Treating the Pregnant Cardiovascular Patient: Lessons from a Maternal-Fetal Medicine Specialist

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When it comes to birth plans, Karolina Adam, M.D., isn't focused on the pros and cons of epidurals or water births. As a maternal–fetal medicine OB-GYN specializing in high-risk pregnancies, she only has one birth plan: "I want you to be able to walk out of the hospital with a baby in your arms," she tells her patients. "Anything else we can negotiate."

For many people, pregnancy is associated with the joyful addition of a new family member, and it may be difficult to imagine the potentially catastrophic complications. However, the sad truth is that pregnancy does not always go according to plan. In the United States, around 700 women die each year due to pregnancy-related complications.[1] Between 2011 and 2013, 2,009 maternal deaths occurred due to pregnancy-related causes and of those, the most common cause was cardiovascular disease (15.5% of maternal deaths). This does not include hypertensive disorders of pregnancy (7.4%) or stroke (6.6%).[2]

Dr. Adam, currently practicing at Houston Perinatal Associates, is the author of a review article on cardiovascular disease in pregnancy and has decades of experience in caring for these high-risk patients. Over the course of a pregnancy, a woman with cardiovascular disease has increased risk of worsening of her disease, acute heart failure, premature delivery, or death.[2]

Moreover, as more women are becoming pregnant later in life, new high-risk groups, including perimenopausal women undergoing in vitro fertilization, have formed. Older mothers are more likely to have chronic conditions like high blood pressure and coronary artery disease.[2] Pregnancies complicated by these conditions cannot be treated routinely and require the assistance of medical specialists, including a cardiologist and maternal–fetal medicine physician. Risks to mother and child can often be reduced with appropriate medications and careful follow-up with a multidisciplinary team—but starting early is key. Dr. Adam emphasizes that preconception counseling and early intervention are essential to give women the best chance at a healthy pregnancy outcome for both mother and child.

"Women with cardiovascular disease need to understand that their pregnancy is going to be different from that of their best friend or sister. We must discuss what kind of monitoring and changes in lifestyle are best for mom and baby," explains Dr. Adam. "All too frequently I see that women have become ill when we could have taken preventative measures months earlier. Instead, we get a late referral when the patient is already very sick."

Of course, in order for any of this counseling to occur, doctors need to know that their patient is pregnant. In Dr. Adam's experience, this critical diagnosis is overlooked more often than you might think.

"The first thing many physicians miss is the pregnancy itself," she says. "It happens every year to the best doctors. You get so focused on your patient and their disease that you forget that she could be pregnant. My favorite story is getting a call from a cardiologist who diagnosed a 20-week intrauterine pregnancy during a cardiac catheterization."

The cost of a late start to specialized care can be high. Unmanaged disease in the mother affects the fetus as well.

"We usually see prematurity; there's a much greater risk when we miss the opportunity to see the patient early. In those cases, we lose the chance to slow down the disease process, so we usually have to just stabilize the mother and deliver the baby early," Dr. Adam explains.

For every woman and every different disorder, recommendations vary, which is why every high-risk patient must meet with specialists to craft a plan specific to their pregnancy. Thus, Dr. Adam encourages primary care physicians and cardiologists to discuss pregnancy risks with reproductive-age women who are diagnosed with cardiovascular disease and

to emphasize the importance of preconception evaluation and counseling. Women who have been asymptomatic or well-controlled on their current treatment are no exception.

"Any patient who has had cardiac surgery or diagnosed cardiac disease, including a bicuspid aortic valve, ought to be evaluated before pregnancy, even if they're feeling just fine," she says. "Many of my patients say, 'I'm just fine. There's nothing wrong with me.' While I want everybody to think that they're healthy, I also want them to be realistic. If the patient isn't being followed early on by an involved cardiologist, it lowers our ability to provide the best care."

Although most women with cardiovascular disease can go on to have healthy pregnancies, there are some conditions—such as Eisenmenger's syndrome or idiopathic pulmonary arterial hypertension—that may put the mother and baby's lives at extreme risk. These women may have to make difficult decisions about pregnancy, and early consultation with experts can save lives. "Some patients truly shouldn't be pregnant. They ought to be coming before they get pregnant so that we can fully discuss their risks and options," Dr. Adam advises.

