Aortic Valve Problems

Information for women who have a bicuspid aortic valve during pregnancy or breastfeeding

The information provided below is for readers based in the United States of America. Readers outside of the United States of America should seek the information from local sources.

What is a bicuspid aortic valve?

The aortic valve is the valve that regulates blood flow from the left ventricle of the heart to the aorta, the main artery of the body. In women of childbearing age, the aortic valve can malfunction, almost as frequently as the mitral valve (the valve regulating blood flow into the left atrium from the left ventricle) can malfunction. Aortic valve problems can be the result of rheumatic fever, a complication that can result when an infection with group A *Streptococcus*, the bacteria that causes strep throat, is not treated early enough with antibiotics. Mostly, however, and especially in developed countries where rheumatic fever is very rare, aortic valve problems in young women develop from congenital abnormalities in anatomical structure, essentially subtle malformations involving not just the aortic valve, but the aorta along with it. Normally, the aortic valve has three leaflets that separate and come together to regulate the passage of blood forward from the ventricle into the aorta and prevent the blood from flowing backward. However, if two of those leaflets fuse, then effectively the person has just two leaflets. This is called a *bicuspid* aortic valve (BAV). While such a valve can work just fine, it also makes the person prone to certain problems in the valve itself, in the aorta, and in the heart near the valve.

How common is bicuspid aortic valve during pregnancy?

Present in 12 percent of the population, BAV is the most common congenital heart malformation. This percentage carries over from the general population to pregnant women, but problems come about only when the BAV leads to complications.

How is bicuspid aortic valve diagnosed?

BAV is diagnosed with a technique called echocardiography, which is non-invasive and thus completely safe. This same technique can be used to diagnose complications of BAV, but doctors also

may use other imaging techniques, particularly computed tomography (CT) and magnetic resonance imaging (MRI) to evaluate a woman for certain complications. A proper workup of your case also must include a thorough medical history and physical examination, blood tests, and an electrocardiogram (ECG).

Does bicuspid aortic valve cause problems during pregnancy?

BAV can lead to several different serious complications. The most common such complication that occurs during pregnancy is called aortic *stenosis*, which is a narrowing of the valve, which makes it difficult for the heart to pump adequate volumes of blood quickly enough through the valve to support the woman. This gets worse as pregnancy progresses since there is an increased demand for blood flow as the baby develops. Another complication that can occur is atrial *regurgitation*, which also is called atrial *insufficiency*. This means that the valve leaflets (of which there normally are three, but only two in the case of BAV) do not close completely after the ventricle has contracted, pushing blood through the valve into the aorta.

Insufficiency and stenosis each can occur alone, or they can occur together, but each of these problems reduces the volume of blood that makes it into the aorta during a heartbeat. Another way of saying this is that these conditions both reduce the *ejection fraction*, the proportion of blood volume that is pumped out of the heart versus the blood volume of blood in the ventricle prior to the contraction. The ejection fraction of the left ventricle is normal if it is 55 percent or higher. In healthy people, the ejection fraction increases during exercise, and it increases to particularly high fractions in trained athletes. In contrast, insufficiency and stenosis of the aortic valve both reduce the ejection fraction, the former by allowing blood to return to the ventricle just after the contraction, the latter by reducing the size of the opening through which the blood must pass to leave the ventricle in the first place.

Another complication of BAV during pregnancy is called infective endocarditis, meaning infection of the inner layer of the heart. BAV also can lead to a complication called aortic dissection, which means that the aorta itself actually tears, a condition that can be quickly fatal.

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Does BAV during pregnancy cause problems for the baby?

There is a danger of losing the baby in the event that a severe complication of BAV develops, resulting in a drop in the mothers blood pressure, leading to reduced blood flow through the placenta. The extreme example of this would be aortic dissection. However, in women with a mild to moderate

amount of aortic stenosis (narrowing) due to BAV, the more severe complications are fairly unlikely, and it is unknown whether modest problems involving the aortic valve cause any problems for the developing baby.

What to consider about taking medications when you are pregnant or breastfeeding:

- The risks to yourself and your baby if you do not treat the aortic valve disease
- The risks and benefits of each medication you use when you are pregnant
- The risks and benefits of each medication you use when you are breastfeeding

What should I know about using medication to treat the complications of BAV during pregnancy?

The main strategies used to treat pregnant women with stenosis and insufficiency of the aortic valve are to slow the heart with drugs called beta-blockers and sometimes to decrease the blood volume with drugs called diuretics. Options are available from these drug groups that are fairly safe during pregnancy. If infection of the inner layer of the heart develops, antibiotics would be vital to the treatment, and antibiotics can be selected based on their level of safety in pregnancy.

Pregnant women whose valve condition causes the type of arrhythmia that can produce a thromboembolism cannot be given a medication called warfarin (nor a similar drug called acenocoumarol, used in Europe), as it can be very harmful to the developing baby, but they can be given an anti-clotting medication called heparin. Often, they are given a type of heparin called low molecular weight heparin (LMWH).

