

## NUTRITIONAL MANAGEMENT OF OBESE PREGNANT WOMEN<sup>5</sup>

Obesity<sup>6</sup> is probably the most common nutritional problem in the U.S. today, and all evidence indicates that the incidence is increasing. There is no doubt that obesity constitutes a health hazard since it carries with it increased risk of such complications as diabetes mellitus, hypertension, and thromboembolic disease. It is generally agreed that obese women face increased obstetric risks. However, it is the complications associated with obesity rather than obesity itself that account for this potential risk in which both maternal and infant outcome may be compromised.

Ideally, if an obese woman is contemplating pregnancy, she should work under a physician's supervision to achieve her ideal weight before conception. In reality this rarely occurs. Unfortunately, there is a paucity of information on the nutritional management of obese obstetric patients and their management has become a matter of considerable controversy. No one would argue, however, that the primary goal of nutritional management for any prenatal patient should be the optimal growth and development of the fetus. The objective for any pregnancy outcome should be the birth of a healthy baby with the lowest risk of mortality and morbidity—pregnancies of obese pregnant women included.

The following guidelines for the nutritional management of obese prenatal pa-

tients are based on available research, clinic data, and combined judgments of several experts in the field:

1. *Marked caloric restriction is potentially harmful. Caloric intake should be adequate to support a smooth and progressive weight gain of at least 24 pounds.*

The greatest controversy in the management of the obese pregnant woman centers around caloric intake and resulting weight gain. The argument for a restricted intake is the belief that it decreases the complications of obese pregnancies. However, it has been observed that most reports indicating a



As in the case of the normal-weight pregnant woman, the weight gain of the obese pregnant woman should not be less than the amount required for the fetus and supporting tissues and fluids. (Photo: PAHO/INCAP)

<sup>5</sup> Condensed version of a paper prepared by Carol G. Corruccini, and issued by the Maternal and Child Health Branch, Community Health Services Division, California Department of Health Services, Sacramento, California, October 1977.

<sup>6</sup> Obesity is properly defined as an excess relative body fat content indicated by skinfold measurements or body composition determinations. However, obesity is often designated as body weight heavier than some appointed standards. For adults, 20 per cent above the standard weight for height in the Metropolitan Life Insurance Company tables is routinely used. An obese pregnant woman is one whose preconceptional weight satisfies this definition.

larger number of complications at delivery and a higher incidence of toxemia in obese women are often a result of limiting food intake.

Most physicians oppose actual weight loss during pregnancy. However, a few still advocate a moderate to marked caloric restriction so that the patient concludes pregnancy with a net weight loss. This appears unwise for several reasons.

Severe restriction of caloric intake results in the restriction of essential nutrients. To include needed nutrients in sufficient amounts requires a daily intake of at least 2,000 kcal. If food intake is restricted so that less than 2,000 kcal are provided, certain vitamins, minerals, and protein will not be supplied in sufficient amounts. Vitamin and mineral pills can be given, but these do not contain many known trace elements, fiber, or unknown factors. Neither do they contain protein.

Moreover, optimal protein utilization depends on a certain energy intake in order to prevent amino acid catabolism for energy needs. Unless sufficient energy is provided, the amount of protein available for fetal growth can be affected. Some researchers have shown that 36 kcal/kg pregnant body weight is needed for adequate protein utilization in normal-weight women. Based on this, the minimum energy level for an obese pregnant woman might be 36 kcal/kg *ideal* pregnant body weight. Further research and clinical experience are needed to determine if additional energy intake is indicated.

Restriction of caloric intake in pregnancy also results in infants of a lower birth weight than if energy were not limited. A California study shows that the larger the baby, up to 4,000 g, the lower the neonatal mortality rate. Infants whose birth weight at full term is less than 2,500 g (small-for-date) have a sharply increased risk of neonatal death, stillbirth, poor infant development, cerebral palsy, and mental retardation. It therefore seems reasonable that the

nutritional management of any pregnant woman should support optimal weight gain by the fetus. Although the major determinant of an infant's size is gestational age, many studies have shown a direct correlation between both prepregnancy weight and weight gain during pregnancy with birth weight. The more the mother gains, the heavier her baby will be with less chance of being small-for-date. Likewise, the more the mother weighs before she becomes pregnant, the heavier her baby will be and the lower the chance of birth weight below 2,500 g. Weight gain appears to have a somewhat greater effect on birth weight than prepregnancy weight. These two factors act independently and additively. Even in the obese patient, increasing weight gain raises the birth weight of the infant and decreases the incidence of small-for-date infants.