Of course, some women may not be aware of what is relevant in their medical history—or pregnancy could reveal an undiagnosed cardiac disease. "Sometimes it's the baby, or the pregnancy, that gives us the first hint that something is wrong with the mother's health, and we work backwards toward the mother," Dr. Adam says.

One memorable patient, Mrs. X, was admitted to the hospital in her second trimester for placental insufficiency (decreased amniotic fluid, nutrients, and oxygen to the baby) and poor fetal growth. It was only when things started to go wrong with the pregnancy that she was admitted to the hospital and referred to Dr. Adam, who recognized the placental issues as cardiovascular red flags. It turned out that Mrs. X had a history of palpitations and had seen a cardiologist a few years earlier—but her tests were normal and she felt healthy, so she and her PCP never followed up on the "sort-of diagnosis." When Dr. Adam investigated further, she diagnosed an arrhythmia and an enlarged heart. Luckily, Dr. Adam's team was able to stabilize Mrs. X and delay delivery. However, because the diagnosis came so late in the pregnancy, a lot of damage had already been done, and a few weeks later, Mrs. X's baby was delivered prematurely. The infant, who weighed less than a pound, survived, and Dr. Adam sent Mrs. X to a cardiologist for treatment.

Dr. Adam encourages patients to be up-front with their physicians regarding any past cardiac symptoms or work-up that may require re-evaluation by a cardiologist. As Mrs. X discovered, the changes in female physiology during pregnancy may worsen cardiac disease that seemed stable in the past.

The pregnant woman's body changes to accommodate the increased blood volume needed to supply the uterus and fetus. Blood volume peaks at the beginning of the third trimester. Most women experience a decrease in blood pressure and an increase in heart rate. Women with cardiovascular disease are particularly sensitive to complications at the end of the first trimester, at 20 weeks, and the beginning of the third trimester. The most dangerous time during pregnancy for a woman with cardiovascular disease, however, is during labor: It is a stressful time for the heart, which is challenged by sudden increases in heart rate, increases in cardiac output, and the return of almost half a liter of blood to the maternal circulation during each contraction.[2]

In the context of these changes, pregnant women with cardiovascular disorders may need to make lifestyle adjustments, including avoiding high altitude, modifying physical activity, and staying off of airplanes in the third trimester. "Airplanes are pressurized only to 9,000 to 10,000 feet. By the third trimester, there is a 60% increase in cardiovascular strain," says Dr. Adam. This increased strain can cause fluid to back up in the lungs or trigger irregular heart rhythms, both of which are medical emergencies.

There is new, compelling evidence that pregnancy is a window into a patient's future health. Crucially, physicians need to keep pregnancy/cardiovascular complications in mind even after a woman has passed her child-bearing years. Any cardiovascular conditions or complications during pregnancy should be part of a patient's routine medical history because pregnancy-related complications can be an early warning of future disease. For example, Dr. Adam points out, "We now have very strong evidence that women who had pre-eclampsia during pregnancy have a 50% risk of developing cardiovascular disease and hypertension when they get into their early to late 40s and 50s."

With risks to both mother and baby increasing in the face of both pre-existing and new-onset cardiovascular disease, preconception counseling is critical. Patients and physicians need to be aware of the unique challenges presented by pregnancy in women with cardiovascular disease. Once pregnancy is confirmed, careful and detailed follow-up with a team of specialists is of utmost importance. Patients should be regularly screened for changes in clinical status and monitored closely with a low threshold for more detailed testing.

"If I could make every birth go according to plan, I would just

watch in the background and say, 'This was fun, we didn't have to worry.' But realistically, we have to be a step ahead," says Dr. Adam. "My goal will always be to see mom leaving the hospital after delivery with a healthy baby in her arms. But that's not true for everyone. It's not true for many cardiac patients. We won't achieve this goal in every cardiac patient, but that's what we should strive for."

Conflict of Interest Disclosure:
The author reports no conflict of interests.

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