# PERIPARTUM CARDIOMYOPATHY (PPCM)

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# CASE SCENERIO

A woman 29 yrs old admitted to ICU through emergency

With complaints of severe dyspnea and fatigue on 2nd puerperal day of her first pregnancy without h/o of any this type of symptoms before and delivery was uneventful. She had no h/o of repeated respiratory tract infection and previous hospital admission.

On examination pt is afebrile, BP-140/80mmHg, pulse-90beat/min,

regular, R/R-25/min, 02 saturation-80% without 02, JVP-normal, lungs-

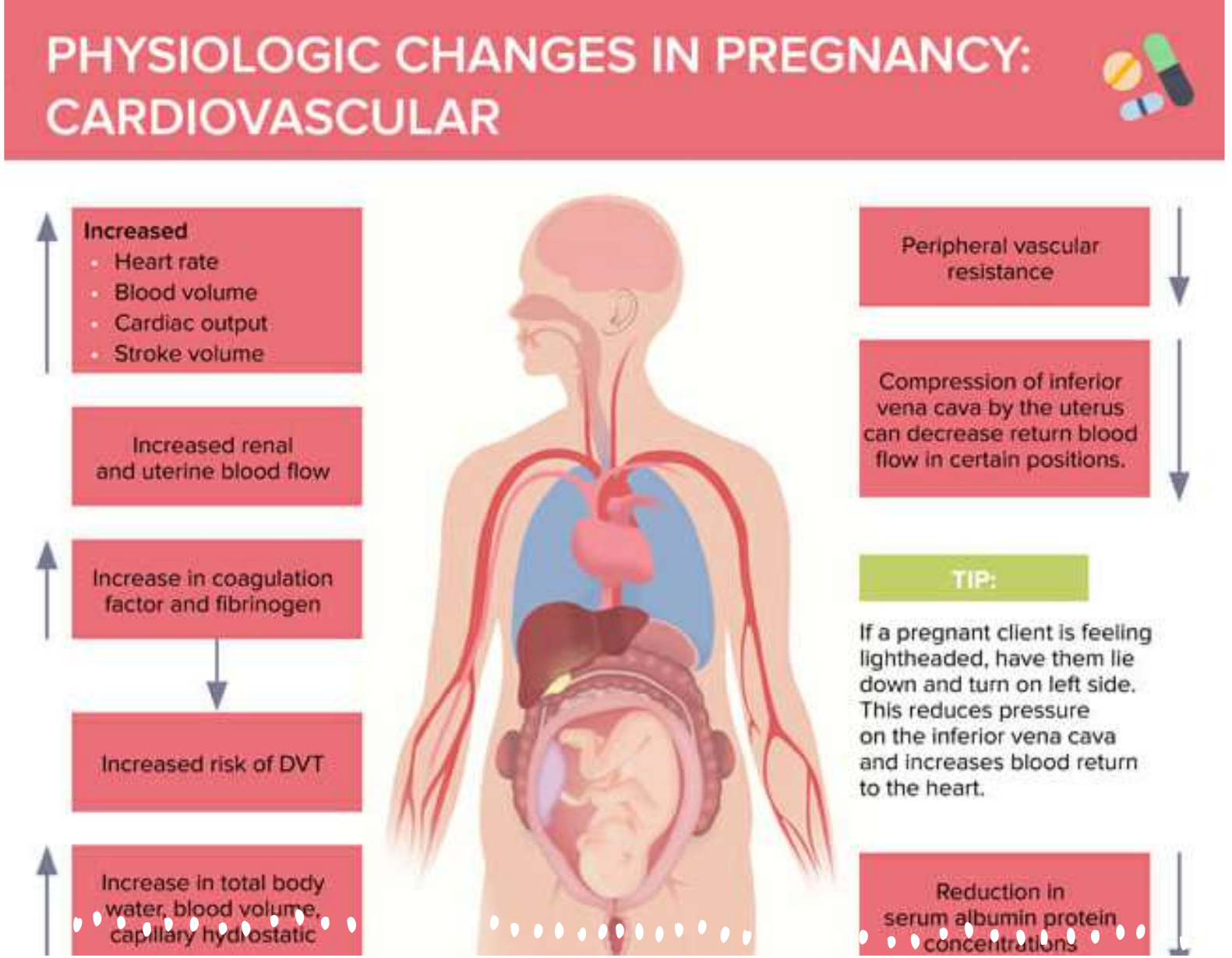
bilateral basal crepitation, heart- 1st and 2nd heart sound normal, S3

gallop present, oedema- moderate, NT-pro BNP- 864pg/ml

-ECG shows sinus tachycardia,

-Chest ray shows cardiomegaly with increase bilateral congestion,

- A transthoracic echocardiogram done at admission showed an LV ejection fraction of 35% to 40%, with trace aortic and mitral regurgitation.




