

# Peripartum Cardiomyopathy

## Introduction

- Rare cause of cardiomyopathy
- Impact on maternal and baby wellbeing.
- Need multidisciplinary team approach from cardiologist, obstetrician, neonatologist, anesthesiologist.

## Definition and diagnosis

• PPCM is an idiopathic CM presenting with HF secondary to LV systolic dysfunction (LVEF <45%) towards the end of pregnancy or in the months following delivery, where no other cause of HF is found (Eur J Heart Fail 2010;12:767).

- Diagnosis of exclusion by ruling out other causes of HF.
- The traditional diagnosis criteria include only the last month of pregnancy to within 5 months after delivery. Total of 23 from 123 patients who presented outside of traditional time-line has similar clinical presentation and outcome (Circ 2005;111:2050).
- Currently there is no diagnostic test but several biomarkers are under investigated e.g. 16-KDa Prolactin, miRNA 146a (see pathogenesis)

## Signs and symptoms

- Typical symptoms of HF e.g. dyspnea, fatigue, edema
- Mimic normal physiological change during pregnancy
- Hard to recognize by patient, nurse and doctor
- Highly variable presentation and prognosis. From simple mild congestion to life threatening shock.

## Differential diagnosis

- Pre-existing/ undiagnosed cardiomyopathy
- Pre-existing/ undiagnosed Valvular heart disease
- Pre-existing/ undiagnosed ACHD
- Pregnancy asso. coronary disease e.g. dissection
- Pregnancy asso. hypertensive heart e.g. preeclampsia
- Others acute disease e.g. PE, myocarditis

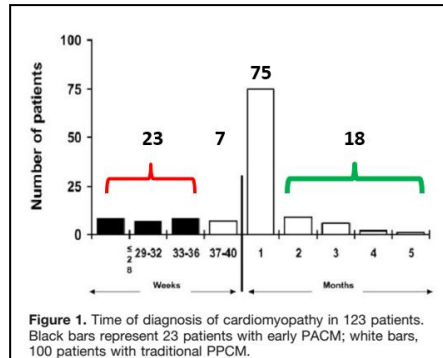
Usually present in early 2nd trimester

## Epidemiology

- 1:300 in Haiti, 1:1000 in South Africa, 1:4000 in USA.
- Unknown incidence in Thailand
- Risk factor: Older maternal age, multiparity, multifetal preg, African descent, high BP, toxin exposure e.g. cocaine. (circ. 2013;127:e622).

## Pathogenesis

- Not fully understood
- More evidences in animal model and patient with PPCM pointing to angiogenesis and role of prolactin
  - key word for further reading: 16Kd-Prolactine, STAT3, MnSOD, Cathepsin D, sFlt, and VEGF.
- Possible other hypothesis: viral infection, auto-immune, genetic, inflammation, apoptosis, hemodynamic factors.



## Management

- Typical HF care. If still pregnant, no ACEI/ARB, MRA.
- Bromocriptine: 2.5 mg BID for 2 weeks, then 2.5 mg OD for 6 weeks (off label)
- Anticoagulation. PPCM has higher risk of thromboembolic events than typical HF
- ICD/CRT after 3-6 months if not recovery.
- Wearable cardioverter-defibrillator (WCD - LifeVest®) may be considered if recovery is expected.
- For delivery, consider c/s with spinal anesthesia
- No breast feeding
- If severe case: CCU, PA cath, hemodynamic optimization, levosimendan (or dobutamine), cesarean section with spinal block, MCS (IABP, VAD, ECMO - bridge to decision (recovery vs BTT), HTx. (Eur J Heart Fail 2016;18:1096)

### Bromocriptine in PPCM

(Circ 2010;121:1465)

- Prospective, single-center, open-label, pilot RCT.
  - n= 20 pts with PPCM
  - mean age = 26 yo, LVEF 27%
  - Bromocriptine vs standard care
- 6 months outcome
- bromocriptine vs std care
  - LVEF: 58% vs. 36 %
  - Death: 1 vs. 4 pts
  - NYHA I: 9 vs. 0 pts

## Prognosis and Outcome

- 10-15% death, 5% MCS/HTx, 40% fully recovery, 40% partially recovery.
- Patients who has fully recovery EF, have very good long term prognosis (NEJM 2000;342: 1077).
- Consider tapering off HF med after 12 months.
- If LVEF was not fully recover, a pregnancy is contraindicated.

HF treatment	Preg	Breastfeed	Note
BB	C	Safe	Fetal bradycardia and hypoglycemia. Theoretically have an anti-tocolytic effect. Prefer metoprolol. Atenolol is class D
ACEI / ARB / ARNI	D	No data	Teratogenic effects i.e. renal dysplasia, lung hypoplasia.
MRA	D	Spiro lactone	Anti-androgenic effects in first trimester
Hydralazine	B	Safe	Fetal tachyarrhythmias
Nitrate	D	No data	Fetal bradycardia
Furosemide	C	Safe	Impair placenta flow. oligohydramnios, decreased breast milk production
HCTZ	B	Safe	
Digoxin	C	Safe	
Warfarin	D	Safe	Teratogenic effects especially first trimester exposure
CXR	Safe	Safe	Fetal shielding.
Echocardiogram	Safe	Safe	
Cardiac MRI	Safe	Safe	Probably safe after first trimester, avoid Gadolinium
Cardiac cath	Safe	Safe	Fetal shielding. Radial approach preferred

## Recommended reading

- Pathophysiology and epidemiology of PPCM. Nat Rev Cardiol 2014;11:364-370.
- Peripartum Cardiomyopathy. Circ 2016;133:1397-1409.
- ESC position statement on peripartum cardiomyopathy. Eur J Heart Fail 2010;12:767-78.