International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2024: 7.101

Challenging Feto- Maternal Rescue with Cross Speciality Collaboration in a case of Active Tuberculosis with Pericardial Effusion & Cardiac Tamponade followed by Dilated Cardiomyopathy

Dr. Nandini Chakrabarti Bhattacharyya[1], Dr. Ritwik Ghosh Haldar[2], Dr. Pratyusha Sinha[3]

[1]MBBS, DGO, DNB, MNAMS, FICOG, Dip in Gynae Endoscopy (Germany)
Consultant, Department of Obstetrics & Gynaecology, Manipal Hospitals, Salt Lake, Kolkata, India

[2]MBBS, DNB, FMAS, MNAMS, Jr. Consultant, Department of Obstetrics & Gynaecology, Manipal Hospitals, Salt Lake, Kolkata, India

[3]MBBS, DA, FPM, Consultant, Department of Anaesthesiology, Manipal Hospitals, Salt Lake, Kolkata, India

Abstract: ***Effusive cardiac tamponade in late pregnancy from tuberculosis (TB) is a rare, life-threatening emergency requiring immediate intervention like pericardiocentesis (fluid drainage)[1] and antitubercular therapy (ATT) to ensure maternal and foetal survival. Symptoms can be non-specific in pregnancy, making diagnosis challenging. A multidisciplinary team approach is crucial for prompt recognition, management, and follow-up care[2]. The case discussion presented here is unique Maternal Near Miss case as both mother & baby were salvaged due to high index of clinical suspicion & multidisciplinary aggressive co-ordinated approach at 35 weeks of gestation with Dilated Cardiomyopathy, Pericardial Effusion & Active Tuberculosis. A G4A0L3, from a humble social background with previous 3 vaginal deliveries, presented at ER of our Multi-speciality Hospital with severe shortness of breath with records of irregular antenatal proceedings in multiple Public & Private Health Facilities. Meticulous medical history revealed past history of Pulmonary Koch's & history of Pericardiocentesis & ATD for Tubercular Pericardial effusion in current pregnancy. Prompt collaboration with Cardiologist revealed DCM with LVEF of 30% on Echocardiography. Consensus of prompt delivery was made on war footing with intensive co-ordination with Administrative Authority & Medical Team comprising of Obstetrician, Anaesthesiologist, Cardiologist, Pulmonologist, Critical Care Specialists, Neonatologist & Emergency Laboratory Service with rigorous counselling & High-Risk Consent.***

Keywords: Tubercular Pericardial Effusion, Maternal Near Miss, Multi-disciplinary Care, High Risk Obstetrics, Cardiac Tamponade in Pregnancy

