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**Dr. Ambareen Momin**  
Resident (3rd Year),  
Department of  
Anaesthesiology, Mahatma  
Gandhi Missions Medical  
College and Hospital,  
Kamothe, Navi Mumbai,  
Maharashtra, India

**Dr. Richa Chinchkar**  
Assistant Professor,  
Department of  
Anaesthesiology, Mahatma  
Gandhi Missions Medical  
College and Hospital,  
Kamothe, Navi Mumbai,  
Maharashtra, India

**Dr. Abhijeet Thomas**  
Resident (1st Year),  
Department of  
Anaesthesiology, Mahatma  
Gandhi Missions Medical  
College and Hospital,  
Kamothe, Navi Mumbai,  
Maharashtra, India

**Corresponding Author:**  
**Dr. Ambareen Momin**  
Resident (3rd Year),  
Department of  
Anaesthesiology, Mahatma  
Gandhi Missions Medical  
College and Hospital,  
Kamothe, Navi Mumbai,  
Maharashtra, India

## Anaesthetic management of a case of eclampsia with underlying cardiac disease: Case report

**Dr. Ambareen Momin, Dr. Richa Chinchkar and Dr. Abhijeet Thomas**

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### Abstract

Rheumatic heart disease (RHD) is a disease of lower socioeconomic class and has reemerged as a priority in global health. Disability-adjusted life years because of RHD is >10 million. The World Health Organization set the goal of reducing the global maternal mortality ratio to less than 70 per 100 000 births.

A variety of pregnancy-associated cardiovascular changes often exacerbate the signs and symptoms of valvular lesions. This importance arises from the fact that drugs used for preventing or relieving pain during labor and delivery exert a major influence – for better or for worse – on the prognosis of the mother and newborn. Properly administered anesthesia and analgesia can contribute to the reduction of maternal and neonatal mortality and morbidity. In this case we examine 38yr old female, G3P2L2 with 43 weeks gestation (covid 19 suspect), previous two normal home deliveries presenting with eclampsia. Caesarian section was done under general anesthesia and patient recovered. Patient was subsequently found to have rheumatic heart disease with mitral stenosis.

**Keywords:** Covid 19 suspect, rheumatic heart disease, eclampsia, general anesthesia

### Introduction

Rheumatic heart disease is the number one worldwide cause of maternal cardiac complications in pregnancy. Since symptoms of rheumatic fever mostly do not present till the fourth or fifth decade, the pathophysiologic changes associated with pregnancy cause around 25% of these women to first experience symptoms during pregnancy. Therefore, it is important that obstetric anesthesiologists are aware of the disease, its complications, and management of valvular lesions throughout the birthing process. Recent advances in the management of valvular disease include the use of beta-blockers for patients with mitral stenosis, vasodilators in those with aortic and mitral regurgitation, and percutaneous balloon valvuloplasty for mitral and aortic stenosis. Application of these therapies in the pregnant patient is as still debated, and management decision needs to be customized, weighing the pros and cons to ensure maternal survival and to promote fetal well-being.

During the covid 19 epidemic it is likely that anesthesiologists need to care for the parturient without confirmation of the covid status. Emergency intubation and subsequently mechanical ventilation may be necessary as was in this case, and was performed fortunately under full protection according to the ASA guidelines.

### Case

Mrs. X, 38 year old female, G3P2L2 with previous 2 normal home deliveries, h/o Pregnancy induced hypertension presented to the casualty with seizures. on 1/6/20. On examination, her HR was 100 bpm, pulse regular in beat and volume, heart sounds were normal with no added sounds, BP was 190/100 mmhg, decreased AE B/L with coarse crepitations present, B/L pitting pedal edema.

Patient was shifted to her left lateral side, mouth gag inserted and 2 large bore IV cannulas secured.

Her covid swab was sent along with routine investigations and urine routine and microscopy. ECG showed normal sinus tachycardia and continuous foetal heart rate monitoring was done Pt was given injection labetalol 10mg IV, loading dose of magnesium sulfate 4g IV in 100ml NS slowly over 10mins, 10mg furosemide and bolus of 200ml NS.

After about an hour her BP was 170/98, and another dose on injection labetalol 10mg IV was given. Patient developed headache, blurring of vision and altered sensorium.

Patient developed breathlessness and increased RR to about 25 cpm and hypoxia about 88%. NIV was given starting about 4L O<sub>2</sub>/min increasing to about 10L O<sub>2</sub>/min. Patients GCS dropped to E2VIM2. Emergency intubation was done after premedication with injection midazolam 0.5 mg/kg and injection propofol 2mg/kg. Foetal heart rate showed dips to about 100 bpm. The decision for emergency caesarian section was taken under general anesthesia after taking consent from the relatives. One unit of cross matched blood and platelets was reserved and availability of ICU was confirmed.