# PHYSIOLOGICAL CHANGES IN PREGNANCY

# What is peripartum cardiomyopathy?

-PPCM is defined as an idiopathic cardiomyopathy that presents with heart failure secondary to left ventricular (LV) systolic dysfunction toward the end of pregnancy or in the months after delivery, in the absence of any other cause of heart failure.

-This is a diagnosis of exclusion, and the majority are diagnosed postpartum

It is associated with all four of the following:

1. Heart failure within: last month of pregnancy - 5 months postpartum

2. Absence of prior heart disease

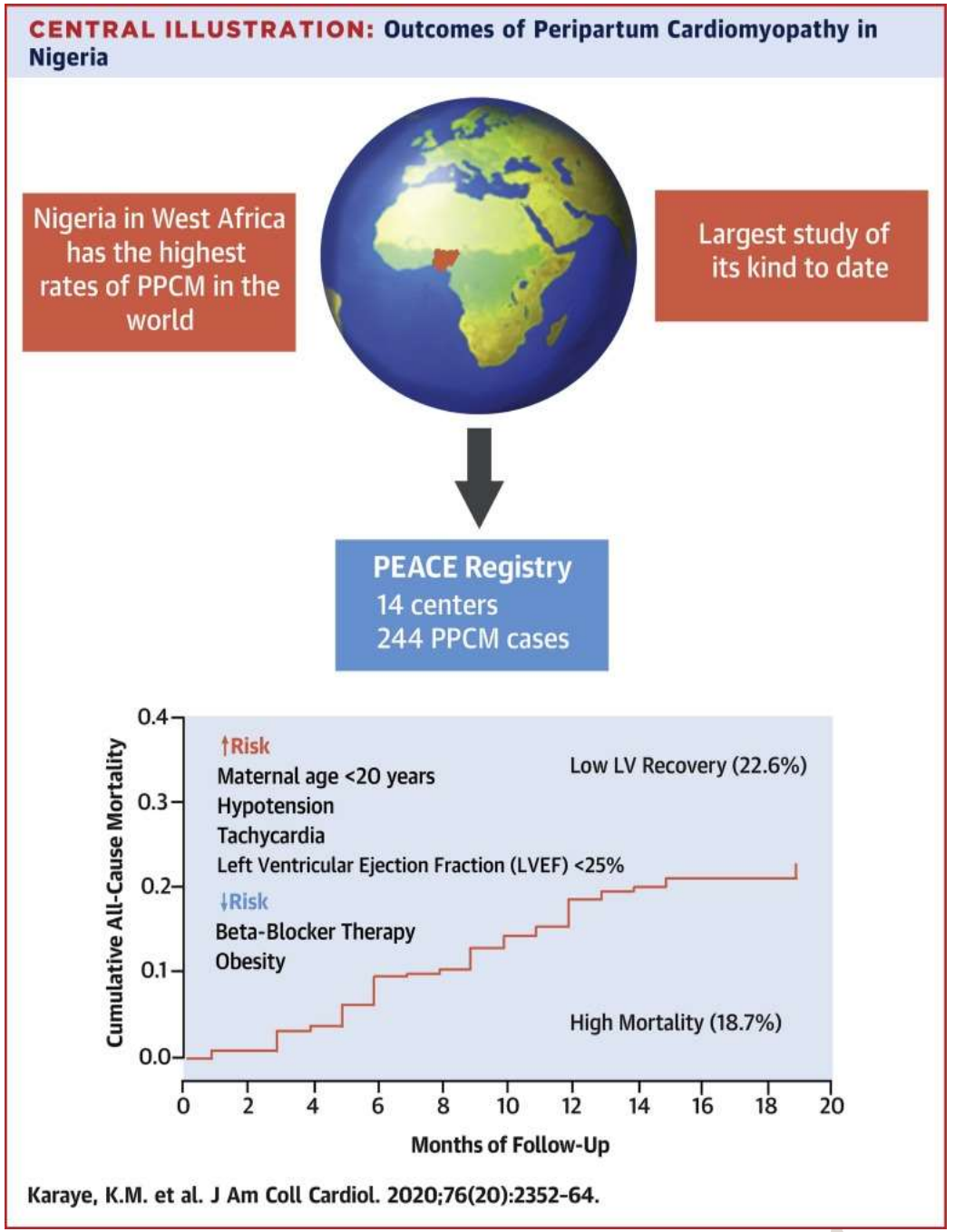
3. No determinable cause

4. Strict echocardiographic indication of left ventricular dysfunction:

