

## Aortic Stenosis

Aortic stenosis in a pregnant woman is usually congenital in origin. Patients with significant outflow obstruction may develop angina or heart failure during the later portion of the pregnancy as cardiac output increases. Supportive therapy includes bedrest and prevention of hypovolemia. If these measures fail to control symptoms and the fetus is not near term, balloon valvuloplasty, transaortic valve replacement, or aortic valve surgery should be considered to reduce the risk for maternal death.

## Marfan Syndrome

Pregnant women with Marfan syndrome are at an increased risk for aortic dissection and rupture, especially during the third trimester and the first postpartum month. Patients with an aortic root diameter greater than 40 mm are at greatest risk for this complication and should strongly consider therapeutic abortion during the first trimester. Women with an aortic root diameter less than 40 mm should have serial echocardiograms to monitor the size of the aortic root during pregnancy. In addition, restriction in physical activity and treatment with a  $\beta$ -blocker may help prevent further dilation of the aorta.

## Congenital Heart Disease

Survival to reproductive age is common in patients with corrected congenital defects. The risk for pregnancy in these patients is related to the completeness of the repair and the mother's functional capacity. Uncomplicated atrial or ventricular septal defects not associated with symptoms or pulmonary hypertension are usually well tolerated during pregnancy. Intracardiac shunts associated with pulmonary vascular hypertension are associated with a high maternal mortality rate during pregnancy as a result of increased right-to-left shunting and worsening oxygen desaturation of the blood. In these women, pregnancy is contraindicated. If pregnancy occurs, a therapeutic abortion during the first trimester should be recommended. Women with uncorrected tetralogy of Fallot should undergo palliative or definitive repair before conception to improve maternal and fetal outcomes. Women with residual obstruction of the right ventricular outflow tract remain at high risk for right ventricular heart failure during pregnancy.

## Prosthetic Heart Valves

Most patients with a normal-functioning prosthetic valve tolerate pregnancy without complications. However, in patients with mechanical valves, special attention to the choice and dose of anticoagulant therapy is necessary to avoid thromboembolic complications in the mother and teratogenic effects in the fetus. Women should start subcutaneous heparin before conception to avoid the potential teratogenic effects of warfarin during the first several months of critical fetal organ development. This therapy can be continued throughout pregnancy, or, alternatively, warfarin can be reinstated late in the second trimester or during the third trimester. Although heparin therapy confers less risk of teratogenicity than warfarin use, it is associated with a high risk for maternal bleeding complications. Low-molecular-weight heparin may be an acceptable alternative, but no firm data are available to support this recommendation. At the time of

delivery, anticoagulation therapy is interrupted to avoid bleeding complications. Antibiotic prophylaxis is usually not recommended at the time of delivery.

## Heart Disease Arising During Pregnancy

Cardiovascular disease can develop during pregnancy and may pose a significant risk to the mother and fetus. Hypertension is not an uncommon problem during pregnancy and is defined as a consistent increase in blood pressure of 30/15 mm Hg or an absolute blood pressure greater than 140/90 mm Hg. The three major forms of hypertension that may develop during pregnancy are chronic hypertension, gestational hypertension, and toxemia. Toxemia is a form of hypertension that develops during the second half of pregnancy and is associated with proteinuria, edema, and, in severe forms, seizures. This problem is primarily managed by the obstetrician and is not discussed in this text. Gestational hypertension is an elevation in blood pressure that occurs late in the pregnancy, during delivery, or during the first postpartum days. This disease entity is not associated with proteinuria or edema and resolves within 2 weeks after delivery.

Chronic hypertension is presumed to be present if an elevation in blood pressure is detected before the 20th week of pregnancy. No matter what the cause, fetal mortality correlates with the severity of the hypertension and begins to rise when the diastolic pressure exceeds 75 mm Hg during the second trimester or 85 mm Hg during the third trimester. Initial treatments include a reduction in physical activity and salt restriction. If the blood pressure remains greater than 150/90 mm Hg, then antihypertensive treatment should be instituted. Agents that have been safely used in pregnancy include hydralazine,  $\alpha$ -methyl dopa, clonidine,  $\beta$ -blockers, and labetalol. Diuretics should be used with caution because of the increased risk for placental hypoperfusion.

Peripartum cardiomyopathy (PCM) is a form of dilated cardiomyopathy that may begin during the last trimester of pregnancy or within the first 6 months after delivery in a woman without prior heart disease or other definable causes for cardiac dysfunction. The true incidence of the disease is unknown, but estimates conclude that 1 in every 3000 to 4000 pregnancies is affected. Although the cause of PCM is unknown, myocardial injury is thought to be immunologically mediated. Women usually exhibit symptoms and signs of congestive heart failure. Echocardiography is useful to assess chamber size and degree of ventricular dysfunction. The outcome with PCM is variable, with death or progressive heart failure occurring in about one third of affected women. The prognosis is particularly poor if symptoms develop before delivery. Despite this risk, many patients have complete recovery of ventricular function, although recurrence is possible, especially with subsequent pregnancies. Treatment is similar to that for congestive heart failure (see [Chapter 6](#)) and usually includes the use of vasodilators such as hydralazine, digoxin, and diuretics. Angiotensin-converting enzyme inhibitors have been associated with increased fetal wastage in pregnant animals and should be avoided. A thorough evaluation of cardiac function should be performed before subsequent pregnancies. If a woman decides to proceed with another pregnancy, she should be monitored regularly for signs of cardiac decompensation.

