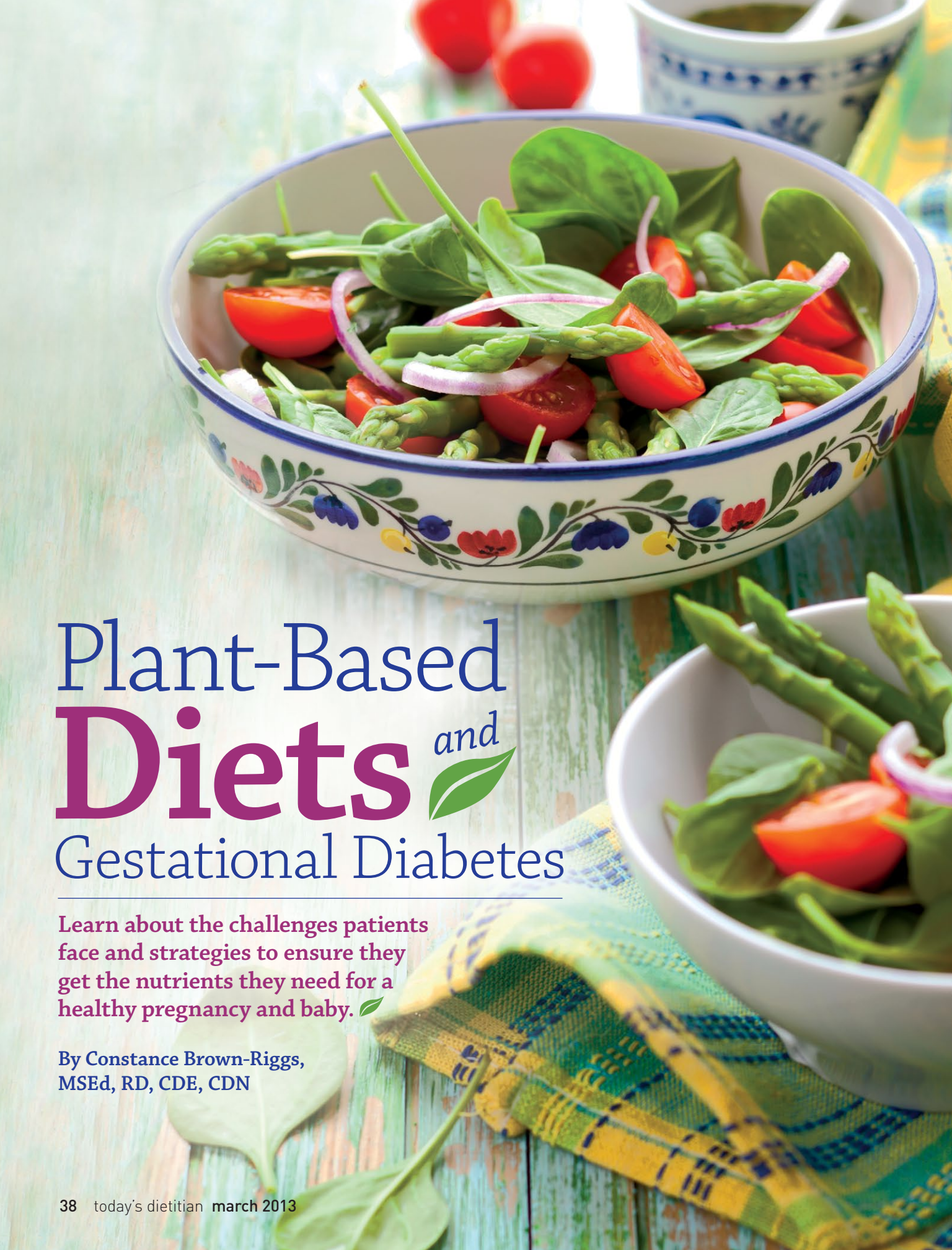

Plant-Based Diets and Gestational Diabetes

Learn about the challenges patients face and strategies to ensure they get the nutrients they need for a healthy pregnancy and baby.

By Constance Brown-Riggs, MSEd, RD, CDE, CDN

Eight months before Paula became pregnant, she decided to become a vegetarian. She was 70 lbs overweight and believed that cutting out red meat, poultry, and fish, and eating only plant-based foods would help her lose weight and obtain better health.

When Paula was diagnosed with gestational diabetes mellitus (GDM) in her 26th week of pregnancy, she continued eating a vegetarian diet to increase her chances of having a healthy pregnancy and baby.