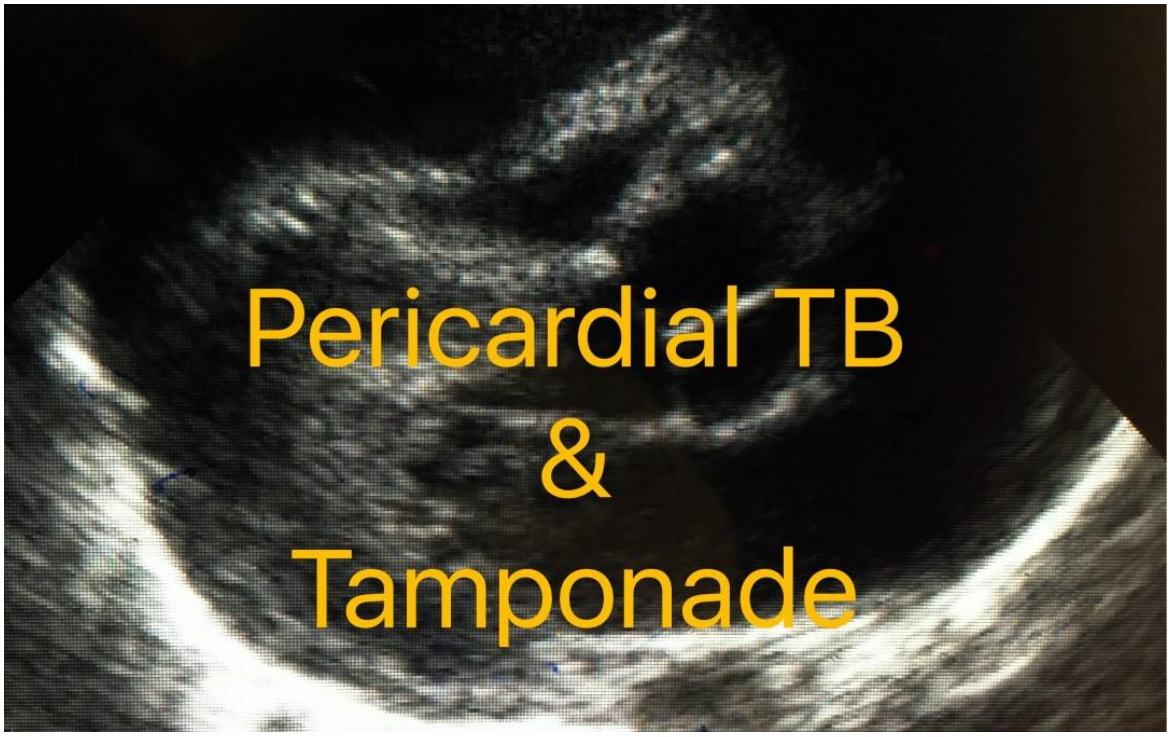
1. Introduction

In this unique case there are dual challenges of peripartum management of Cardiac compromise due to Pericardial effusion with DCM & Extrapulmonary TB. Pregnancy, itself is characterised by altered hemodynamic status to allow the physiological demands to the foetus while maintaining the maternal cardiovascular integrity. Thus, cardiac compromise can result in sub-optimal foeto-maternal outcome. Total blood volume increases by 45% & Cardiac Output increases by upto 50% which increases cardiac end-systolic & diastolic dimensions. Stroke Volume (SV x Heart Rate (HR)[3] = Cardiac output (CO). Cardiac output increases by 30-50% in 1st & 2nd trimesters, Systemic Vascular Resistance (SVR) drops by 40% by mid-trimester. All these are reflected in clinically as shortness of breath or dyspnoea due to hyperventilation, visible jugular venous pressure, drop in BP, increase in Left ventricular dimension due to increase in pre-load & contractility with occasional innocuous mild pericardial collection of not much clinical significance in otherwise healthy pregnancy. These can cause diagnostic dilemma & prevent prompt medical attention. But strict & smart clinical vigilance can salvage life even in an unbooked case first observed at ER of a Multi-speciality Hospital.

2. Case Report

A 32year-old, G4P3L3A0, at 35 weeks+ of gestation having previous 3 Vaginal Deliveries with last childbirth 3 years ago, presented to ER of the Hospital with sudden onset of SOB (shortness of breath) since morning. She was under regular follow up at a public sector. At ER, she assumed a leaning posture. Examination revealed tachycardia of 125bpm, tachypnoea with SpO2-96% with BP: 80/50 mm of Hg in room air in propped up position & GCS within normal limits. FHS was localized.

Pt had a history of Pericardial Effusion & Cardiac tamponade at 31 weeks. Pericardiocentesis through emergent pericardial window was suggestive of Extrapulmonary TB and she was put on ATDs viz Rifampicin & Isoniazid.



Pt had a History of Pulmonary TB in 2019, She was on ATD and DOTS was completed.

Echocardiography done at emergency basis revealed: global hypokinesia with Ejection fraction 30% with tachycardia of 150 bpm

USG revealed FGR < 5th centile with brain sparing effect in MCA, Uterine Doppler PI was abnormal. Patient's husband & relatives were counselled regarding critical condition & guarded prognosis of mother & fetus.

After being transferred to ICU (Intensive Care Unit), and decision of Emergency Cesarean Section was taken to avoid overload to a already failing heart.

Management continued with IV Fluids, Furosemide.

DCM WAS SUSPECTED.

Consensus of delivery of the fetus was made for betterment of maternal prognosis by the team. High Risk Informed Consent was obtained from patient's husband & mother by collaborative team of Obstetrician, Anesthesiologist, Cardiologist & Neonatologist.

Patient with all ALS, was shifted to OT through sterile corridor. Emergency LSCS was done promptly through Pfannenstiel Incision under General Anesthesia. Thick meconium stained liquor was found establishing Fetal Distress. A 2100g baby was delivered and handed over to the Neonatal Team. Patient was shifted to ICU. Next day, she was extubated successfully. Oral Fluids were restricted to 1litre /day. Salt restricted diet was prescribed & mother was shifted to ward on 3rd day.

Baby did not cry at birth. Baby too was ventilated with FiO2 50%. Bag-Mask ventilation (BMV) along with chest compression was continued .HR was below 60. HR improved to 130/min. Colour changed to pink after i*ntubation.* Baby was shifted to NICU & due to persistent tachypnoea & ongoing respiratory distress with grunting & retractions. Chest X-ray was suggestive of RDS.

