Maternal Mortality in Cardiac Pregnancy: Ethical Conflicts in Patient Autonomy and Clinical Decision-Making

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Abstract

Maternal mortality remains a significant concern in pregnancies complicated by heart disease, especially when patient preferences diverge from evidence-based clinical recommendations. These situations present complex clinical and ethical challenges for healthcare providers. This case report illustrates the interplay between patient autonomy, clinical decision-making, and outcomes in high-risk cardiac pregnancy. A 34-year-old multiparous woman with known cardiomegaly and valvular heart disease presented at 37–38 weeks' gestation with worsening dyspnea, cardiac decompensation, and pulmonary hypertension. Despite medical advice recommending immediate delivery at a tertiary care center, she initially declined intervention. She later returned with severe preeclampsia and pulmonary hypertension. An emergency caesarean section was performed, but her condition deteriorated postoperatively, culminating in cardiac arrest and death. This case underscores the ethical tension between honoring patient autonomy, the right to make informed decisions, and the principle of beneficence, which obligates clinicians to act in the patient's best interest. Decision-making was shaped by educational background, limited health literacy, cultural norms, family influence, and potential mistrust of the healthcare system, all of which may compromise truly informed consent. Addressing these barriers requires clear, accessible, and culturally attuned communication to ensure patients comprehend the risks and benefits. Integrating structured shared decision-making and early ethics consultation can help resolve conflicts, align care with patient values, and safeguard maternal and fetal outcomes. Ethical management demands a careful balance between respecting autonomy and preventing harm, while advocating for systemic reforms that address the social determinants of maternal health. Timely multidisciplinary care, culturally sensitive counseling, and structured shared decision-making are essential to harmonize patient autonomy with life-saving interventions in high-risk cardiac pregnancies, thereby reducing preventable maternal mortality.

Keyword: Ethical Dilemmas, Maternal Mortality, Cardiac Disease In Pregnancy.

INTRODUCTION

Pregnancy in women with pre-existing cardiac disease poses a significant clinical challenge, as maternal morbidity and mortality rates are markedly higher than in the general obstetric population (Türkmen & Akar İnan, 2025). Among the various cardiac conditions, valvular heart disease and cardiomegaly are particularly associated with a heightened risk of decompensation due to the hemodynamic stresses of pregnancy (Jennifer Lewey; et al., 2021). The physiological adaptations of gestation, including increased blood volume, elevated cardiac

output, and hormonal fluctuations, can exacerbate underlying cardiac dysfunction, complicating clinical management and necessitating coordinated multidisciplinary care (DeFilippis et al., 2023). Decisions regarding the timing and mode of delivery are often complex, requiring a careful balance between maternal and fetal risks (Whybrow et al., 2022).

Valvular heart disease (VHD) remains a major contributor to maternal morbidity and mortality worldwide, particularly in low- and middle-income countries where rheumatic heart disease remains prevalent. Globally, VHD affects an estimated 1–4% of pregnancies, with significantly higher rates in regions where rheumatic disease is endemic (Aracil Moreno et al., 2024). Among cardiac pathologies, both valvular heart disease and cardiomegaly carry a high risk of decompensation due to the hemodynamic stresses imposed by pregnancy. Physiological changes, including a 30–40% increase in blood volume, elevated cardiac output, and hormonal fluctuations, can exacerbate underlying cardiac dysfunction, complicating antepartum and intrapartum management (Morton, 2021). These hemodynamic shifts, including increased plasma volume, cardiac output, and heart rate, may unmask or worsen valvular dysfunction. The clinical impact varies by lesion type and severity: stenotic lesions, particularly mitral and aortic stenosis, are associated with increased risk of pulmonary edema, arrhythmias, and maternal death, whereas regurgitant lesions are generally better tolerated due to the physiological reduction in systemic vascular resistance (Sahu et al., 2021).

