

Management of pregnant woman with symptomatic severe rheumatic mitral stenosis and severe pulmonary hypertension: a case report

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Case Report

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Abstract

Rheumatic heart disease (RHD) is a chronic cardiovascular disease that can cause valvular heart disease and is the most common cardiovascular disease in low-income countries. In developing countries, RHD including mitral valve stenosis (MS) is the most important cause of maternal mortality and morbidity. A 34-year-old woman known case of rheumatic MS presented at 14 weeks of pregnancy with exacerbated dyspnea (NYHA class III). first diagnosed with rheumatic MS during her third pregnancy. She had not received regular follow-up or adhered to secondary prophylaxis before these pregnancies The first echocardiography during this pregnancy shows Severe MS and Severe PH. Given the patient's gestational age, worsening dyspnea, and WHO classification class IV, termination of pregnancy was discussed but refused. The patient was informed about the risks associated with continuing the pregnancy also percutaneous transluminal mitral commissurotomy (PTMC) was recommended at 18 weeks also refused. The pregnancy continued and patient underwent regular visits, close follow-up and up titration of medical treatment. At 36 weeks and four days, elective CS was performed with general anesthesia under close monitoring in a tertiary center. Throughout the pregnancy, delivery and early postpartum period, the patient did not experience complications also neonate was born without any complications. there is paucity of information on the medical management of severe MS in pregnant woman also optimal medical treatment is very effective in these patients. This case report shows the experience of successfully medical management in a pregnant woman with severe MS and severe PH and the good prognosis by adhering to the guidelines in patients who refuse termination of pregnancy and PTMC.

Introduction

Rheumatic heart disease is a sequela of acute rheumatic fever, that occurs after group A streptococcal pharyngitis and causes over two hundred thousand deaths per year (1). In developing countries, rheumatic valve disease including mitral valve stenosis is the most important cause of maternal mortality and morbidity such as pulmonary edema, arrhythmias, heart failure and fetal complication such as preterm delivery, intrauterine growth restriction and death (2, 3). Regarding to the WHO guidelines in patients with severe mitral stenosis (MS), pregnancy is contraindicated, and termination should be recommended (4). We present our management and experience of a woman who is 14weeks pregnant with symptomatic severe mitral stenosis (MS) and Severe pulmonary hypertension (PH) who refused termination of pregnancy and percutaneous transvenous mitral commissurotomy (PTMC).

Case presentation

A 34-year-old woman with a low socioeconomic status and a known case of rheumatic mitral stenosis was visited after exacerbation of dyspnea (NYHA class III) at 14 weeks of pregnancy (G4 P2 L2A1: Gravida 4, Para 2, live 2 Abortion 1). For the first time during her third pregnancy and approximately six years ago, she was diagnosed with rheumatic MS. Due to their low socioeconomic status, she did not follow-up care received between the third and fourth pregnancies and was not adherent to standard

secondary prophylaxis regimen. In her medical history, she reported Dyspnea (NYHA Class II) before pregnancy which is worsened to NYHA class III in the 14th week of pregnancy. Physical examination revealed diastolic murmur and opening snap. at 14 weeks of pregnancy TTE showed: mild left ventricular systolic dysfunction (LVEF:45–50%), rheumatic severe MS (MVA by direct planimetry:0.74cm², MPG:18mmHg), Severe pulmonary hypertension (SPAP:90mmHg). ECG demonstrated Normal sinus Rhythm, Normal axis deviation, left atrium abnormality, Nonspecific ST-T changes. Regarding to the patient's gestational age, dyspnea (NYHA class III), WHO classification class IV and completion of child bearing, legal Abortion was discussed to the patient and her family but refused. Then, emphasizing the risk of continued pregnancy for mother and the fetus, as well as Forensic medical advice, the pregnancy continued based on the decision of the mother and her family. so the patient underwent regular visits and close follow-up and up titration of Medical treatment based on history and physical examination and echocardiographic findings ,initial Metoprolol succinate 47.5 1/2 daily and furosemide 40 mg 1/2 daily and Monthly follow-up visits were conducted during the second trimester. Despite the improvement of the patient's dyspnea to NYHA class 2 due to the SPAP above 50 mmHg, according to the guidelines PTMC was recommended at 18 weeks, which was refused by the patient. Also, the patient was visited every two weeks in the third trimester and Metoprolol succinate up titrated to 47.5 once daily and furosemide 40 mg 1/2BD.

The pregnancy continued until 36 weeks and 4 days. At 36 weeks and four days, elective CS was performed with general anesthesia under close monitoring in a tertiary center. After delivery, she was transferred to CCU for close monitoring for 48 hours. During pregnancy, delivery and early post-partum period, with medical treatment and regular visits and physical examination, no complications including pulmonary edema, thromboembolic events, arrhythmia, heart failure, and the need for invasive interventions occurred and a neonate was born with the following conditions (weight:2200gr height:43cm Apgar score:9 HR:140 RR:40 BP:70/40) and monitoring for 72 hours at NICU. No complications occurred for neonates including bradycardia, hypoglycemia, hypotension, hypoxia, etc.