Baby was gradually weaned off from Ventilator on day 2. Vitals stabilized & Oro-gastric feeds were gradually stepped up.

Mother & Baby was discharged on 7th Post Operative Day.

3. Discussion

Pericardial effusion is the most common manifestation of pericardial diseases during pregnancy[4]. This effusion is benign, mild or moderate, well tolerated, with spontaneous resolution after delivery; no specific treatment is required. Acute pericarditis is the second most common condition, usually requiring medical therapy during pregnancy. Cardiac tamponade and constrictive pericarditis are rare in pregnancy. Pre-pregnancy counselling is essential in women of childbearing age with recurrent pericarditis[5] to plan pregnancy in a phase of disease quiescence and to review therapy. High-dose aspirin or nonselective nonsteroidal anti-inflammatory drugs, such as ibuprofen and indomethacin, can be used up to the 20th week of gestation. Low-dose prednisone (2.5-10 mg/d) can be administered throughout pregnancy. All of these medications, apart from high-dose aspirin, may be used during lactation[6]. Colchicine is compatible with pregnancy and breastfeeding, and it can be continued throughout pregnancy to prevent recurrences.

Dilated cardiomyopathy (DCM) is characterized by an enlarged left ventricle and systolic dysfunction[7]. Pregnant patients with DCM are rare as a result of the disease severity in the young. Plasma volume and cardiac output increase by 40–50% and 30 50%, respectively during pregnancy [8] and the ability to adjust to these dynamic changes is of great

clinical importance, especially in pregnant women with decreased cardiac function. The World Health Organization classification of maternal cardiovascular risk uses a LV Ejection Fraction cut-off of 30%[9]. **Severe left ventricular compromise (ejection fraction <30%)** places a woman in modified WHO Class IV, the highest-risk category. Our patient had LVEF of 30% after admission through ER. Pregnancy is generally considered contraindicated in these cases due to the extremely high risk of maternal death or severe complications. Appropriate follow-up with a multidisciplinary team with experience in the field is recommended throughout pregnancy to ensure good maternal and foetal outcomes. Aetiology of DCM is still unknown, but proposed causes include viral myocarditis, abnormal immune response to pregnancy, aberrant response to greater hemodynamic burden of pregnancy, hormonal interaction, malnutrition, inflammation & apoptosis. Current Theory regarding pathophysiology is "Two hit Hypothesis" (Cruz,2018;Ricke-Hoch,2020)[10]. It can affect genetically susceptible women with one of several cardiac gene mutations including *TTNC1, TTN & STAT3*.Pregnancy at term is further characterised by prodigious secretion of Prolactin & antiangiogenic molecule *soluble fms like tyrosine kinase (sFlt-1)*[1].It has been hypothesized that 16-kDa, Prolactin fragment -*vasoinhibin*-acts along with *(sFlt-1)* cause myocardial damage with ventricular dysfunction. Bromocriptine therapy is evaluated in one pilot study with higher rate of Left ventricular Recovery. Reasonably breast feeding is also proscribed.

Pericardial effusion leading to cardiac tamponade is a relatively rare entity in pregnancy[12]. ***Cardiac tamponade*** is an uncommon but life-threatening emergency that may occur in pregnant women. There is a plethora of causes, but prompt diagnosis and intervention is imperative to optimize both maternal and foetal outcomes Patients often present acutely with chest pain, dyspnoea, and tachypnoea with cardiovascular collapse, but the disease course may be subacute or chronic with an initial asymptomatic period followed by progression [13]. It can be difficult to discern whether common findings in pregnancy like peripheral oedema, dyspnoea, and hyperventilation are physiologic or pathologic in aetiology.

Tuberculosis remains an important cause of mortality and morbidity with TB[14] in pregnancy affecting the pregnant women both physically and mentally. TB in pregnancy is associated with significant obstetric morbidity. TB in pregnancy is associated with increased chances of abortions, preterm labour, foetal prematurity, low birth weight babies, preeclampsia and PPH[15]. Early initiation of ATT will reduce the obstetric morbidity. Pregnant women with pulmonary TB should be managed by multidisciplinary team comprising obstetrician, chest physician, infectious disease specialist, bacteriologist and neonatologist.