A critical yet often controversial aspect of managing pregnant women with cardiac disease is the role of patient preference. Respecting patient autonomy is a foundational ethical principle; however, it can conflict with clinical recommendations intended to minimize risk, particularly when patients refuse or delay medically indicated interventions (Varkey, 2021). Evidence-based guidelines, such as those from the European Society of Cardiology (ESC), advocate for early risk stratification, close multidisciplinary surveillance, and timely delivery planning to reduce adverse outcomes (Lau et al., 2024). Nonetheless, clinical decision-making may be impeded when patient preferences diverge from medical advice. Refusal or delayed acceptance of recommended interventions, especially in resource-limited or culturally sensitive settings, can critically impact outcomes, yet this dimension remains underexplored in the literature (Tringale et al., 2022). The tension is further amplified in vulnerable populations, where social determinants, cultural beliefs, and limited health literacy significantly influence decision-making (Coughlin et al., 2017).

Optimal management of pregnant patients with cardiac disease necessitates a multidisciplinary approach involving obstetricians, cardiologists, and other relevant specialists (Husey et al., 2017). Despite advances in diagnostic and therapeutic strategies, clinical

decision-making remains challenging due to the need to balance the risks of cardiac complications against the physiological demands of pregnancy. In such contexts, honoring patient autonomy while mitigating harm requires nuanced, culturally competent counseling and structured shared decision-making (Ilori et al., 2024). This ethical tension becomes especially acute in cases of advanced cardiac disease complicated by pregnancy, where delays in intervention can swiftly lead to pulmonary hypertension, severe preeclampsia, and maternal death. This case review explores these challenges through the lens of a 34-year-old woman with atrial septal defect, valvular heart disease, and cardiomegaly, whose pregnancy was further complicated by pregnancy-induced hypertension and pulmonary hypertension, to illustrate the dynamic interplay between patient autonomy, clinical decision-making, and outcomes in high-risk cardiac pregnancy.

METHODS

This study combines a single case report with a narrative review of the literature. The clinical case was obtained from the medical records of a patient managed at Hasan Sadikin Hospital. Data were retrieved retrospectively and included patient history, physical examination findings, laboratory and imaging results, diagnosis, treatment course, and clinical outcome. Strict measures were taken to ensure confidentiality and preserve patient anonymity.

To complement the case analysis, a structured literature search was conducted using PubMed, Scopus, and Google Scholar. The search strategy employed the keywords: “Ventricular Septal Defect,” “Valvular Heart Disease,” “Pulmonary Hypertension,” “High-Risk Pregnancy,” and “Ethical Dilemmas.” Relevant articles were reviewed in full text. Inclusion criteria were: (1) publications in English from the past five years; (2) studies addressing congenital heart disease, valvular lesions, pregnancy outcomes, or ethical considerations in maternal cardiology; and (3) original research articles, systematic reviews, case reports, or clinical guidelines. Exclusion criteria included non-English publications, articles with only an abstract available, and studies not directly related to the case contextThe final selection comprised 32 articles, each critically appraised for quality and thematic relevance. The screening and selection process was conducted independently by two reviewers, with any disagreements resolved through discussion to minimize selection bias. The selected literature was organized into three primary themes: (1) clinical aspects, including diagnosis, maternal and fetal outcomes, and management strategies; (2) ethical considerations, focusing on decision-making and maternal autonomy; and (3) guideline comparisons, highlighting international recommendations from cardiology and obstetrics societies. The extracted data

were synthesized narratively and integrated with the case findings to illuminate diagnostic challenges, therapeutic approaches, and ethical dilemmas in the management of pregnant women with valvular heart disease.

RESULTS

A 34-year-old woman (G4P2A1) at 37–38 weeks of gestation presented with a one-week history of progressive shortness of breath, which had acutely worsened three hours prior to admission. The dyspnea was exacerbated by physical activity and alleviated in the sitting position. She also reported bilateral lower limb edema persisting for one week. Fetal movements were still perceived, and she denied chest pain, vaginal bleeding, or fluid leakage.