Emerging research continues to show the benefits of plant-based diets in the prevention and management of chronic disease. The Academy of Nutrition and Dietetics (the Academy) and other healthcare organizations state that a plant-based diet, including a well-planned vegetarian diet, is appropriate for individuals during all stages of the life cycle, including pregnancy.

Studies indicate vegetarians have lower LDL cholesterol levels and blood pressure, and decreased rates of hypertension and type 2 diabetes than nonvegetarians.[1] Plant-based diets tend to be higher in whole grains, legumes, nuts, fruits, and vegetables[1]—foods that are rich in dietary fiber, magnesium, potassium, vitamins C and E, folate, carotenoids, flavonoids, and other phytochemicals associated with low disease risk.

However, when pregnant women, especially those diagnosed with GDM, eat a strictly plant-based diet they face the risk of developing nutrient deficiencies that may hinder their chances of sustaining a healthy pregnancy and delivering a healthy baby.

What Is Gestational Diabetes?

GDM is a carbohydrate intolerance that begins or is first recognized during pregnancy. The condition is characterized by hyperglycemia and associated with a host of complications to the fetus and newborn, including macrosomia, birth trauma, hyperbilirubinemia, hypoglycemia, respiratory distress syndrome, and childhood obesity.[2] The children of women with GDM also have higher rates of prediabetes and type 2 diabetes compared with children of mothers who don't have GDM.[3]

Hyperglycemia during pregnancy also can affect the mother, predisposing her to preeclampsia, Cesarean delivery, and an increased risk of developing type 2 diabetes later in life.[2]

The incidence of GDM is on the rise in the United States, and it currently affects approximately 7% of all pregnancies.[2] Fueled by the ongoing obesity epidemic along with new diagnostic criteria, experts anticipate the number to increase to 18%.[3] As a result, dietitians can expect to counsel more women with GDM.

According to the American Diabetes Association (ADA), the ongoing obesity epidemic has led to more type 2 diabetes diagnoses in general and an increase in the number of pregnant women with undiagnosed type 2 diabetes. Because of this, the ADA recommends screening women who have risk factors for the disease at their initial prenatal visit using standard diagnostic criteria.

Based on the 2008 Hyperglycemia and Adverse Pregnancy Outcome study, the ADA added diagnostic criteria for GDM to the 2012 Standards of Diabetes in Medical Care. The new guidelines suggest that all women not known to previously have diabetes undergo a 75-g oral glucose tolerance test at 24 to 28 weeks gestation. Under the new guidelines, more diagnoses of GDM are expected because only one abnormal value is sufficient to make a diagnosis.[4] Doctors make a GDM diagnosis if a patient exceeds any of the following plasma glucose measures: Fasting: 92 mg/dL or greater; 1 hour: 180 mg/dL or greater; or 2 hours: 153 mg/dL or greater.[4]

Dietitians' Challenges

Since a plant-based diet doesn't include meat, fowl, or seafood, or products containing those foods, one challenge for dietitians working with vegetarian GDM patients involves developing nutrition plans that address the diverse types and eating patterns of a vegetarian.

The lacto-ovo vegetarian diet focuses on grains, vegetables, fruits, legumes, seeds, nuts, dairy products, and eggs. The lacto-vegetarian excludes eggs as well as meat, fish, and fowl. The vegan diet—sometimes described as the total vegetarian—excludes eggs, dairy, and all other animal products. But that's not all: Some vegetarians eat fish and refer to themselves as pescatarians; others consume a mostly plant-based diet and call themselves flexitarians; and then there are 22.8 million Americans who say they follow a vegetarian-inclined diet.[5]

Research on the nutrient intake of pregnant vegetarians is limited. However, studies show pregnant vegetarians in general get less vitamin B_{12} and C, calcium, and zinc than their nonvegetarian counterparts. The Dietary Reference Intake (DRI) for all pregnant women aged 18 and older is 2.6 mcg of

LACTO-VEGETARIAN MEAL PLAN

This exchange-based menu was developed based on an intake of 180 g of carbohydrate, consisting of eight servings from the starch group, two servings from the fruit group, and two servings of nonfat dairy:

Breakfast: 1 slice whole wheat toast with 2 T of almond butter (15 g carbohydrate)

Snack: 12 to 14 grapes with 1 oz cheese (15 g carbohydrate)

Lunch: 1 cheese quesadilla or 1 sandwich with baked tofu, mixed green salad with nuts, low-fat dressing, 1 cup nonfat yogurt (45 g carbohydrate)

Snack: 1 small apple, roasted soy nuts, and 1 oz of pretzels (30 g carbohydrate)

Dinner: ½ cup vegetarian chili, ½ tempeh wrap, and vegetable wrap (45 g carbohydrate)