Discussion

Rheumatic fever is endemic in lower- and middle-income countries (LMIC) (1). The prevalence of rheumatic MS in pregnancy in developing countries is about 40–50% of cardiac diseases in pregnancy (5). According to who guidelines, our patient is classified as class four and fall into the very high-risk category indicating contraindication. In this situation, terminate of the pregnancy should be advised (4). There is paucity of information on the management of severe MS in pregnant woman (3). And also, optimal medical treatment is very effective in these patients. The drug of choice for pregnant women with severe MS is betablockers for Rate control (aiming for about 70-80bpm) and loop diuretics for managing congestion. Anticoagulant indications are similar to the general population. PTMC is recommended during pregnancy between 18 and 24 weeks, however it can be performed in high maternal risk conditions at any time during pregnancy (6). This case highlights several important points. Avoidance of pregnancy in severe mitral stenosis and severe pulmonary hypertension may not always be feasible, especially in low socioeconomic communities. Furthermore, some patients may refuse

PTMC.so it is essential to be knowledgeable about the management of these patients. In this case, we successfully managed an uncomplicated pregnancy by up titration of the drug dosage based on heart rate, blood pressure, congestion, echocardiographic finding and frequent patients visits. Therefore, it can be said that by adhering to the guidelines, it is possible to use medical management instead of termination of pregnancy in patients with severe mitral stenosis, and severe pulmonary hypertension with further studies in this field and these patients can be reduced from WHO class IV to WHO class III.

Abbreviations

RHD: Rheumatic Heart Disease

MS: Mitral Stenosis

PH: Pulmonary Hypertension

NYHA: New York Heart Association

PTMC: Percutaneous Transvenous (or Transluminal) Mitral Commissurotomy

TTE: Transthoracic Echocardiography

ECG: Electrocardiogram

LVEF: Left Ventricular Ejection Fraction

MPG: Mean Pressure Gradient

SPAP: Systolic Pulmonary Artery Pressure

LMIC: Low- and Middle-Income Countries

CS: Cesarean Section

LA: Left Atrium

LV: Left Ventricle

ST-T: ST segment–T wave changes (ECG)

Declarations

Ethics approval and consent to participate

Not applicable

Consent for publication

The patient has provided informed consent for publication of the case.

Data Availability statement

The data supporting this study will be made available by the authors upon reasonable request

Competing Interests

The authors declare that they have no competing interests.

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Author Contribution

H.H: Conceptualization, Data curation, Project administration, Validation, writing original draft, Methodology M.J: Validation, writing review, and editing. A.Y: Data curation, Writing review and Editing.

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Table

Table1 Time-line:

Prepartum	
Antepartum	• Rheumatic heart disease was diagnosed for the first time during her third pregnancy (six years ago). • No adherence to drug and secondary prophylaxis regime • She mentions dyspnea(NYHA class II) Before the fourth pregnancy • She did not use any contraceptive method • No follow-up during these six years
Second trimester	• First visit in the 14th week of pregnancy due to exacerbation of dyspnea(NYHA Class III) • First Trans thoracic echocardiography(TEE) during pregnancy(14thweek): Normal Left ventricular(LV) size and Mild systolic dysfunction LVEF:45-50 Moderate to severe right ventricular(RV) enlargement and mild to moderate dysfunction, Rheumatic severe MS(MVA by direct planimetry:0.51cm² , MPG:20mmHg ,total wilkins score 9) and Mild MR Rheumatic AV and Mild to moderate AR , NO AS Moderate to severe TR Severe pulmonary hypertension(SPAP:94mmHg) Plethoric IVC • ECG: Normal sinus rhythm and HR:90bpm • Discussed to terminate the pregnancy but was refused by patient • First Medical treatment and follow up according to guideline directed medical treatment(14thweek): initiated Metoprolol succinate 47.5 ½ once daily and furosemide 40 mg ½ daily and follow-up visit every four weeks • second visit in the 18th week of pregnancy and dyspnea (NYHA class II) • TTE : severe MS(MVA by direct planimetry:0.52cm² , MPG:14mmHg) and SPAP:70mmHg • ECG: Normal sinus Rhythm and HR:80bpm • discussed to PTMC but refused by the patient • Increase the dose of Metoprolol succinate 47.5 once daily and furosemide 40 mg ½ BD
Third trimester	• The patient was visited in the 22nd and 25th weeks of pregnancy • The patient's dyspnea NYHA class II • TTE finding: severe MS(MVA by direct planimetry:0.51cm² , MPG:10mmHg) and SPAP:50mmHg

- ECG: Normal sinus rhythm and HR:70bpm
 - Re-advised to PTMC but refused by the patient
 - Continued Metoprolol succinate to 47.5 once daily and furosemide 40 mg ½ BD
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- **The patient was visited in the 27th to the 36th weeks of pregnancy(every two weeks)**
 - The patient's dyspnea was remained NYHA class II and there were No other complications
 - TTE similar to previous findings
 - ECG: Normal sinus Rhythm
 - Successful delivery by caesarean section with general anesthesia at 36 weeks and 4 days in a tertiary center without any complication

Postpartum

- The patient was transferred to CCU for 48h after delivery
- Two days after delivery, the patient was discharged without any complications
- the patient was revisited One week, two weeks and one month after discharge
- During the postpartum period, the patient's dyspnea was NYHA class II
- In the postpartum period, the patient was treated with metoprolol succinate 47.5mg daily and furosemide 40 ½ Daily
- TTE was similar to previous findings
- ECG: Normal sinus rhythm
- No complications were seen during the follow-up in the postpartum period

Figures



Figure 2

ECG showed: Normal sinus Rhythm, Normal axis deviation, left atrium abnormality, Nonspecific ST-T changes