A further hazard of restricting weight gain through limiting intake is the possibility of ketosis. Energy restriction induces fat catabolism which in turn results in ketonemia. Compared with nonpregnant women, pregnant women seem to be particularly susceptible to acidosis with starvation, and several studies indicate that ketosis is poorly tolerated by the fetus as well. This has been well demonstrated in diabetic women; ketoacidosis presents a potentially lethal condition for the fetus. In addition, several investigators have shown that diabetic women with acetonuria had offspring with lower IQ's than nondiabetic controls, while children of diabetic mothers without acetonuria had IQ's equal to the controls. Acetonuria in nondiabetic women during pregnancy, presumably a reflection of starvation, was associated with a significant lowering of the IQ measured in their four-year-old offspring.

All in all, there appears to be no justification for limiting weight gain in the obese prenatal patient to less than the sum of the fetus and supporting tissues and fluids (placenta, amniotic fluid, uterus, mammary glands, blood, and extracellular fluid), a

total of 9,155 g or about 20 pounds. The normal pregnant woman lays down an additional 2-3.5 kg in fat stores. It is impossible to know if limiting weight gain to 20 pounds in the obese woman simply limits these fat deposits. Therefore, it seems reasonable that the obese obstetric patient should gain at least 24 pounds like the normal-weight patient. This should assure her gaining the necessary amount for the fetus and supporting tissues and fluids. Furthermore, with a 24-pound weight gain, the obese woman should be able to return to her prepregnancy weight within three to six months of delivery. Weight reduction regimens should be undertaken only in the interpartum period following lactation.

Even more important than the amount of weight gained is the rate of weight gain. Like normal-weight patients, obese women should gain their weight smoothly and progressively. Certainly all the weight should not be gained in the first and/or second trimesters with subsequent weight restriction. The Prenatal Weight Gain Grid, which is found in *Nutrition during Pregnancy and Lactation*,<sup>7</sup> is a graphic representation that can be used for monitoring the rate of gain. In addition, this grid provides an excellent educational tool to use with the patient and aids in counseling.

2. *Faulty eating habits should be corrected. A quality diet should be attained by following the Revised Daily Food Guide in Nutrition during Pregnancy and Lactation with daily supplementation of 400-800 µg folacin and 30-60 mg iron.*

Obesity does not imply an excess of nutrients. In fact, often the opposite is the case. Obese women have at some time in their lives been overnourished in calories but are frequently undernourished in essential nutrients. A large part of their intake may be derived from highly refined sugars,

fats, and alcohol, none of which provide substantial quantities of protein, vitamins, or minerals. Therefore, more obese women who become pregnant are malnourished than other women. It is important that the quality of these women's diets be improved during pregnancy. Sufficient protein, vitamins, and minerals must be provided to meet the needs of the developing fetus.

Except for iron and folacin, the nutrients necessary for pregnancy can be obtained by following the Revised Daily Food Guide in the California Department of Health's policy statement, "Food Guides." It is extremely difficult to meet the recommendations for iron and folacin by diet alone, and daily supplementation of 400-800 µg folacin and 30-60 mg iron is recommended. A complete multiple vitamin/mineral pill is warranted for those patients whose prepregnancy diets are indeed shown to be inadequate. Such supplementation can provide certain immediate benefits since it takes time to change from poor food habits to a quality diet.

In order to correct faulty eating habits, the dietary intake of the obese obstetric patient should be compared with the Revised Daily Food Guide. The Pregnancy Diet Intake in *Nutrition during Pregnancy and Lactation* is useful for this purpose. Foods belonging to the six food groups in the Revised Daily Food Guide should be substituted for any high calorie-low nutrient foods that the woman is consuming (Table 1).

3. *Whenever possible, a dietitian/nutritionist should provide frequent counseling, emphasizing the same general principles of prenatal nutrition that apply to patients of normal weight.*

Because of the time involved in managing the nutrition of obese women during pregnancy, every effort should be made to have a dietitian/nutritionist handle the nutritional component of care. A nutrition

<sup>7</sup>California Department of Health, Sacramento, California, 1975.

Table 1. Revised Daily Food Guide.