She had been diagnosed with hypertension one month earlier (blood pressure 170/100 mmHg) but was non-compliant with antihypertensive therapy. There was no prior history of hypertension before pregnancy, and she denied associated symptoms such as headache, visual disturbances, nausea, or vomiting. Cardiomegaly had been documented since 2015, and valvular heart disease, likely rheumatic in origin, since 2017, with regular cardiology follow-up. She had been on antiplatelet therapy, which she discontinued upon learning of her pregnancy. Despite repeated cardiology recommendations for early termination and delivery at a tertiary care facility due to her high-risk condition, the patient declined intervention until late gestation. Upon admission, she was classified as NYHA Class IV heart failure, with severe preeclampsia and echocardiographic evidence of pulmonary hypertension. A multidisciplinary team proceeded with an emergency caesarean section under regional anesthesia. A male infant was delivered with Apgar scores of 7 and 8 at one and five minutes, respectively, a birth weight of 3,030 grams, and no immediate complications.

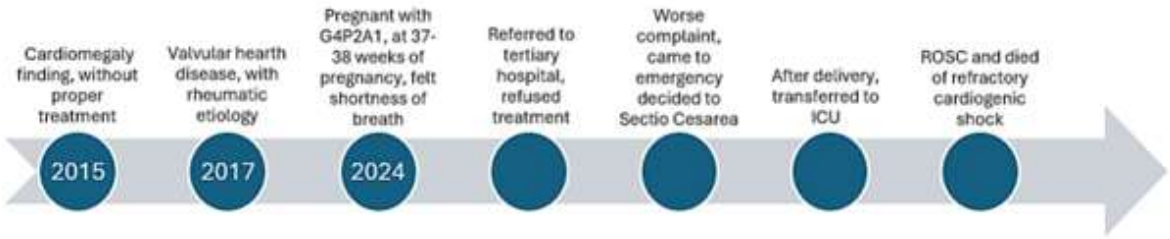

Figure 1. Timeline Clinical Progression of Disease

Postoperatively, the patient was transferred to the intensive care unit (ICU) for invasive monitoring, diuretic therapy, and supplemental oxygen. Twelve hours later, she developed hypotension requiring vasopressor support with a norepinephrine infusion. She subsequently experienced pulseless ventricular tachycardia, followed by asystole. Advanced cardiac life support was initiated, resulting in three episodes of return of spontaneous circulation (ROSC).

Despite maximal pharmacologic and mechanical resuscitation efforts, the patient succumbed to refractory cardiogenic shock secondary to decompensated valvular heart disease and pulmonary hypertension.

DISCUSSION

Evaluation and Management Perspectives

Pregnancy in women with pre-existing cardiac conditions presents a significant clinical challenge due to the complex interplay of hemodynamic, hormonal, and metabolic changes(Sethi & Kumar, 2020). These physiological demands, particularly increased plasma volume, elevated cardiac output, and heightened oxygen requirements, can overwhelm compromised cardiac function (Türkmen & Akar İnan, 2025). Valvular heart disease and atrial septal defect (ASD), especially when complicated by pulmonary hypertension and cardiomegaly, substantially elevate the risk of cardiovascular decompensation, particularly during the third trimester and peripartum period(Nashat et al., 2018). In this case, the patient's underlying ASD and valvular pathology, compounded by pulmonary hypertension and cardiomegaly, resulted in a critically fragile cardiovascular reserve.

The patient's risk was further exacerbated by the onset of hypertension in late pregnancy. Individuals with underlying cardiac conditions are particularly vulnerable to decompensation during the third trimester and peripartum period, when hemodynamic strain reaches its peak(Yang et al., 2023). Earlier guideline-based interventions, such as pregnancy termination or controlled delivery at an optimal gestational age, could have mitigated the risk of mortality (Jennifer Lewey; et al., 2021). Unfortunately, delayed care and refusal of medical recommendations culminated in a preventable maternal death. The World Health Organization (WHO) classification for cardiovascular risk in pregnancy offers a structured framework for stratifying patients based on disease severity and associated risks. Women with unrepaired moderate-to-large atrial septal defects (ASDs), or those with complications such as pulmonary hypertension, are categorized as WHO Class III or IV, indicating a substantially elevated risk of maternal morbidity and mortality (Souza et al., 2020). The New York Heart Association (NYHA) functional classification also assists in evaluating symptom burden, with Classes III and IV associated with poorer outcomes.