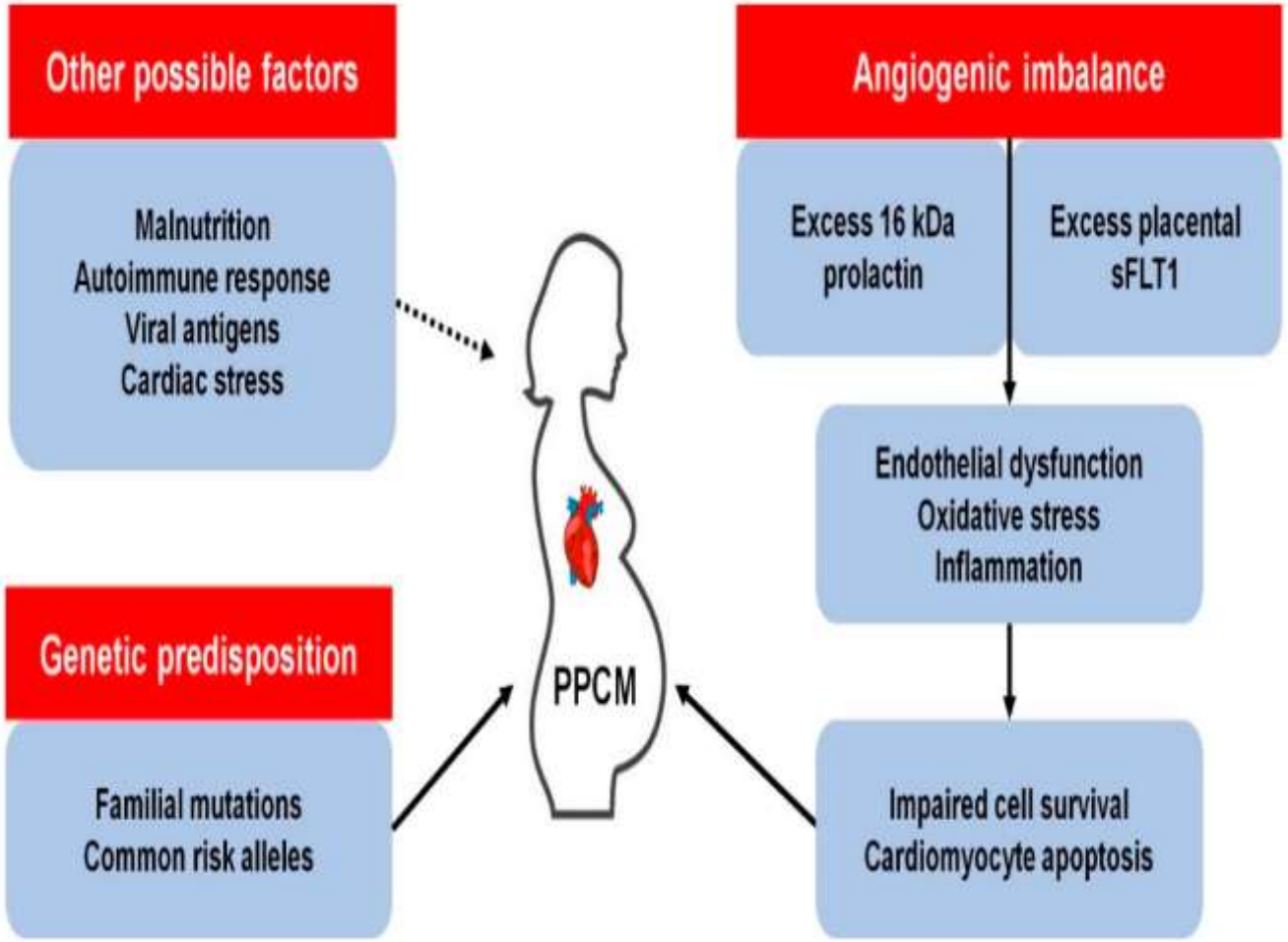
Ejection fraction <45%

# EPIDIEMOLOGY

- United States statistics-Reports estimating the incidence of PPCM ranges from 1 case per 1000-4000 live births.
- The prevalence is reported to be 1 case per 6000 live births in Japan
- 1 case per 1000 live births in South Africa,
- 1 case per 350-400 live births in Haiti.
- 1 case per 100 live births in Nigeria
- A high prevalence in Nigeria has been attributed to the tradition of ingesting kanwa (dried lake salt) while lying on heated mud beds twice a day for 40 days postpartum.
- Approximately 75% of cases are diagnosed within the first postpartum month.
- Approximately 50% of cases occur in women older than 30 years.



