“Optimal Nutrition for Improved Twin Pregnancy Outcome”
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1. I agree that a consultation with a registered dietician/nutritionist is essential for aiding a pregnant mother with twins with managing her diet and supplements. Unfortunately, insurance companies often will not cover this service. How do you overcome this barrier to this service? Is your solution practical for a general Ob/Gyn office?

Response from Drs. William Goodnight and Roger Newman:

As nutrition counseling is important in twin gestations, providers who care for twins and other multiple gestations should incorporate this aspect into the routine prenatal care. The benefits of nutrition consultation and attention to nutrition in multiple pregnancies has been well suggested by the Michigan Multiple Clinic experience as well as others, and is a benefit that has been associated with dedicated multidisciplinary “twin prenatal care clinics.” At the Medical University of South Carolina (MUSC), this entails a dedicated ½ day with onsite nutritionist and establishment of multiple gestation ‘best practice’ clinic guidelines, in a clinic in which more than 90% of the patients are carrying multiple gestations.
Fortunately, many insurance companies will reimburse for nutrition consultation with certified dietitians, termed Medical Nutrition Therapy. Medicaid provides coverage during pregnancy when pregnancy is “threatened” by a nutritionally-related disorder, as which anemia, poor weight gain, maternal obesity, diabetes, and multiple gestation all qualify. Many private insurance companies (here at the University of North Carolina [UNC] we are most familiar with Aetna and Blue Cross), similarly will provide nutrition consultation and management in the presence of other nutritionally related complications including anemia (hemoglobin less than 10g/dL), obesity, or diabetes. While routine referral of all twin pregnancies may not have insurance coverage, certainly those with most significant nutritionally related complications can find some insurance compensation for establishment of a plan of care. Finally, the American College of Obstetricians and Gynecologists (ACOG) indicates in its Guidelines for Prenatal Care that nutrition consultation is recommended for twin gestations.

Finally, how to incorporate this into a typical Ob/Gyn practice? Management of multiple gestations requires a commitment on the part of the caregiver. Establishment of written “best practice” guidelines for your practice, including supplement brands and dosing by gestational age, weight gain goal graphs for each body mass index (BMI) group, and gestational age specific lab evaluations that can be included in the charts of multiple pregnancies can provide triggers for the provider to make nutrition part of their continuing patient assessment as well as track the patient’s progress over the pregnancy. Prepared patient handouts such as tips for gaining weight, slowing weight gain, and micronutrient rich food sources can be created to distribute when such risk factors are identified. Educating a care provider such as an office nurse or midwife about prenatal care of twins, including twin specific nutrition, can expand the provider’s available time and allow him or her to answer more in-depth questions related to nutritional care of the multiple gestation. Including the patient in the evaluation, as simply as showing her the weight gain graph at each visit, will provide reinforcement into the importance of attention to nutrition in multiples. Finally, coordination of twin pregnancy care with a maternal fetal medicine consultation for periodic updates in nutrition, fetal testing, assessment
of fetal growth, and risk of preterm birth may also allow more nutrition consultation opportunities.

2. Normal-weight mothers with twins are often stunned to learn that they need to consume 3,000–4,000 calories per day. How do you persuade a woman to consume this many calories per day if she is anxious about postpartum weight retention and disturbed by the postpartum weight data in citation 26 (Luke B, Hediger ML, Min L, Nugent C, Newman RB, Hankins GD, Grainger. The effect of weight gain by 20 weeks’ gestation on twin birthweight and maternal postpartum weight. Am J Obstet Gynecol 2006;195(6):S85)?

Response from Drs. William Goodnight and Roger Newman:

More than focus on calorie intake, it should be emphasized that establishment of appropriate and early weight gain has been associated with clear improvement in pregnancy outcomes. In twin pregnancy achievement of BMI specific weight gain goals, especially by 20-28 weeks gestational age, has been associated with increases in birth weight and length of gestation. Achievement of maternal weight gain above the body mass index (BMI)-specific goals by Luke, et al is not associated with further improvements in birth weight. The caloric intake recommendations are a set of guidelines especially for early pregnancy. As the pregnancy progresses, with appropriate tracking of maternal weight, changes in the caloric intake (either more or less) are possible, with the focus more on appropriate weight gain rather than total calorie intake.

There is a paucity of data in twins as to the risk of post partum weight retention using these weight gain goal criteria. Excessive weight gain in pregnancy is associated with an increased lifetime risk of obesity. Luke’s data for maternal weight retention at the post partum visit demonstrated that those with weight gains within the BMI-specific goals by 20 weeks demonstrated an approximate 10 pound difference at the post partum visit between the mean
postpartum weights. Data at 6 months and one year are not available. Unfortunately, these data did not describe the achievement of weight gain goals at delivery and weight retention. There is evidence that early pregnancy weight gain may be mobilized later in pregnancy, thus suggesting that optimally nourished women are then left with less post partum weight retention. The most recent Institute of Medicine recommendations for weight gain in pregnancy critically evaluated the potential for post partum weight retention when establishing the current guidelines, and support weight gain goals similar to those of Luke, et al.