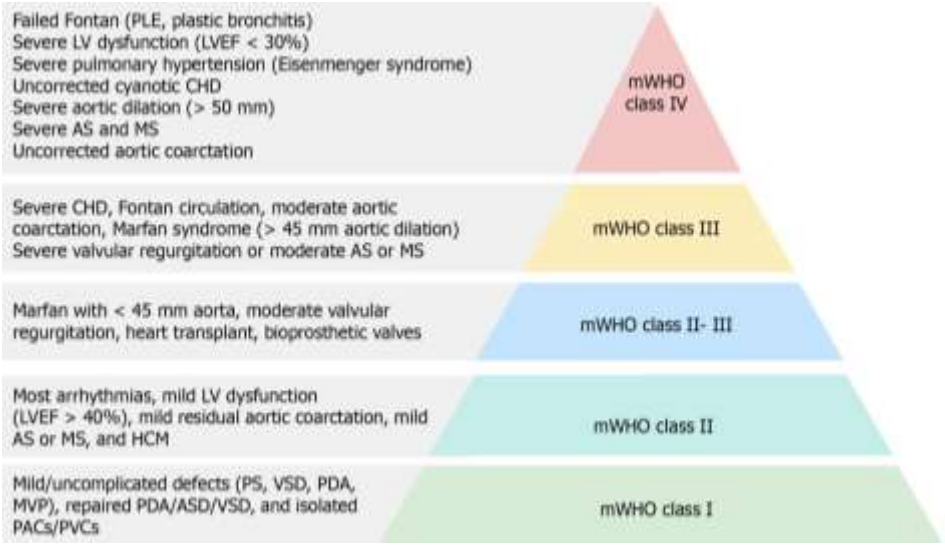

Figure 2. WHO Cardiovascular Risk Classification (Das et al., 2025)

In addition to the WHO and NYHA classifications, risk-scoring tools such as CARPREG II and ZAHARA offer individualized risk estimates by incorporating variables such as prior cardiac events, baseline functional status, and ventricular function. Guidelines from the European Society of Cardiology (ESC) and the American College of Obstetricians and Gynecologists (ACOG) recommend the early use of these tools during pregnancy to inform care planning and optimize outcomes (Kha et al., 2023).

Early and regular antenatal care is essential for women with known cardiovascular disease, as it enables timely risk stratification, diagnostic evaluation, and the implementation of individualized management plans(Türkmen & Akar İnan, 2025). In this case, the absence of early collaboration between cardiology and obstetrics teams represented a missed opportunity for intervention. Although the patient was aware of her cardiac condition, she delayed seeking care and discontinued antiplatelet therapy upon learning of her pregnancy—potentially due to fear, misinformation, or limited understanding of the associated risks (Yevoo et al., 2018). Clinical guidelines recommend that high-risk cardiac patients be referred to specialized cardiac-obstetric units early in pregnancy. A coordinated care model includes serial cardiac assessments, pharmacologic adjustments to maintain hemodynamic stability, and patient education on symptom monitoring and treatment adherence (Souza et al., 2020). Additionally, delivery planning should be initiated in the second trimester, with contingency strategies in place for clinical deterioration. These standards were not met in this case, largely due to the patient's delayed presentation and disengagement from care, underscoring the need for early risk identification systems and proactive patient outreach mechanisms.

Delivery planning is a critical component of managing cardiac pregnancies. For stable patients with uncomplicated atrial septal defects (ASDs), vaginal delivery is generally

considered safe. However, in cases of significant cardiopulmonary compromise, such as the one presented here, cesarean delivery may be preferred to avoid the hemodynamic fluctuations associated with labor (Das et al., 2025). In such scenarios, elective delivery at a tertiary care center under the supervision of a multidisciplinary team is strongly recommended. Although the cardiologist advised pregnancy termination and early delivery, the patient deferred care until the late third trimester, ultimately requiring an emergency cesarean section. This case highlights the importance of individualized risk assessment, incorporating echocardiographic findings, NYHA functional classification, and comorbid conditions such as hypertension and elevated pulmonary vascular resistance (Souza et al., 2020). When patients present late or experience acute decompensation, the opportunity for personalized planning diminishes, and emergency interventions carry a significantly higher risk of adverse maternal outcomes.