# Etiology/ Risk factors




# Symptoms

- Fatigue
- Feeling of heart racing or skipping beats (palpitations)
- Increased nighttime urination (nocturia)
- Shortness of breath with activity and when lying flat
- Swelling of the ankles
- Cough
- Chest pain or tightness

# Differential diagnosis

**Table 1** Peripartal acute dyspnoea: differential diagnosis of acute peripartum cardiomyopathy

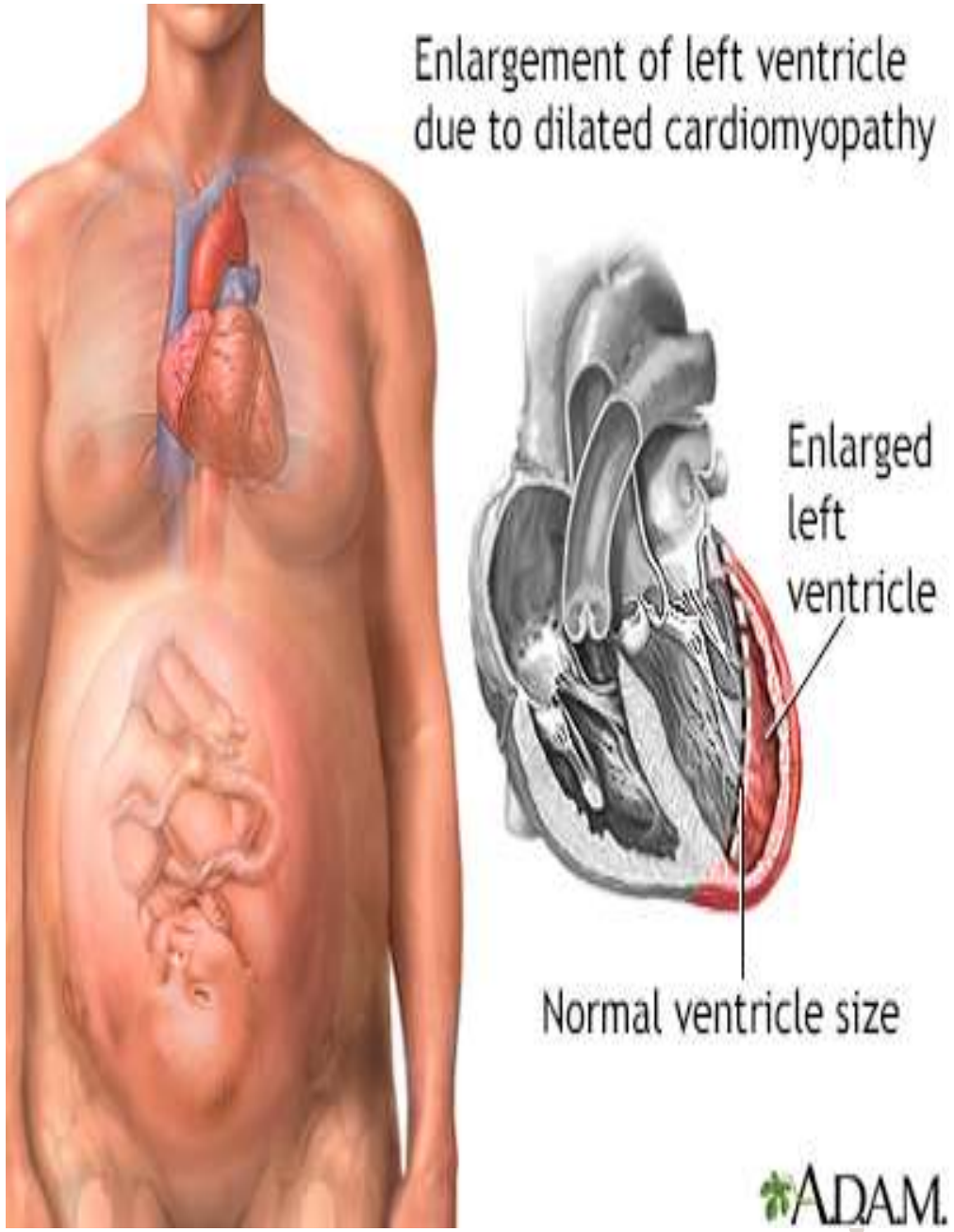
| | PPCM | Pre-existing CMP, valve disease or congenital heart disease | Pregnancy-associated myocardial infarction | Pulmonary embolism/ amniotic liquid embolism | Myocarditis |
|---|---|---|---|---|---|
| History | Most commonly post-partal onset of dyspnoea | Earlier onset (during second trimester)<br>Sometimes family history | Retrosternal chest pain, abdominal discomfort, nausea | Pleuritic chest pain | Infection |
| Biomarkers | Elevated natriuretic peptides | Elevated natriuretic peptides | Elevated troponin | Elevated D-dimer, troponin, natriuretic peptides | Elevated troponin<br>Possibly. elevated natriuretic peptides |
| Echocardiography | Left and/or right ventricular dysfunction | Evidence of pre-existing valve disease or congenital defect | Regional hypokinesis/akinesis | RV dysfunction, elevated RV pressure, McConnell's sign | Regional or general hypokinesis |
| Additional tests | Consider MRI | Consider MRI<br>Consider genetic test | Coronary angiography | CT-scan or. V/Q scintigraphy; consider angiography | MRI<br>Consider myocardial biopsy |

