hospitalist models would lead to improved outcomes and lessen the "weekend effect," although this has not uniformly been demonstrated (Am J Obstet Gynecol 2015;213:587.e1–587.e13). Continued study of this issue is important; only by identifying the factors underlying these differences and how they impact outcomes can we develop means to safeguard mothers and infants. Although there will always be some unpredictability in obstetrics, it may be that trends toward more inductions and planned deliveries turn out to be a benefit in decreasing the variation in volume and acuity on labor and delivery units over time.—MEN)

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**Lifestyle in Progression From Hypertensive Disorders of Pregnancy to Chronic Hypertension in Nurses’ Health Study II: Observational Cohort Study**

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**ABSTRACT**

Hypertensive disorders of pregnancy (HDPs: preeclampsia and gestational hypertension) are associated with earlier onset of chronic hypertension and a higher risk of ischemic heart disease and stroke and affect between 5% and 10% of parous women. There is little guidance for the prevention of chronic hypertension among women with a history of HDPs, and the role of lifestyle in the progression from HDPs to chronic hypertension is unclear, including whether established lifestyle interventions are as effective in women with a history of HDPs as in the general population. The authors undertook the present observational cohort study to investigate the association of four established lifestyle risk factors for high blood pressure (body mass index [BMI], physical activity, adherence to the Dietary Approaches to Stop Hypertension [DASH] diet, and dietary sodium/potassium intake) with the development of chronic hypertension by history of HDPs. Then, the authors examined the extent to which each lifestyle factor modified the progression from HDPs to chronic hypertension.

The study cohort was composed of 54,588 parous women aged 32 to 59 years with complete reproductive history and no previous chronic hypertension, stroke, or myocardial infarction, from the Nurses' Health Study II, which sent questionnaires to recruits every other year. In the present study, history of HDPs was defined as occurring after the first of any pregnancy lasting at least 20 weeks that the nurse participants self-reported to have been complicated by a diagnosis of gestational hypertension or pre-eclampsia. At the start of the Nurses' Health Study II in 1989, women retrospectively recalled their weight at age 18 years and reported their current weight and subsequently recorded their current weight at each biennial questionnaire. Total leisure time activity per week was the basis of physical activity and was updated every 4 to 6 years. A food frequency questionnaire was used to report diet, and diet was reevaluated every other questionnaire cycle. An energy-adjusted DASH diet score was derived based on adherence to the DASH guidelines.

Hazard ratios and 95% confidence intervals for the association between each lifestyle factor and chronic hypertension by history of HDPs were estimated using multivariable Cox proportional hazards models, stratified by questionnaire cycle and age. Associations were modeled separately in 3 age categories (32–39, 40–29, and 50–59 years) in order to correctly estimate effect modification by lifestyle from the Cox models.

At study entry, 10% of women (n = 5520) had a history of HDPs in any pregnancy.
In all, 13,971 cases of hypertension occurred during 689,988 person-years of follow-up. A higher cumulative incidence of chronic hypertension was observed for women with previous HDPs and low normal weight (BMI 18.5–22.4 kg/m²) than for women without HDPs of the same weight, but that incidence was less than that of women with obesity class I (BMI 30.0–34.9 kg/m²) without a history of HDPs. Basic cumulative incidence of chronic hypertension seemed to be higher in women with a history of HDPs than in women without HDPs for the lifestyle factors other than BMI, regardless of lifestyle. The study results indicate that BMI in the years after pregnancy modifies the association between previous HDPs and risk of chronic hypertension in women. No clear evidence was found of effect modification by physical activity, DASH diet, or sodium/potassium intake on either the additive or multiplicative scale.

Overall, the present study found an association between overweight and obesity and increased risk of chronic hypertension in women with and without a history of hypertensive pregnancy. Women with both overweight/obesity and history of HDPs had higher than expected risk of chronic hypertension, given the risks observed with these risk factors were considered separately. These observations provide evidence for targeted clinical screening and interventions in these women, to potentially reduce the risk of chronic hypertension. The authors suggest that effective clinical interventions to facilitate a healthy lifestyle and weight postpregnancy are necessary to help reduce cardiometabolic risk in women with a history of HDPs and that clinicians should especially help women with a history of HDPs or gestational diabetes mellitus (GDM) mellitus to attain and maintain a healthy weight after pregnancy.

