obesity). *Hridya* (supports heart)

Relevance to HFrEF:

Reduces lipid-related atherosclerosis,Enhances microcirculation and metabolism,Modulates immune inflammation

3. *Ashwagandha (Withania somnifera)*

Used as: *Rasayana*, adaptogen, *medhya*

Rasa: Madhura (sweet), *Tikta* (bitter)

Guna: Guru (heavy), *Snigdha* (unctuous)

Virya: Ushna (hot)

Vipaka: Madhura

Karma:Balya (strength-giving),*Rasayana* (rejuvenator), *Hridya* (cardiac tonic), *Medhya* (neurotonic),*Brimhana* (nourishing)

Relevance to HFrEF:

Reduces stress and cardiac workload,Improves cardiac muscle tone,Enhances mitochondrial energy and tissue oxygenation

4. *Tambula Patra* (Piper betle – Betel leaf)

Traditionally used in: digestion, circulation, local stimulation

Rasa: Katu (pungent), *Tikta* (bitter)

Guna: Laghu (light), *Tikshna* (sharp), *Ruksha* (dry)

Virya: Ushna (hot)

Vipaka: Katu

Karma:Hridya (cardiac stimulant), *Vata-kaphahara,Deepana* (appetizer),*Krimighna* (antimicrobial)

Relevance to HFrEF:Acts as cardiac stimulant,Improves peripheral circulation,Reduces *Kapha*-induced fluid retention

5. *Shuddha Shilajit*

Used in: *Rasayana* therapy, metabolic and urogenital conditions

Rasa: Tikta (bitter), *Katu* (pungent)

Guna: Laghu (light), *Ruksha* (dry)

Virya: Ushna (hot)

Vipaka: Katu

Karma:Rasayana (rejuvenator),*Yogavahi* (enhancer of drug delivery), *Hridya* (supports heart function),*Medohara* (lipid-modulator), *Balya* (strength promoter)

Relevance to HFrEF:Enhances cellular ATP production,Improves myocardial endurance,Removes oxidative stress.

So, it can be considered that these medicines by the above-mentioned properties, breaks down the *Samprapti* (pathogenesis) of the disease heart failure with low ejaction & fraction and improves the diseased condition.

IV. CONCLUSION

According to *Ayurveda* principles, dysfunction of *Rasadhatvagni* leads to the formation of poor-quality *Rasa Dhatu,* which can become a key factor in the pathogenesis of heart disorders. In the present case, impaired *Rasa Dhatu* was identified as the underlying cause of heart failure with reduced ejection fraction (HFrEF).

The *Ayurveda* management, particularly through *Shamana Chikitsa* using selected cardioprotective herbs, showed promising results in improving both systolic and diastolic dysfunction. The herbal formulations prescribed in this case played a pivotal role in restoring cardiac function, enhancing *Rasadhatu* quality, and strengthening the heart muscle through their *Hridya, Rasayana*, and *Tridoshahara* properties.

This case report highlights the therapeutic potential of *Ayurveda* interventions in managing heart failure and suggests that patients with HFrEF can benefit significantly from adjunctive cardiac support offered by herbal medicine. Furthermore, it underscores the importance of individualized treatment approaches based on *Ayurveda* diagnostics.

The outcomes of this case support the view that *Ayurveda* is a well-established, evidence-informed system of medicine with a strong theoretical foundation and practical applicability. It can serve as an effective stand-alone or integrative approach alongside conventional medical care for complex conditions like heart failure.

This report may serve as a valuable reference for *Ayurveda* practitioners, students, researchers, and integrative health professionals committed to exploring holistic and patient-centered cardiovascular care.

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