Cardiac Disease in Pregnancy

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KEYWORDS

• Cardiac disease • Pregnancy • Valvular disease • Congenital heart disease

KEY POINTS

- Physiologic changes in pregnancy can place extra demands on cardiac function.
- Preconception counseling is key to improving pregnancy outcomes.
- The most commonly encountered cardiac events are pulmonary edema and dysrhythmias.
- A team approach to antepartum care is recommended and should include maternal-fetal medicine, cardiology, and anesthesia as indicated, particularly for patients with congenital cardiac disease.

INTRODUCTION

Cardiac disease complicates approximately 4% of all pregnancies in the United States; however, these patients are at a disproportionately increased risk for maternal deaths (10%–25%).[1,2] Congenital cardiac lesions are 3 times more common than acquired, adult-onset abnormalities in pregnant patients. Intensive care unit (ICU) admissions because of maternal cardiac disease comprise up to 15% of obstetric ICU admissions, but these patients account for up to 50% of all maternal deaths in the ICU.[3–9] The incidence of acute coronary events is also increasing in pregnancy because of older childbearing age along with a higher incidence of hypertension and obesity in women.[10]

Common complaints of normal pregnancy, such as dyspnea, fatigue, palpitations, orthopnea, and pedal edema, mimic symptoms of worsening cardiac disease and can create challenges for clinicians when evaluating pregnant patients with cardiac disease. Nevertheless, these patients are at risk of developing cardiac decompensation and adverse pregnancy outcomes based on the type of cardiac lesion. Pregnancy can have a negative influence on systolic and diastolic function in women with structural heart disease, which can persist 6 months after pregnancy.[11]

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PHYSIOLOGIC CHANGES OF SINGLETON PREGNANCY

Comprehensive understanding of the normal physiologic adaptations to pregnancy is essential to the successful management of patients with cardiac disease. Conditions that may be asymptomatic while nonpregnant can deteriorate in the pregnant state. **Box 1** outlines key physiologic changes in a normal singleton gestation. Multiple gestations can be expected to have more dramatic physiologic changes.

COUNSELING THE PATIENT

Establishing baseline cardiac function is essential for pregnant cardiac patients. Functional status for patients with cardiac disease is commonly classified according to the New York Heart Association (NYHA) classification system, as outlined in **Box 2**. Patients in NYHA class I or II have less risk of complications compared with those in class III or IV.[12] **Box 3** classifies various cardiac abnormalities according to maternal death risk estimates; however, the patient's particular history is not included in these estimates.[13]

In a recent study of almost 600 pregnancies complicated by maternal cardiac disease, the investigators created a risk score to predict the likelihood of a maternal cardiovascular event in the presence of specific predictors for maternal complications[14]: **Box 4** outlines risk prediction according to the cardiac disease in pregnancy (CARPREG) risk score.

The most commonly encountered cardiac events are pulmonary edema and dysrhythmias. One large, multinational study of more than 1300 patients with cardiac disease showed that the most common obstetric complication is gestational hypertension or preeclampsia.[15] Maternal mortality is of highest risk for patients with coronary artery disease, pulmonary hypertension, endocarditis, cardiomyopathy, and dysrhythmias.[16,17]

Neonatal complications include small-for-gestational-age infants, delivery before 34 weeks' gestation, and neonatal death.[18] Fetal mortality approaches 2% in pregnancies with maternal heart disease.[15] Structural cardiac anomalies (excluding autosomal dominant disorders) occur in 2% to 18% of fetuses born to patients with a history of congenital cardiac disease. Therefore fetal echocardiogram is recommended for all pregnant patients with structural cardiac defects.

Even after delivery, these patients remain at high risk for complications in the postpartum period, with approximately 10% to 15% having at least 1 episode of heart failure during or after pregnancy.[15] In one study of 100 patients, postpartum complications were seen in about 4% of NYHA I/II patients and in 27% of NYHA III/IV patients.[19]

Preconception care
- Baseline evaluation of cardiac function.
- Counseling regarding pregnancy risk for mother and fetus.
- Consultation with cardiologist and maternal-fetal medicine specialist, if possible.
- Review of current medications to determine appropriateness of continuing during pregnancy.
- Routine preconception care as for all patients: assessment of immunization status, screening for genetic diseases as indicated, supplemental folic acid.

Antepartum care
- A team approach to antepartum care is recommended and should include maternal-fetal medicine, cardiology, and anesthesia as indicated, particularly for patients with congenital cardiac disease.
- Patients should be evaluated regularly for signs and symptoms of cardiac decompensation.
- Fetal echocardiogram between 20 and 24 weeks' gestation is indicated in the presence of congenital heart disease in mother.