CMP, cardiomyopathy; MRI, magnetic resonance imaging; PPCM, peripartum cardiomyopathy; RV, right ventricular.

* ANEMIA
* THYROID DISEASE
*
PREEXISTING CARDIOMYOPATHY OR CHD
* ACCELERATED HTN
* MYOCARDIAL INFARCTION
* ACUTE PULMONARY EMBOLISM
* SEVERE PREECLAMPSIA
MYOCARDITIS
* PREVIOUS VALVULAR DISEASES

# Diagnosis

- Complete blood cell count with differential
- Electrolyte levels, including magnesium and calcium, creatinine and Urea
- Levels of cardiac enzymes, including troponin
- Level of B-type natriuretic peptide and/or N-terminal pro-B-type natriuretic protein
- Liver function test
- Level of thyroid-stimulating hormone (TSH)
- Chest radiograph
- Electrocardiogram
- Transthoracic echocardiogram
- Cardiac magnetic resonance imaging and/or endomyocardial biopsy (when/if indicated)



# Chest X-ray and ECG findings.

**Findings on chest Xray**

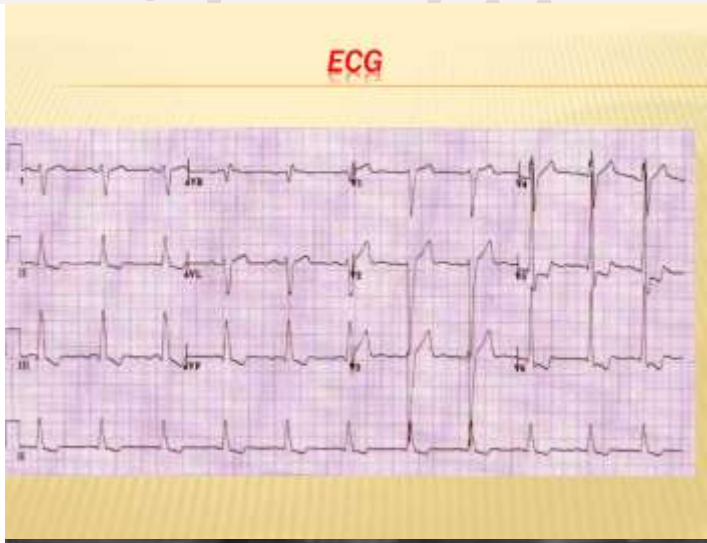
- Enlarged Cardiac shadow or silhouette , Hyperemic lung field ( due to pul. congestion), Bilateral plural effusion