EDITORIAL COMMENT

(There is increasing interest in pregnancy as a window for future health. Fundamentally, this concept got its start with the identification of GDM with the demonstration that women with GDM have a dramatically increased risk of full-blown type 2 diabetes 10 years after pregnancy (JAMA 1982;248:949–952). Clearly, in regard to the risk of type 2 diabetes in women with GDM, it is important to realize that both conditions are increased with maternal obesity. Thus, potential interventions in women with GDM generally focus on lifestyle modification of maintaining the dietary approaches from pregnancy, maintaining exercise recommendations of five 30-minute active sessions per week and ongoing screening (Diabetes Care 2017;40: S114–S119).

Other recent findings in this area include long-term follow-up of women with preeclampsia or broadly, HDPs. In a number of studies, it seems that women with HDPs are at increased risk of cardiometabolic disease (Hypertension. 2017;70:798–803). The specific causal pathway between these observations needs greater elucidation.

In the current study abstracted above, the authors conducted a large retrospective cohort study that examined nearly 55,000 women from the Nurses’ Health Study II. They compared approximately 5500 women who had HDPs to those who did not and examined the primary outcome of developing chronic hypertension years after pregnancy. The incidence of chronic hypertension in women with previous HDPs and low normal weight (BMI 18.5–22.4 kg/m²) was greater than that in women without HDPs of the same weight. However, the rates of chronic hypertension were even higher in women with obesity regardless of previous HDPs status.

I think this study provides 2 separate, interesting findings. First, among normal-weight women, a diagnosis of HDPs is predictive of a difference in long-term outcomes, particularly of developing chronic hypertension. In terms of causality, does developing HDPs reflect an underlying pathophysiology that will lead to chronic hypertension, or does an HDP diagnosis simply point toward a group of women who were underdiagnosed with chronic hypertension in the early part of pregnancy?

In addition, in this study, the authors examined the chances of developing chronic hypertension in the setting of 3 additional lifestyle characteristics, high physical activity, adherence to a DASH diet, and a high sodium diet. In the case of the first two, they both reduced the risk of progressing to chronic hypertension, whereas a high-sodium diet increased the risk. This underscores the importance of diet and exercise in improving the long-term health outcomes.

The other important finding is that while HDPs increased chronic hypertension, it was not nearly as impactful as obesity and that in obese women HDPs did not further increase the risk of chronic hypertension. We are in the midst of a US and truly worldwide obesity epidemic, yet our ability to intervene on this epidemic at a public health level is in its infancy. Similarly, preventing or treating obesity is not done very consistently or effective.
by medical providers. It is going to be the efforts of large engagement programs that bridge between individuals and populations that may begin to turn this tide, but at present, we have little to show. The most impactful treatment for morbid obesity is bariatric surgery, an expensive, aggressive intervention with known acute and chronic complications (JAMA 2017;317:635–636). We must be able to do better, and while additional medical interventions are sought, public policy attempts to enhance behavior change are important. The work by efforts in urban planning, public health, housing, and education can all work hard to focus on changing incentives to provide environmental change that facilitates individual behavioral change to begin to turn the tide on the obesity epidemic.—ABC

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**Opioid Use in Pregnancy, Neonatal Abstinence Syndrome, and Childhood Outcomes: Executive Summary of a Joint Workshop by the Eunice Kennedy Shriver National Institute of Child Health and Human Development, American College of Obstetricians and Gynecologists, American Academy of Pediatrics, Society for Maternal-Fetal Medicine, Centers for Disease Control and Prevention, and the March of Dimes Foundation**

_Uma M. Reddy, Jonathan M. Davis, Zhaoxia Ren, and Michael F. Greene, for the Opioid Use in Pregnancy, Neonatal Abstinence Syndrome, and Childhood Outcomes Workshop Invited Speakers_

Eunice Kennedy Shriver National Institute of Child Health and Human Development, Bethesda, MD; Tufts University School of Medicine; and Massachusetts General Hospital and Harvard Medical School, Boston, MA

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**ABSTRACT**

This article provides a summary of the “Opioid Use in Pregnancy, Neonatal Abstinence Syndrome, and Childhood Outcomes” workshop convened by the Eunice Kennedy Shriver National Institute of Child Health and Human Development on April 4 and 5, 2016, and cosponsored by the American College of Obstetricians and Gynecologists (ACOG), the American Academy of Pediatrics, the Society for Maternal-Fetal Medicine, the Centers for Disease Control and Prevention, and the March of Dimes. Expert speakers from diverse fields and workshop participants identified scientific opportunities to advance the understanding of opioid use disorders in pregnancy and to improve outcomes for affected women, their children, and their families.

Research gaps and opportunities identified at the April 2016 workshop include basic science surrounding opioid use disorder, prenatal screening for opioid use disorder, obstetrics and gynecology prenatal care, medication-assisted treatment