Thus, based on available data and the increased risk of low birth weight in twins, the goal should be to gain weight throughout the pregnancy, within the BMI-specific weight gain goals. Serial assessment is recommended, with specific attention to both achievement of the weight gain goals as well as prevention of excessive weight gain. We counsel our patients that we will track the weight gain at each visit and alter caloric intake and diet composition to prevent excess weight gain as well as to achieve BMI-specific goals. Based on the current evidence this approach strives to achieve the goal of optimal birthweight outcomes while reducing the risk of excessive maternal weight retention.

References:

3. Nausea and vomiting are common early in a twin pregnancy; however, the authors note that poor weight gain early in pregnancy is associated with poor intrauterine growth and early delivery. Further, adding multiple supplements to the diet often exacerbates nausea and vomiting. How do the authors manage nausea and vomiting early in pregnancy while achieving goals for weight gain and micronutrient intake?

Response from Drs. William Goodnight and Roger Newman:

The importance of early weight gain and micronutrient-appropriate diet in twin pregnancies argue for aggressive treatment of significant nausea and vomiting in early pregnancy. Patient specific evaluation to determine areas of micronutrient deficiency can refine the supplement guidelines when nausea reduces supplement tolerance. Additionally, first trimester multivitamin supplement is likely less beneficial, outside of a defined deficiency, thus holding supplements until the second trimester is reasonable if they are poorly tolerated. Achievement again of a balanced diet should be emphasized over supplements, thus medical or diet interventions for nausea and vomiting should employ this goal.

We recommend aggressive treatment of nausea and vomiting in twin pregnancy, which can be initiated in an outpatient setting. Medication use and diet modification away from inciting foods or smells can be useful, and frequent visits for assessment of weight gain, ketonuria, and assessment of electrolytes is often necessary. In-patient management for intractable vomiting, weight loss, or electrolyte abnormalities may be necessary. The addition of IV multivitamin, folic acid, B6, and thiamine to initial IV fluid administration is recommended. Finally, while significant early pregnancy weight loss increases the risk for slow fetal weight gain, the mother should be reassured that later maternal ‘catch up’ weight gain between 20 and 28 weeks may reduce these risks.
4. Is it practical to expect that the recommended micronutrient intake can be achieved solely through diet sources? If not, how should each of the supplements be taken? Can they be taken all together at the same time? Can they be taken with meals?

Response from Drs. William Goodnight and Roger Newman:

The first goal of proper nutritional intervention is achievement of a well balanced diet to incorporate the necessary macro and micronutrients. With appropriate balance in the diet and appropriate caloric intake, an ideal diet for women without other medical complications, should be able to provide near-adequate micronutrient intake. The fact that micronutrient supplementation in low risk women has had little impact on prevention of certain pregnancy complications, supports the idea that micronutrient supplementation is most effective in a deficient population. That said, due to physiologic changes in twin pregnancy, it may be difficult to obtain an ideal diet and as described in the paper, twin pregnancy is at increased risk for micronutrient deficiency, making supplementation necessary in most twin pregnancies.

When supplements are used, attention to factors that impair or improve absorption is necessary. Iron is less well absorbed with meals or caffeinated beverages, and in close timing to antacids, including H2 receptor blockers and proton pump inhibitors. However, when taken with a meal, the side effects are reduced. Iron absorption is improved if consumed with a source of vitamin C. Calcium, magnesium, zinc however can be taken with meals. Omega-3 fatty acids can be taken with meals as well. Thus, if well tolerated, a reasonable approach would be to provide calcium, magnesium, and zinc (and combination preparations are available), with each meal, prenatal vitamin and iron at bedtime, and other supplement as necessary.
5. Cost and incomplete compliance affect adequacy of intake of micronutrients, particularly when the list is long. Of all of the micronutrients recommended in a twin pregnancy, which should be given the greatest effort and importance?

Response from Drs. William Goodnight and Roger Newman:

There are two suggestions as to how to select the ‘most important’ micronutrients for twin pregnancy. First, evaluation of the mother’s diet and nutritional status at the start of pregnancy may dictate the presence of specific deficiency, and thus lead to supplement selection. Early pregnancy screening for iron deficiency with serum ferritin even in face of a normal hematocrit emphasizes the need for early iron supplementation, and often can be obtained from increasing the intake of iron rich foods. In addition diet, lifestyle, and demographic risk factors may emphasize an area of likely deficiency that can be confirmed with maternal testing or supplement. Such examples include African-American ethnicity with limited sun exposure increasing the risk for vitamin D deficiency, lactose intolerance placing a woman at risk for calcium deficiency, or a primarily vegetarian diet or diet low in fish consumption at risk for poor DHA, folate, and iron intake.