**Findings on ECG**

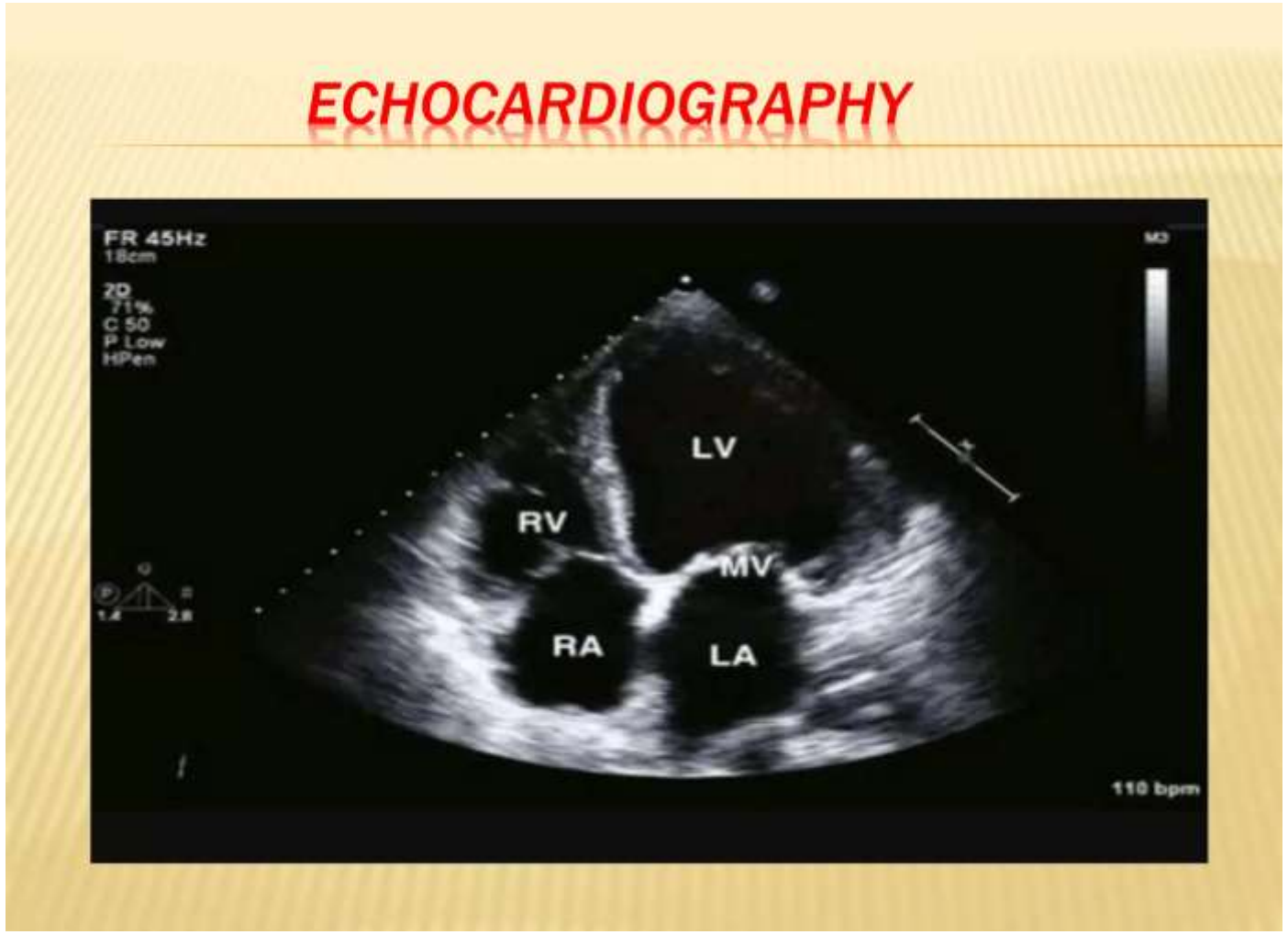
Most commonly -Sinus tachycardia and Arrythmia (e.g atrial fibrillation)

Others -

- LVH with strain pattern
- Low voltage QRS complex with inverted T wave
- Nonspecific ST-T wave changes




# ECHO Findings




Echocardiography findings:

(a and b or c, or all a-c)

a. LVEDD > 2.7 cm/m3

b. M-mode fractional shortening <30%

c. LVEF < 45%

LVEF: Left Ventricular Ejection Fraction:

LVEDD: Left Ventricular End Diastolic Dimension

# MANAGEMENT.

-Multidisciplinary Approach

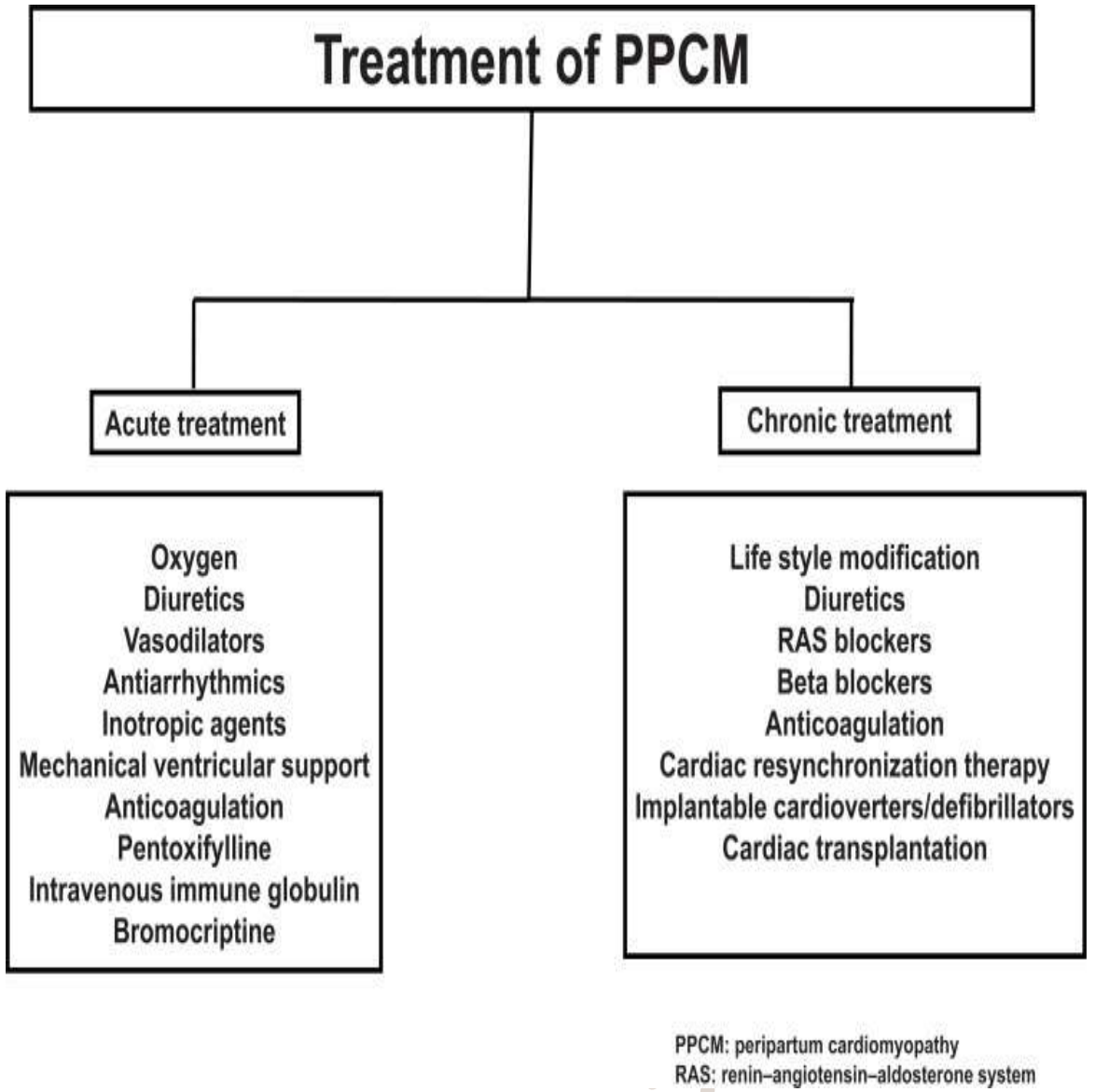
The goal of management is to improve the cardiac output.

Management majorly consists of

- Preload reduction -(diuretics- loop diuretics , sodium restriction, fluid restriction)
- Afterload reduction (BBs, ACEIs, ARBs, Mineralocorticoid receptor antagonist)

Note- ACEIs and ARBs are contraindicated peripartum, ACEI can be used during lactation

- Anticoagulation (LMWH, Unfactionated heparin)



# MANAGEMENT CONTD

## Management during Pregnancy

- Regular checkup, blood tests and ECHO
- Avoid ARB/ACE-I
- Avoid Warfarin and DOAC
- Planning for delivery mode and timing with Cardiology and Obstetrician

## Management during Delivery

- Stable patients typically deliver vaginally
- Prompt delivery in patients with severe HF.
- A multi-disciplinary team is critical!
- If hemodynamically unstable , then ICU care and possible cesarean section.