4. Conclusion

Pericardial involvement is sporadic during pregnancy, and pregnant women present no predisposition to pericardial diseases. Childbearing-age women with underlying pericardial diseases, such as recurrent pericarditis, should have proper control of their disease before conception, and their medical therapy should be optimised. For this reason, pre-pregnancy planning is crucial. Diagnosis of pericardial diseases during pregnancy should minimise investigations that may be harmful to the foetus. Likewise Diagnosis of TB in pregnancy is more challenging due to masking of symptoms due to physiological response in pregnancy. Management of TB cases in pregnancy are in the context of Revised National Tuberculosis Programme (RNTCP)[16] and the adoption of Directly Observed Treatment Short course (DOTS)[17]. Besides prompt peripartum management with interdisciplinary collaboration, intervention of administrative authority & empathic counselling with medicolegally approved high- risk consent played a game changer in the logistic support & seamless navigation during Hospital stay from ER, OT, ICU, HDU & finally to ward. Mother & Baby were discharged in stable condition with follow up schedule.

References

[1] Pritchard JA. Changes in the blood volume during pregnancy and delivery. Anaesthesiology 1965; 26: 393–9.
[2] JCS 2018. Guideline on indication and management of pregnancy and delivery in women with heart disease. Available at: http://www.j-circ.or.jp/guideline/pdf/JCS2018_akagi_ikeda.pdf; 2019 [accessed 20.05.02].
[3] Thorne S, MacGregor A, Nelson-Piercy C. Risks of contraception and pregnancy in heart disease. Heart 2006; 92: 1520–5.
[4] Regitz-Zagrosek V, Roos-Hesselink JW, Bauersachs J, Blomström-Lundqvist C, Cífková R, De Bonis M, et al. ESC guidelines for the management of cardiovas cular diseases during pregnancy. Eur Heart J 2018; 39: 3165–241.
[5] Grewal J, Siu SC, Ross HJ, Mason J, Balint OH, Sermer M, et al. Pregnancy outcomes in women with dilated cardiomyopathy. J Am Coll Cardiol 2009; 55: 45–52.
[6] Katsuragi S, Omoto A, Kamiya C, Ueda K, Sasaki Y, Yamanaka K, et al. Risk factors for maternal outcome in pregnancy complicated with dilated cardio myopathy. J Perinatal 2012; 32: 170–5.
[7] Boyle S, Nicolae M, Kostner K, Davies K, Cukovski I, Cunliffe A, et al. Dilated cardiomyopathy in pregnancy: outcomes from an Australian tertiary centre for maternal medicine and review of the current literature. Heart Lung Circ 2019; 28: 591–7.
[8] JCS 2018. Guideline on Diagnosis and Treatment of Cardiomyopathies. Available at: http://www.j-circ.or.jp/guideline/pdf/JCS2018_tsutsui_kitaoka.pdf; 2019 [accessed 2020.05.02].
[9] WHO Global Tuberculosis Report 2017. Geneva: World Health Organization Online: http://apps.who.int/medicinedocs/documents/s23360en/s23360en.pdf lastaccess: 20.12.2018.
[10] Sugarman J, Colvin C, Moran A C. Tuberculosis in pregnancy: an estimate of the global burden of disease. *Lancet Glob Health* 2014; 2: e710–e716.
[11] Yadav V, Sharma JB. Obstetrical and perinatal outcome in pregnant women with extrapulmonary tuberculosis. *Indian J Tuberc* 2019; 66(1):158-162.

[12] Bates M, O'Grady J, Mwaba P, Chilukutub L, Mzyece J, Cheelo B, et al. Evaluation of the burden of unsuspected pulmonary tuberculosis and co-morbidity with noncommunicable diseases in sputum producing adult inpatients. *PLoS One* 2012; 7(7).
[13] Mathad JS, Gupta A. Tuberculosis in pregnant and postpartum women: epide-miology, management, and research gaps. *Clin Infect Dis* 2012; 55:1532–49.
[14] Mahendru A, Gajjar K, Eddy J. Diagnosis and management of tuberculosis in pregnancy. *Obstet Gynaecol* 2010; 12:163e171.
[15] Jana N, Vasishta K, Jindal SK, Khunnu B, Ghosh K. Perinatal outcome in pregnancies complicated by pulmonary tuberculosis. *Int J Gynaecol Obstet* 1994; 44:119–24.
[16] Kourtis AP, Read JS, Jamieson DJ. Pregnancy and infection. *N Engl J Med* 2014; 370:2211–8.
[17] Flibotie JJ, Lee GE, Buser GL, et al. Infertility, in vitro fertilization and congenital tuberculosis. *J Perinatol* 2013; 33:565–8.