Second, data as to the effectiveness of micronutrient supplement in twin pregnancy based on RCT’s is lacking. The strongest data on improved pregnancy outcome with micronutrient supplementation includes iron supplement to prevent low birth weight and data from the Michigan Multiples Clinic in which aggressive supplementation with calcium, magnesium, zinc suggested benefit. These specific supplements may be the “most important” supplements in twin gestations or in deficient populations. In many diets, the increased requirements for calcium, magnesium, and zinc are difficult to achieve which is another reason that these supplements have been advocated as important in twin pregnancy. Thus if the recommended supplementation is difficult to achieve during twin pregnancy, a good goal is to:

1) Achieve a healthy balanced diet including adequate dietary iron intake
2) Use prenatal vitamin supplementation
3) Use specific supplements based on individual risk factors and maternal testing
4) Use calcium, magnesium, and zinc supplementation as described in our paper.

References:

6. Occasionally our patients with polycystic ovary syndrome who conceive with ovulation induction have twin pregnancies. Some of these women have class III obesity (body mass index [BMI] 40 or more). Is there a BMI over which you would recommend a patient gain minimal or no weight during her twin pregnancy? What is the ideal weight gain for a woman with class III obesity and twins?

Response from Drs. William Goodnight and Roger Newman:

Unfortunately, as the literature is not complete on ideal weight gains for twins, or even singletons, at extremes of maternal weight, the data on ideal weight gain with a maternal body mass index (BMI) over 40 is limited. The most recent World Health Organization (WHO)/Institute of Medicine recommendations for maternal weight gain in pregnancy do not separate the obese sub-classes and recommend singleton weight gain of 11-20 lbs for BMI over 30 and twin weight gains of 25-40 lbs for women with BMI over 30. Thus there currently are no recommendations for a maternal pre-pregnancy weight at which no weight gain in pregnancy is recommended. For Class III obesity in twin pregnancy, targeting maternal weight gain toward the lower end of the 25-40 pounds weight gain (ie, 15-25 lbs, half by 20 weeks of estimated gestational age [EGA]) would be reasonable, with specific attention to interventions to avoid excessive maternal weight gain.
Additionally, as women with polycystic ovary syndrome, obesity, and multiple gestations are at increased risk for gestational and pre-existing diabetes, early glucose tolerance testing (at intake to prenatal care and repeated at 24-28 weeks of EGA) should be considered. The diet recommended in the paper, a ‘diabetic-type’ diet, may also prove beneficial in reducing the risk of developing gestational diabetes and could, although untested, help reduce the adverse metabolic and inflammatory state present with obesity.

**References:**

7. How does counseling a woman using a vegan diet (no meat, milk, or eggs) differ, especially in regards to protein consumption, calcium and vitamin D?

**Response from Drs. William Goodnight and Roger Newman:**

Appropriate nutrition and maternal weight gain is certainly achievable in women with twin pregnancy consuming a vegan diet, however a strict vegan diet is associated with an increased risk of small for gestational age (SGA) babies. Challenges are found in obtaining appropriate caloric intake and some of the primary sources of certain macro and micronutrients are excluded from the diet, especially meats (iron and folic acid), dairy products (calcium and vitamin D), and fish/seafood (omega 3 fatty acids). Several approaches may be helpful. First, assessment of diet composition at the intake of the pregnancy may highlight areas of potential deficiency. Serum screening for vitamin D levels, iron (ferritin), folate, and B12 can demonstrate areas of potential deficiency. Supplementation can then be tailored to specific nutrient deficiency. Vegan dietary sources of common macro and micronutrients include:

- Protein – soy sources are equivalent to animal proteins, beans, seeds, nuts, and whole
Grains provide essential and non-essential amino acids

- Iron – dried beans, spinach, and dried fruits
- Zinc – grains, nuts, legumes
- Calcium – spinach, kale, broccoli, legumes

Micronutrients including folic acid, vitamin D, DHA, and vitamin B12 require fortified cereals, fortified soy beverages, or may require additional supplement, to achieve recommended levels in a strict vegan diet. Finally, attention to caloric intake is important as protein and vegetable sources are calorie poor, nutrient rich foods, and it may be challenging to consume the required daily calories to ensure appropriate weight gain. Finally, considering the challenges of meeting the nutritional requirements of a twin pregnancy on a strict vegan diet, it is probably worthwhile having a conversation with the patient about the benefits of going off that diet for the course of pregnancy unless there are specific medical or religious reasons why that is not possible.

**Disclaimer:**

The above discussion with Drs. Goodnight and Newman reflects the authors’ opinions based on currently available information and does not reflect or represent the views of the Society for Maternal-Fetal Medicine. Practice will reasonably vary depending on location, resources, and individual patient characteristics.