## Management Post partum

- Cardiology checkup with continuation of medications and regular ECHO
- Breast-feeding- Some studies show no ↓ LV function. Avoid ARBs
- ICD-implantable cardioverter-defibrillator- Possible role for wearable defibrillator as a "bridge to recovery"
- Contraception counseling -Avoid estrogen products early post-partum


# ANTICOAGULANTS

PPCM is associated with higher rates of thromboembolism as the Peripartum period is hypercoagulable state.

Indications for Anticoagulant use

- PPCM patients with LVEF less than 35%
- Use of bromocriptine ( associated with thromboembolism)
- Given as prophylaxis up to 8 weeks post-partum

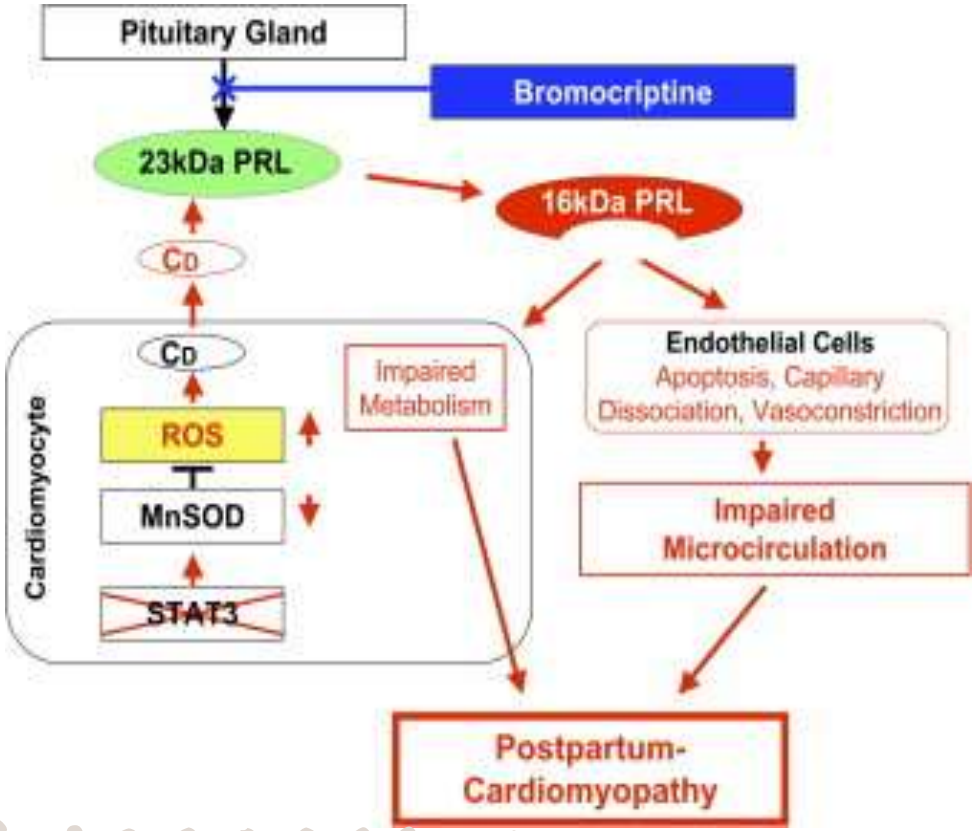
Drugs

LMWH and unfractionated heparin used antepartum

Warfarin used post-partum, Rivaroxaban (xarelto) also used

# BROMOCRIPTINE AND PPCM

- Lower STAT3 expression  and higher serum levels of 16 kDA prolactin are found in women with PPCM compared to controls.
- Administration of bromocriptine to block prolactin reversed PPCM in STAT3 deficient mice.
- Higher rate of LVEF recovery with both long (8 week) and short term bromocriptine could be an addition to heart failure therapy
- Side effects of bromocriptine include inhibition of lactation and thromboembolism.



# Prognosis

Good prognosis from other forms of dilated cardiomyopathy

- 50% patients - complete recovery
- 25% patients - persistent symptoms
- 25% patients – develop complication (progressive heart failure, arrythmia, thromboembolism)

Mortality rate - 3% to 9.6%

Pt with persistent cardiomegaly after six month -mortality rate 85% in 5 yrs.

# Thank you