Snack: 8 oz nonfat milk and five whole wheat crackers with 1 oz cheese (30 g carbohydrate)

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vitamin B_{12}, 80 mg of vitamin C, 1,000 mg of calcium, and 11 mg of zinc daily. If their dietary intake doesn't meet the DRI, dietitians should recommend a vitamin and mineral supplement to prevent deficiencies.[6]

Evidence-based analyses of available studies also indicate that pregnant vegetarians eat less protein and higher levels of carbohydrate than pregnant nonvegetarians. The Institute of Medicine recommends 175 g of carbohydrate per day during pregnancy.[3] During the last trimester, pregnant women require additional carbohydrates to ensure adequate glucose for the developing fetal brain. Eating a diet high in carbohydrates, however, is especially problematic for pregnant GDM patients who need to control blood glucose levels.

Medical Nutrition Therapy

Medical nutrition therapy (MNT) with an emphasis on controlling carbohydrate intake in GDM patients is considered first-line therapy and often the only therapy that will normalize blood glucose levels in women with GDM.[3] Because vegetarian diets emphasize fruits, vegetables, beans, and whole grains, they're inherently high in carbohydrates. Most vegetarians believe they can eat plenty of corn, peas, potatoes, and yams,[7] but these are starchy vegetables and must be eaten in moderation. In GDM meal planning, these starches count as one carbohydrate and one protein serving, providing 15 g of carbohydrate and 7 g of protein.

Gaining glycemic control quickly is essential to preventing complications associated with GDM, so it's important for dietitians to carefully counsel mothers and develop meal plans that fit their unique lifestyles. RDs also must consider that the first meal of the day is physiologically the meal that GDM patients show the greatest insulin resistance. As a result, dietitians will need to limit these patients' carbohydrate intake to no more than 30 g at breakfast. In addition, they'll need to space carbohydrate intake throughout the day among three small- to moderate-size meals and two to four snacks. The Academy suggests GDM patients get 15 to 30 g of carbohydrate for breakfast, 45 to 60 g for lunch and dinner, and 15 to 30 g for snacks.

To ensure GDM patients eat healthfully to help control blood sugar and get the nutrients they need, leading health authorities suggest they receive nutrition counseling from an RD at the time of diagnosis.[4] The Academy recommends MNT be initiated within one week of a GDM diagnosis, with a minimum of three nutrition counseling visits. Research studies show implementing this recommendation decreases hospital admissions and insulin use, improves the likelihood of normal fetal and placental growth, and reduces risk of perinatal complications.[8]

Self-Monitoring of Blood Glucose

Dietitians also should advise pregnant women with GDM to self-monitor fasting and postprandial blood glucose levels. Several studies report a correlation between elevated fasting and postprandial blood glucose values with poor maternal and neonatal outcomes.

RDs should review the self-monitoring of blood glucose, record and use the results to evaluate the effectiveness of nutrition intervention and lifestyle modifications, and the need for possible pharmacological therapy. The ADA recommends GDM patients meet the following glucose goals: preprandial: 95 mg/dL or lower; 1-hour postprandial: 140 mg/dL or lower; and 2-hour postprandial: 120 mg/dL or lower.[1]

Regular Exercise

Physical activity is another effective means of controlling blood sugar. Unless contraindicated, dietitians should recommend 30 minutes of physical activity for a minimum of three days per week. Research indicates regular exercise during pregnancy reduces the common discomforts of pregnancy without a negative effect on maternal or neonatal outcomes and improves glycemic control in those with GDM.[9]

Medication

If patients can't control their blood sugar with MNT and regular physical activity, their physician may need to prescribe medications. Research indicates pharmacological therapy improves glycemic control and reduces the incidence of poor maternal and fetal outcomes.[10]

Traditionally, women who have been unable to achieve and maintain normal blood glucose levels with MNT alone have been prescribed insulin. However, recently doctors have been prescribing glyburide and metformin to GDM patients, although the FDA hasn't approved either of these medications to treat gestational diabetes. Glyburide is the only antiglycemic medication that's been well studied in pregnant women. According to the Academy's Evidence Analysis Library, eight studies reported that glyburide was effective in maintaining glycemic control with MNT.

VEGAN MEAL PLAN

This menu was developed based on an intake of 195 g of carbohydrate, including nine servings from the starch group, two servings from the fruit group, and two servings of meat substitutes.