Ethical Analysis: Autonomy vs. Beneficence

One of the central ethical dilemmas highlighted by this case is the tension between patient autonomy and the clinician's duty of beneficence. Autonomy empowers patients to make informed decisions about their care, even when those decisions diverge from medical recommendations. In this instance, despite repeated counseling and strong recommendations for early delivery at a tertiary care facility, the patient declined intervention and delayed presentation (Zolkefli, 2024). This scenario exemplifies a common challenge in maternal-fetal medicine: patients may exercise their right to refuse interventions that, from a clinical perspective, are in their best interest.

From the perspective of Beauchamp and Childress' Four Principles of Biomedical Ethics, the principle of beneficence obligated clinicians to act in the patient's best interest by advocating for early delivery to reduce maternal risk (Vearrier & Henderson, 2021). However, respecting autonomy required acceptance of the patient's decision, provided it was both informed and voluntary. This raises a critical question: was the refusal truly informed? (Varkey, 2021). Informed consent is ethically valid only when patients fully understand the nature, benefits, and risks of the available options. Communication must be tailored to the patient's language, literacy level, and cultural context (Pietrzykowski & Smilowska, 2021). Fear, misinformation, and social pressures can impair comprehension, suggesting that apparent autonomy may be more constrained than it initially appears.

The patient's refusal raises critical questions about the adequacy of informed consent (Id et al., 2021). The quality-of-care hinges on whether the patient fully understood the severity of her condition. It is equally important to assess whether the risks were communicated in a culturally and linguistically appropriate manner to ensure comprehension of her diagnosis and

treatment options (Vandecasteele et al., 2024). Holistic, patient-centered care requires an understanding of the patient's values, anxieties, and social context. These factors underscore the importance of empathy and shared decision-making in clinical practice. Improved maternal outcomes in complex cardiac pregnancies are closely linked to addressing socioeconomic determinants of health (Id et al., 2021). True informed consent involves more than verbal disclosure, it requires ensuring comprehension, supporting autonomous decision-making, and fostering trust between patients and providers (Graham et al., 2024).

In situations where maternal or fetal life is at imminent risk, some jurisdictions permit the temporary suspension of patient autonomy to preserve life. However, such circumstances are ethically complex and relatively rare (Chrvenak & McCullough, 2019). More commonly, shared decision-making models are employed to align patient preferences with clinical judgment. In high-stakes scenarios such as cardiac pregnancy, this approach requires early and ongoing counseling, multidisciplinary collaboration, and, when necessary, ethics consultations to support both the patient and the healthcare team (Id et al., 2021).

The patient's refusal of early termination and non-compliance with medication may not reflect simple defiance of medical advice, but rather deeper social and structural influences. Social determinants of health, such as limited education, poor health literacy, economic hardship, cultural beliefs, and restricted access to care, play a significant role in shaping health behaviors and outcomes (Coughlin et al., 2017). For example, women from marginalized communities may delay seeking care due to logistical barriers, fear of stigma, or reliance on informal care networks (Teshale et al., n.d.). Cultural norms surrounding motherhood, religious objections to pregnancy termination, and mistrust of the medical system may also influence decision-making (Drigo et al., 2021).

Health systems must acknowledge these contextual factors and implement culturally sensitive, community-based interventions to promote informed and equitable care. Such efforts may include trained health navigators, culturally competent counseling, and targeted outreach to identify and engage at-risk women early in pregnancy. Shared decision-making (SDM) is particularly vital in managing chronic conditions during pregnancy. It involves a bidirectional exchange in which clinicians present evidence-based options and patients articulate their values and preferences(Montori et al., 2023). Effective SDM in cardiac pregnancy requires early multidisciplinary coordination, involving obstetricians, cardiologists, anesthesiologists, and, when appropriate, mental health or social support professionals. In this case, earlier and sustained decision-making efforts might have clarified the risks of continuing the pregnancy, provided emotional and psychosocial support, and facilitated a care pathway more acceptable

to the patient. The inclusion of family or community leaders, when culturally appropriate, can also help bridge gaps between clinical recommendations and patient values.

