Cardiovascular disease (CVD) is the leading cause of death during pregnancy, accounting for ≈33% of the maternal deaths in the United States.¹ There is also increasing evidence that there is a significant link between complications of pregnancy and CVD later in life. Pregnancy complications such as preeclampsia, gestational diabetes mellitus, gestational hypertension, preterm delivery, and delivery of an infant with growth restriction provide signals about the mother's cardiovascular adaptability of physiological stress. It is time to change the paradigm for identifying and preventing CVD in women.

Despite advances in medical technology and knowledge, maternal mortality during pregnancy has continued to increase over the past 3 decades. According to the Centers for Disease Control, maternal deaths per 100 000 live births have increased from 7.2% in 1987 to 17.3% in 2013. Up to a quarter of these deaths were thought to be preventable. Data from the California Pregnancy Associated Mortality Review reported many women did not know that they had cardiovascular issues prior to pregnancy and, although many of them presented with cardiac symptoms during pregnancy or in the immediate postpartum period, the diagnosis of CVD was often delayed or ignored.² Many of the cardiovascular complications during pregnancy were the result of acquired conditions. The adult survivors of congenital heart disease are another rapidly growing, high-risk population. Cribbs et al surveyed 110 pediatric cardiologists who managed patients with congenital heart disease. Even among this highly specialized group of physicians, there was confusion regarding where to refer pregnant women for care. Greater than one third of these providers reported an inadequate level of comfort to provide care for this population.³ Indeed, few cardiologists and obstetricians are familiar with the recent American Heart Association Scientific Statement on the management of pregnancy in patients with complex congenital heart disease.⁴

Currently, in the United States, most cardiologists are not specifically trained to care for pregnant women with CVD. Knowledge of the hemodynamic changes in the antepartum, intrapartum, and postpartum periods and their effect on the cardiovascular system are often not considered when treating these patients. Medical management can be compromised as providers are concerned about the effect of medications on the fetus. As a consequence, the patient who is pregnant may not receive the same standard of care as their nonpregnant counterpart. There is also increasing evidence that there is a significant link between complications of pregnancy and CVD later in life. Complications such as preeclampsia, gestational diabetes mellitus, gestational hypertension, preterm delivery, and delivery of an infant with growth restriction provide signals about the mother’s cardiovascular adaptability of physiological stress. While the American Heart Association has declared that preeclampsia in pregnancy should be considered a cardiovascular

ON MY MIND

Cardiovascular Complications in Pregnancy
It Is Time for Action

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stress test and that follow up is recommended, there has been little to no education for patients or providers regarding this issue. In 2014, the Women’s Heart Alliance surveyed 100 primary care providers and 100 cardiologists. CVD was considered a top concern by only 39% of primary care providers. Only 22% of primary care providers felt well prepared to assess cardiovascular risk factors in women. Cardiologists did not fare much better; only 42% felt well prepared to address these risk factors. Few of the physicians surveyed had implemented comprehensive guidelines.

Since most women of reproductive age use their obstetrician-gynecologist as their primary care provider, these physicians are uniquely positioned to identify and refer patients early for management of hypertension, diabetes, and dyslipidemia in order to prevent CVD and stroke. Data suggest that the percentage of women who seek postpartum follow up at 6 to 8 weeks after delivery ranges from 30% to 80% depending on patient demographic. Therefore, immediate referral at the time of postpartum visit may facilitate early identification of women with increased risk for cardiovascular complications later in life.

There has been very little attention paid to obtaining a history of pregnancy complications such as hypertension or preeclampsia. This is a missed opportunity that could allow us to develop testing and prevention strategies targeted toward women at highest risk for CVD. When women present for postpartum follow up, physicians are trained to concentrate on breast-feeding, contraception, and other immediate issues. It is clear that in order to address cardiac risk factors that can lead to long-term health issues, widespread changes need to be implemented and new guidelines for women need to be considered. We would like to propose 3 important changes to our current mode of health delivery in order to establish a collaborative disease model to provide early intervention for women at risk for cardiovascular complications:

1. Pregnancy should not be considered an isolated life event, but as part of a continuum. Complications encountered during pregnancy should have adequate follow up. Postpartum health coverage should be extended beyond 6 to 8 weeks after delivery in order to identify and treat women at risk for CVD.

2. Primary care providers/internists should be trained to obtain a complete medical history, including an obstetric history. Obstetrician-gynecologists should also be trained to identify patients with cardiovascular risk factors. Cardiologists should be trained to treat women at high risk for CVD due to pregnancy-related complications, as well as, those women with established CVD. Therefore, we must identify bio-markers that predict the women who are at highest risk for CVD with a special emphasis on ethnic inclusion. In particular, we need to design clinical trials that include women with a history of pregnancy complications, such as preeclampsia, in order to determine the best methods for preventive interventions.

3. Health care silos are no longer acceptable. We need to form multidisciplinary teams that can address cardiovascular needs during pregnancy with an emphasis on disparities in care. We need to establish joint educational and research opportunities that include general obstetricians, primary care providers, internists, maternal fetal medicine specialists, cardiologists, obstetric anesthesiologists, and critical care specialists in order to meet the unique needs of this population.

If our goal is to reduce risk of CVD, it is clear that the period around child-bearing offers a unique entry point for the care of women. Because it appears that diseases in pregnancy provide important information regarding a woman’s cardiovascular adaptability, then preventive efforts must start in this population. If we are to prevent CVD in women, then early evaluation and treatment of pregnancy complications provides an important window to implement preventive efforts which may delay or even alleviate cardiovascular complications in women.

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Disclosures
None.

REFERENCES