Breakfast: ¼ cup of granola, 6 oz plain soy yogurt (15 g carbohydrate)

Snack: ½ whole wheat pita bread with 2 T hummus (30 g carbohydrate)

Lunch: 1 soy burger on a whole wheat bun, 8 oz fortified flavored soy milk, green salad with low-fat dressing (45 g carbohydrate)

Snack: 1 small fruit with 2 T peanut butter, 1 cup flavored soy yogurt (30 g carbohydrate)

Dinner: 1 cup quinoa, stir-fried tofu with mixed vegetables (45 g carbohydrate)

Snack: Five whole wheat crackers with tahini, 1 fruit (30 g carbohydrate)

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RECOMMENDATIONS FOR GDM PATIENTS

The Academy of Nutrition and Dietetics (the Academy) has developed the following nutrition intervention recommendations for gestational diabetes mellitus (GDM) patients as part of its evidence-based nutrition practice guidelines:

• Weight loss during pregnancy isn't recommended. Research indicates that low or inadequate weight gain during pregnancy is associated with an increased risk of preterm delivery, regardless of prepregnancy BMI levels. However, a modest energy restriction—approximately 70% of the Dietary Reference Intake (DRI) for pregnant women—will promote a slowing of maternal weight gain. A minimum of 1,700 to 1,800 kcal/day should be obtained to prevent maternal or fetal compromise or ketonuria.

Sarah Krieger, MPH RD, LD/N, a facilitator of the Fit4AllMoms study in which one of three participants has GDM, notes that study participants are provided 1,800 to 2,200 kcal/day based on BMI. "We look at the whole picture, how much total weight gain there is and know that appetite fluctuates," Krieger says. "Most ladies do well with eating balanced meals including protein, checking serum glucose, and walking daily."

• Based on the DRI, a minimum of 175 g of carbohydrate per day is encouraged to provide adequate glucose for fetal brain development and prevent ketosis. Total carbohydrate intake should be less than 45% of total calories to prevent hyperglycemia. Elevated postprandial blood glucose levels are associated with large-for-gestational-age infants and increased rates of C-sections.

• Protein and fat should be calculated to provide 10% to 35% and 20% to 35% of the DRI for energy, respectively. The Recommended Dietary Allowance for pregnancy is 1.1 g/kg of protein per day, or an additional 25 g of protein per day.

• If women with GDM choose to use products containing nonnutritive sweeteners, dietitians should inform these women that they should consume only FDA-approved nonnutritive sweeteners and suggest they use them in moderation. Aspartame, acesulfame potassium, sucralose, saccharin, and neotame are FDA approved for general use.

— CBR

Counseling Considerations

While advances in medicine have improved the treatment of GDM, no one wants such a diagnosis. And although it may be for only a matter of months, making lifestyle changes during pregnancy can be stressful. Compounding the problem is the increase of hormones that work against insulin and can cause blood glucose levels to rise.

Mothers may feel guilty and embarrassed if they're overweight and know their eating habits are less than ideal. Sarah Krieger, MPH, RD, LD/N, an Academy spokesperson and a facilitator for the Fit4AllMoms Study at All Children's Hospital in St Petersburg, Florida, accentuates the positive with her patients and tells them this is a perfect time to begin a healthful lifestyle, increase physical activity, and avoid gaining too much weight.

Others may be fearful of the prospect of injecting insulin and may withhold or manipulate data in their self-monitoring of blood glucose log or reduce food intake to control hyperglycemia. Some women may become angry about having to change their lifestyle and begin paying attention to food intake, carbohydrate counting, blood glucose monitoring, and insulin injections, if required.

Dietitians should acknowledge that GDM can be overwhelming. "I justify that first," Krieger says. Emotional support and education on GDM will ease women's fears and can serve as a source of motivation. "When they understand they don't want a large baby or C-section, moms are motivated to follow through by following recommendations," she says.

Krieger advises dietitians to develop a good working relationship with each patient's doctor and understand what he or she is telling the patient. "I work in a practice with six different doctors, and they all don't tell the patients the same thing," she adds.

Optimistic Outlook

As mentioned, research supports that a well-planned plant-based diet is appropriate during all stages of life, including pregnancy. However, the inherently high carbohydrate content of a vegetarian meal plan coupled with the emotional stress of GDM can be challenging to both the mom-to-be and the dietitian. By educating patients about GDM and walking them through the process of choosing nutritious foods and taking the proper prenatal supplements to meet nutrient requirements, pregnant women with GDM can expect to have a healthy pregnancy and baby.

— Constance Brown-Riggs, MSEd, RD, CDE, CDN, is the national spokesperson for the Academy of Nutrition and Dietetics, specializing in African American Nutrition, and author of the *African American Guide to Living Well With Diabetes* and *Eating Soulfully and Healthfully With Diabetes*.

For references, view this article on our website at www.TodaysDietitian.com.