This case underscores the urgent need for system-level interventions to reduce maternal mortality among women with cardiac disease. Key recommendations include early risk identification: all women should undergo cardiovascular risk screening at their first antenatal visit, with prompt referral of high-risk cases to tertiary care centers. Standardized care protocols should be developed for managing cardiac disease in pregnancy, incorporating WHO risk classification, echocardiographic monitoring, and structured delivery planning checklists(Türkmen & Akar İnan, 2025). Healthcare providers should receive training in counseling, cultural sensitivity, and risk communication tailored to populations with low literacy or high vulnerability. Peer support programs, group antenatal care models, and digital health tools can be integrated to enhance compliance and engagement among high-risk patients. Finally, policies must be promoted to ensure equitable access to specialized maternal cardiac care, particularly in rural and underserved regions.

Practice-Based Recommendations

Effective management of cardiac disease in pregnancy begins with early risk stratification, utilizing tools such as CARPREG II, ZAHARA, and modified WHO (WHO) classifications during the initial antenatal visit. A recent Thai study involving 333 pregnancies complicated by cardiac disease found that CARPREG II offered the most accurate prediction of adverse cardiac events overall, particularly in cases of congenital heart disease (Poungsuntorn et al., 2025). These findings highlight the importance of timely risk screening using validated models to guide escalation decisions and support individualized care planning.

Once high-risk status is identified, establishing specialized care pathways becomes essential. International guidelines consistently recommend that high-risk pregnant women be managed in tertiary care centers equipped with multidisciplinary cardio-obstetric teams, including cardiologists, obstetricians, anesthesiologists, and critical care specialists, to address the complex needs of these patients (DeFilippis et al., 2023). Such teams can optimize diagnosis, treatment, and outcomes in cases of peripartum heart failure, while fostering patient-centered care and strengthening therapeutic alliances.

Equally important is the enhancement of culturally sensitive risk communication. Healthcare providers should be trained to use visual aids for patients with low health literacy and to involve family or community leaders when appropriate (Tringale et al., 2022). Although few studies have examined this directly in recent years, the principle of patient-centered counseling is embedded in the multidisciplinary care approaches endorsed by the European

Society of Cardiology (ESC) and the American Heart Association (AHA). Multidisciplinary decision-making should begin early in pregnancy and include joint consultations between cardiology and obstetrics teams, with ethics consultation as needed in cases of refusal or complex decision-making scenarios(Das et al., 2025). At the health system level, policy strengthening plays a critical role. The implementation of standardized screening protocols at the population level has enabled early identification of high-risk women, with 93% of those in a maternal mortality series screening positive prior to death, and 8% of general obstetric patients screening positive and being appropriately referred (Hameed et al., 2023). These findings support the expansion of subsidized screening and referral systems, coupled with community health worker engagement, to improve outreach and care access in underserved populations.

CONCLUSIONS

This case illustrates the fatal consequences of pregnancy in women with complex cardiac comorbidities, atrial septal defect, valvular heart disease, and pulmonary hypertension, when timely risk identification and referral are lacking. Despite guideline-based recommendations for early delivery and specialized care, the patient's refusal and delayed presentation resulted in a preventable maternal death. The ethical tension between autonomy and beneficence in this scenario underscores the critical importance of truly informed consent, facilitated through culturally adapted, family-inclusive counseling. At a systemic level, the case highlights how deficiencies in early risk stratification, referral pathways, and access to tertiary care continue to drive avoidable maternal mortality, particularly in low- and middle-income countries. Institutional protocols should prioritize early cardiovascular risk assessment at the first antenatal visit, culturally sensitive counseling strategies, and structured referral pathways to multidisciplinary cardio-obstetric teams. Strengthening these practices at both clinical and policy levels is essential to reducing preventable maternal deaths associated with cardiac disease in pregnancy.

SUGGESTION

To mitigate the social impact of maternal cardiac complications, healthcare systems should reinforce multidisciplinary care, expand access to specialized cardiac-obstetric services, and offer psychosocial and financial support to affected families, particularly in underserved communities.

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