A group of drugs called ACE inhibitors must not be given during pregnancy as they can damage the developing baby's kidneys. Other drugs dangerous for the baby include angiotensin receptor blockers (used for lowering blood pressure), amiodarone (used to treat certain arrhythmias), and nitroprusside (used to open up blood vessels to improve blood flow); any woman taking these prior to pregnancy must be transitioned to other drugs that have similar effects, but are safe for pregnancy.

Who should NOT stop taking medication for aortic valve issues during pregnancy?

The risks to the mother and developing baby depend greatly on whether the BAV actually produces complications, and if so on the severity of the complications. Women with moderate to severe disease typically cannot be weaned from medication. At the same time, women with very severe aortic valve problems (severe stenosis and severe insufficiency), and those with aortic dissection are usually advised not to proceed with pregnancy in the first place.

What should I know about choosing a medication for my aortic valve condition during pregnancy?

Certain medications, such as ACE inhibitors, must not be given during pregnancy. You may find Pregistrys expert reports about the individual medications used to treat aortic valve issues here. Additional information can also be found in the sources listed at the end of this report.

What should I know about taking a medication for my aortic valve condition, or its complications, when I am breastfeeding?

The American Academy of Pediatrics has suggested that beta-blockers are safe during nursing of neonates, but that low doses should be considered until you are finished with the breast-feeding period. LMWH does enter breastmilk, but in very tiny amounts and is not harmful because it is degraded in the infants digestive system.

What alternative therapies besides medications can I use to treat BAV during pregnancy?

As noted earlier, the consequences of a valve condition depend on its severity. A BAV can produce a range of situations, from no symptoms at all to emergency situations such as endocarditis (infected inner layer of the heart, and often the valve) or aortic dissection. Often, women with severe heart conditions, including severe valve problems have been followed by cardiologists since childhood, and have been counseled to avoid pregnancy in the first place. But sometimes the drive to become a mother is so strong that it overwhelms the recommendations. This can lead to pregnancies in women whose valve disease is too severe to support pregnancy. In such cases, elective abortion is recommended, but if the woman still wishes to pursue the pregnancy, the next option is to perform a surgical procedure to improve the function of the valve.

Normally, surgery is a logical option in a woman who is of reproductive age but is not pregnant, because surgery can improve her condition, but it is complicated to perform surgery on a pregnant woman. However, when a woman with severe valve disease does get pregnant or when a woman with moderate valve disease gets pregnant and her condition worsens as a result of the pregnancy and when the woman refuses to have an abortion, the surgical options move to the top of the list. There are two general approaches to valve surgery. If the aortic valve is stenotic, but without anything else wrong with it, there is an option called *valvoplasty*. This means that the valve is literally widened by pushing it open with a balloon that is delivered through special tubing that is inserted through a blood vessel and directed to the heart. The other option is called aortic valve replacement, which means that an artificial valve is inserted to replace the failing valve. This strategy can be used as an alternative to valvoplasty in

a valve that is only stenotic, and is the only option when the valve also has other things going wrong. When valvoplasty or valve replacement becomes necessary, it is better to perform the surgery earlier in the pregnancy than later. Furthermore, in cases of aortic dissection, the woman may require emergency surgery.

One more option that may be appropriate in various situations involving aortic valve conditions is activity restriction. This means that your doctors can recommend that you do not walk around much, nor even stand much, especially toward the end of pregnancy.

What can I do for myself and my baby when I have an aortic valve problem during pregnancy?

Cooperate with your physicians, including taking all recommended drugs, and when appropriate limiting your activity.

Resources for aortic valve problems in pregnancy:

For more information about **aortic valve problems** during and after pregnancy, contact http://www.womenshealth.gov/ (800-994-9662 [TDD: 888-220-5446]) or check the following links:

- Cleveland Clinic: Pregnancy and Heart Disease
- Parents: Managing Heart Disease During Pregnancy

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General information

It is very common for women to worry about having a miscarriage or giving birth to a child with a birth defect while they are pregnant. Many decisions that women make about their health during pregnancy are made with these concerns in mind.

For many women these concerns are very real. As many as 1 in 5 pregnancies end in a miscarriage, and 1 in 33 babies are born with a birth defect. These rates are considered the background population risk, which means they do not take into consideration anything about the health of the mom, the

medications she is taking, or the family history of the mom or the baby's dad. A number of different things can increase these risks, including taking certain medications during pregnancy.

It is known that most medications, including over-the-counter medications, taken during pregnancy do get passed on to the baby. Fortunately, most medicines are not harmful to the baby and can be safely taken during pregnancy. But there are some that are known to be harmful to a baby's normal development and growth, especially when they are taken during certain times of the pregnancy. Because of this, it is important to talk with your doctor or midwife about any medications you are taking, ideally before you even try to get pregnant.

If a doctor other than the one caring for your pregnancy recommends that you start a new medicine while you are pregnant, it is important that you let them know you are pregnant.

If you do need to take a new medication while pregnant, it is important to discuss the possible risks the medicine may pose on your pregnancy with your doctor or midwife. They can help you understand the benefits and the risks of taking the medicine.

Ultimately, the decision to start, stop, or change medications during pregnancy is up to you to make, along with input from your doctor or midwife. If you do take medications during pregnancy, be sure to keep track of all the medications you are taking.