Food Group	Number of servings		
	Non-pregnant woman	Pregnant woman	Lactating woman
Protein foods			
animal <sup>a</sup> .....	2	2	2
vegetable <sup>b</sup> .....	2	2	2
Milk and milk products .....	2	4	5
Breads and cereals .....	4	4	4
Vitamin C-rich fruits and vegetables .....	1	1	1
Dark green vegetables .....	1	1	1
Other fruits and vegetables .....	1	1	1

<sup>a</sup>1 serving is 2 oz (60 g).<sup>b</sup>Should include at least 1 svq. legumes.

specialist has knowledge and experience of nutritional needs during pregnancy, food values, and food budgeting as well as the cultural, social, economic, and psychological factors that may influence dietary habits. Therefore, she or he is uniquely qualified to evaluate the nutritional status of the high-risk patient and to help the patient achieve an optimal diet.

Nutrition counseling should begin as early as possible in pregnancy for any prenatal patient. It is especially important that high-risk patients such as the obese be seen during their first prenatal visit. This allows optimal time to make any necessary dietary changes. Continuous follow-up is also essential; otherwise all efforts may be wasted. Ideally, follow-up sessions should be more frequent for obese than for normal patients. The health professional usually needs to spend more time with high-risk patients, making sure they are able to incorporate sound nutritional practices.

Before the first counseling session begins, a complete nutritional assessment must be done. The clinical forms found in the California Department of Health's manual, *Nutrition during Pregnancy and Lactation*, are useful for making this assessment. Included are dietary (nutrition question-

naire, pregnancy diet intake), anthropometric (prenatal weight gain grid), biochemical (hematologic values), and clinical examinations. For the obese woman, it is probably wise to evaluate the current diet at each subsequent counseling session in addition to the initial assessment. Weight gain for all pregnant women should also be plotted at each subsequent session. Routine hematologic values should be repeated once each trimester.

Because of the possibility of unsound food habits in the obese patient, it is important that she understand the value of a quality diet during pregnancy. This should include an explanation of nutrients needed for her developing baby. In addition, sources of these nutrients from food groups in the Revised Daily Food Guide should be discussed. Sample meal patterns and menus help show the patient how the Revised Daily Food Guide is used. Understanding the role of prenatal nutrition helps motivate the patient to change faulty dietary habits.

The obese patient should also understand the necessity of an adequate weight gain. Frequently an obese patient panics at the thought of gaining more weight. The health professional responsible for care should explain that at least 24 pounds is

necessary for a healthy pregnancy and these pounds are usually lost within 3 to 6 months after delivery. Some obese women fast or take laxatives or diuretics before weigh-ins for fear of being chided for an excess weight gain. Protein catabolism, loss of water-soluble vitamins and depleted electrolyte levels that are associated with such practices should be explained to the patient.

*4. Breast-feeding should be encouraged; supervised weight reduction should be planned as a post-lactation follow-up.*

Besides the numerous advantages breast feeding has for the infant, lactation has been shown to help the mother lose weight more quickly. Fat stores are partially used

for milk production. However, a quality diet with sufficient calories is still needed to allow for adequate growth and development of the infant. Restricted diets should only be undertaken after lactation is concluded.

Weight reduction should be instituted after lactation to bring the woman closer to her ideal weight. This should always include appropriate nutritional counseling and medical supervision. Treatment generally involves resolving the imbalance between energy intake and expenditure. A nutritionally adequate diet limited enough in calories to lose one to two pounds each week along with regular exercise should be adopted. Reeducation of the individual is extremely important. Psychological techniques such as self-help groups and behavioral modification are often helpful.

#### DR. S. PAUL EHRLICH, JR., DEPUTY DIRECTOR

Dr. S. Paul Ehrlich, Jr. has been appointed Deputy Director of the Pan American Sanitary Bureau, replacing Dr. Charles L. Williams, Jr. Dr. Ehrlich's research and epidemiologic experience, related to hospital administration and cardiovascular diseases, was carried out at the U.S. National Institutes of Health. He joined the U.S. Department of Health, Education, and Welfare, held the post of Deputy Director, and later of Director of the Office of International Health. From 1973-1977 he served as Acting U.S. Surgeon General. On the international front, Dr. Ehrlich was designated for several years as the U.S. Government's representative to the Governing Bodies of PAHO and WHO. He served as a Member of the WHO Executive Board, and was elected its Chairman in 1971.

In 1957 Dr. Ehrlich obtained the degree of Doctor of Medicine from the University of Minnesota, and in 1961, Master of Public Health from the University of California at Berkely. Two years later he completed his residency in epidemiology at the latter institution. He has been adjunct professor of International Health for the University of Texas at Houston since 1971. Dr. Ehrlich assumed his new post in mid-May 1979.