HEART DISEASE & PREGNANCY

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VENTRICULAR SEPTAL DEFECTS

Background

Ventricular septal defects (VSD) are among the most common congenital heart lesions. They can occur in isolation or as part of more complex congenital heart defects. This section covers isolated VSD. They are characterized by their location (perimembranous/membranous, muscular, supracristal or inlet VSD) and size. Inlet VSDs (atrioventricular septal defects) are more complex and not discussed here.

Depending on their size, VSD can lead to volume overload of left-sided heart chambers and/or pulmonary hypertension with pressure overload of the right ventricle. Large VSD usually lead to symptoms early in life. If they do not spontaneously regress, they often require surgical or interventional closure in childhood. VSD in adult patients are usually small and restrictive. If large VSD are encountered in the adult population, they are commonly associated with Eisenmenger syndrome (see Eisenmenger Syndrome) or part of complex congenital heart disease (i.e. unoperated tetralogy of Fallot).

Effects of pregnancy-related hemodynamic changes

Pregnancy is associated with significant hemodynamic changes including an increase in cardiac output and blood volume and a decrease in peripheral vascular resistance. (see Cardiovascular Changes During Pregnancy) In women with an isolated small or moderate sized VSD, or women with a surgically closed VSD without pulmonary hypertension, and normal ventricular function, these changes are usually well tolerated. The decrease in systemic vascular resistance may decrease left-to-right shunt flow and therefore women with larger VSD, especially those with some degree of pulmonary hypertension, are at risk for shunt reversal.

Women with VSD and associated pulmonary hypertension and cyanosis (Eisenmenger syndrome) tolerate the hemodynamic changes of pregnancy poorly. Their management is discussed elsewhere (see Eisenmenger Syndrome.)

Maternal complications

In women after surgical closure of a VSD in childhood or in women with a small or moderate sized VSD, pregnancy is usually well tolerated in the absence of ventricular dysfunction or pulmonary hypertension. Heart failure and arrhythmias are potential complications, but occur very infrequently. (1,2,3) There are other cardiac characteristics that can have an impact on outcomes (see General Considerations).

Fetal complications

Premature delivery and small for gestations age babies occur in 11.8% and 1.4% of pregnancies respectively. (3)

Management strategies

Preconception counseling/contraceptive methods

Most women with a repaired VSD or a residual small/moderate sized VSD can have a successful pregnancy. In the absence of ventricular dysfunction or pulmonary hypertension, heart related complications are rare. Long-term consequences of pregnancy on ventricular dilatation or dysfunction are not well known.

Ideally, a comprehensive cardiovascular examination should be undertaken before embarking on pregnancy. This includes a careful history and physical examination, an echocardiogram and an electrocardiogram. The additional prognostic benefit of cardiopulmonary exercise testing has not been defined, but that test may be helpful in some cases.

The indications for surgical or interventional closure of a VSD follow published guidelines. (4) Women should not undergo surgery for the sole purpose of reducing risk during pregnancy.

Transmission of congenital heart disease to offspring should be discussed. The risk of transmission of congenital heart disease is between 5-10%, compared to a background risk of 1% of having a baby with congenital heart disease.

A discussion about contraceptive methods is appropriate in all women with repaired or unrepaired VSD. In the absence of ventricular dysfunction or pulmonary hypertension, the choice of contraceptive measures is not limited by cardiac disease. (see Contraception)

Medications use should be reviewed if a woman is seriously contemplating pregnancy or is pregnant. The MOTHERISK website is an excellent resource. (http://www.motherisk.org)

Ante-partum care

The place and frequency of antenatal visits with the cardiologist depends on the size of the VSD, the function of the ventricles and the pulmonary pressures.

In women with large VSD, residual ventricular dysfunction or pulmonary hypertension (high-risk features), antenatal care should be provided by a dedicated multidisciplinary team of experienced cardiologists, obstetricians, and anesthetists at a high-risk pregnancy center.

In low risk women, depending on their preferences, antenatal care and delivery can be performed at non-specialized centers, as long as good communication with specialists at the tertiary center is established as well as plans for appropriate measures in case of unexpected complications.

All women should be offered fetal echocardiography at 20 weeks gestation.

Labour and delivery

In women with high-risk features, labour and delivery should be planned carefully with a multidisciplinary team well in advance. It is important to communicate the delivery plan to the woman and to other physicians involved in her care. The best delivery plan is not useful if information is not readily available when needed.

Generally, vaginal deliveries are recommended unless there are obstetric indications for a Cesarean delivery. Good pain management for labour and delivery is important in order to minimize maternal cardiac stress. Women with VSD and high-risk features may have forceps or vacuum delivery to decrease maternal expulsive efforts during the second stage of labour. To decrease potential harmful complications from difficult mid cavity-assisted delivery, uterine contractions are often utilized to facilitate the initial descent of the presenting part.

The need for maternal monitoring is dictated by the number of associated high-risk features and functional status of patients. Most women with repaired or unrepaired VSDs do not require special monitoring. In select instances, continuous monitoring with oximetry or electrocardiography may be helpful.

In general, endocarditis prophylaxis is not recommended in women with VSD. However, some experts continue to administer antibiotics because they feel that the risks of adverse reactions to antibiotics are small and the risk of developing endocarditis has major health consequences.

Although the risk for paradoxical embolism in women with residual interventricular shunts is lower than in women with residual interatrial shunts, air-particulate filters (bubble trap filters) are recommended for all intravenous lines, particularly in the setting of pulmonary hypertension.

Post-partum care

The hemodynamic changes of pregnancy may take up to six months to normalize. Women should be seen early after pregnancy (usually within 6-8 weeks). The frequency of additional follow up visits should be dictated by the clinical status of the women.

If a VSD is initially diagnosed during pregnancy, a complete assessment should be performed after delivery.

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