Patient's labs showed Hb of 12 g/dl, TLC of 13000, Plt C. 85000, T.bili 0.7, S.creat 0.2, PT 15, INR 1, urine albumin +1.

Patient was transferred to the OT table, painted and draped. Her BP was 150/90, HR 90bpm. Inhalational agent Isoflurane was started along with N<sub>2</sub>O:O<sub>2</sub> was kept at 50:50. Patient was given injection atracurium 0.3 mg/kg and baby was delivered. Inhalational agent was switched of, injection fentanyl 2 mcg/kg was given and N<sub>2</sub>O: O<sub>2</sub> was kept 70:30. Oxytocin 20IU IV was given slowly and 10IU IM was given. After the operation patient was due to be shifted to ICU on AMBU and O<sub>2</sub> at 6L/min.

Patient crashed, PR NR and CPR was started and patient was shifted back to the OT. CPR was continued and injection adrenaline 1amp IV was given. CPR was continued as per ACLS protocol and ROSC was achieved in 5 mins. Patient was transferred to the ICU.

Patient was found to have a middiastolic murmur and short systolic murmur. 2D ECHO showed left atrial and left ventricular enlargement, moderate mitral stenosis and moderate mitral regurgitation. CXR showed straightening of the left border of the heart. IV fluids were withheld and injection furosemide 40 mg 12 hrly, injections metoprolol 12.5 mg OD and injection amlodipine 5 mg OD was started. Patient was gradually weaned off the ventilator.

### Discussion

Young women might have asymptomatic mitral valve disease which becomes apparent during the hemodynamic stress of pregnancy. In developing countries, mitral stenosis is occasionally encountered in pregnant women, where rheumatic fever is endemic. These patients are mostly encountered at an advanced stage of pregnancy, because of resistant heart failure symptoms. The normal physiological changes of pregnancy cause unique problems to the mother with underlying cardiac disease. The increased volume and heart rate of pregnancy are not well tolerated in patients with more than mild stenosis. Maternal complications i.e. atrial fibrillation and congestive heart failure can occur. In general, regurgitant lesions are better tolerated due to the increase in intravascular volume and decrease in the SVR, improving forward flow of the blood through the valves. In contrast, stenotic lesions are poorly tolerated due to the inability to increase the CO through the stenotic valve in the setting of increased intravascular volume and increased preload.

In patients with rheumatic heart disease, mitral stenosis is the most common heart lesion. When these patients become pregnant, the hypervolemia and increased HR can increase the trans mitral pressure gradient, leading to increased left atrial volume and pressure. Pressure can be transmitted to the pulmonary vasculature, resulting in pulmonary edema and in severe pulmonary hypertension, a significant risk

during pregnancy as it can cause right heart failure. Further, the chronically dilated left atrium has a propensity to disrupt the cardiac conducting system and cause supraventricular tachycardia, a detrimental event in patients with mitral stenosis who rely on the atrial kick to augment preload.

As the first and second heart sounds are usually accentuated during normal pregnancy (via hyper dynamic circulation), diastolic murmurs are uncommon and usually indicate abnormal structural heart disease. The systolic murmur of mitral regurgitation gets softer or even disappears during pregnancy. This reflects the decrease in regurgitation volume caused by the reduction of the systemic vascular resistance. The most critical clinical aspect of MS patients is the heart rate. Rapid heart rate shortens diastolic filling time, increases the left atrial pressure and the pulmonary venous pressure and causes heart failure symptoms.

Overall, these factors often cause the previously undiagnosed and asymptomatic patient to develop symptoms during pregnancy, and in severe cases, experience profound cardiac decompensation.

In developing countries such as India, patients routinely present to the emergency room with severe eclampsia and are subsequently taken up for emergency caesarian section with minimal investigations. The physical signs of eclampsia masked those of mitral stenosis (pedal oedema, pulmonary crepitations, and raised heart rate masking any murmurs). The diagnosis of mitral stenosis was thus made post operatively.

### Conclusion

The purpose of this case report was to help the clinician become vigilant in the management of eclamptic patients as they can suddenly deteriorate without warning resulting in sudden cardiac arrest and death. The goals of perioperative management would be to maintain MAP of more than 65, restricted IV fluids and continuous ECG monitoring to avoid arrhythmias. Early identification of the disease, and the assessment of the severity of the lesion(s). The appreciation of the severity of risk incurred by both mother and fetus. High-risk lesions, for either mother or fetus, should be managed in a high care environment where invasive monitoring is possible, both pre- and post-delivery. Regional anesthesia techniques in labor are an attractive option, and may be employed with good outcomes in many patients.

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