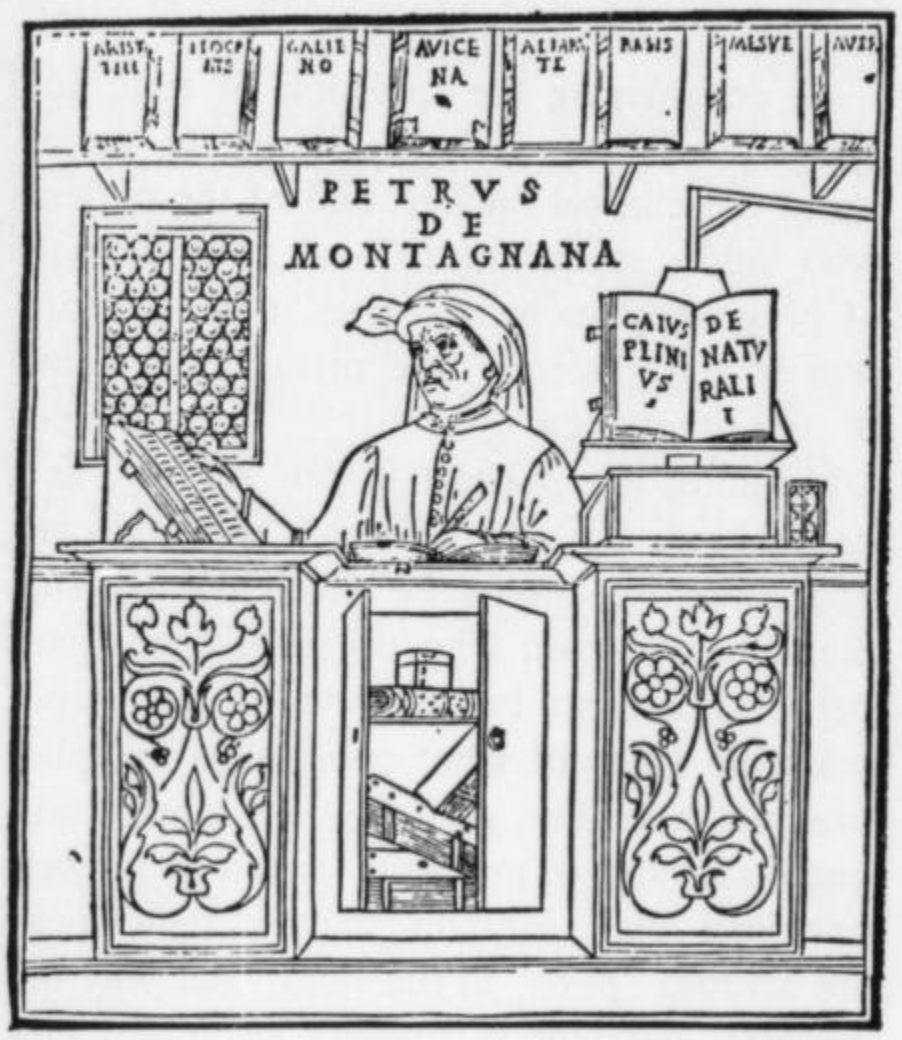

EDITORIAL

HUMAN PREGNANCY NUTRITION: A CLINICAL VIEW

WITH THE RECOGNITION that a number of common complications of human pregnancy are directly caused by malnutrition, it becomes possible to develop for the clinical obstetrician a simplified, practical, and scientific view of human prenatal nutrition.[1, 3, 4, 11, 12, 16, 17] This is a plea for the application in clinical obstetrics of a *holistic* view toward prenatal nutrition in the light of our present scientific knowledge. No matter how complex the underlying biochemical basis of nutrition, the clinical physician and the pregnant woman under his care have a practical problem of maintaining adequate nutrition day by day throughout pregnancy and lactation in a specific socioeconomic environment.

Biochemists have recognized certain essential nutritional requirements for optimal health, growth, and reproduction; these include oxygen, water, amino acids, fatty acids, vitamins, minerals, and total calories. It is becoming increasingly more apparent that in the practical clinical problems of human nutrition these nutrients cannot be considered as separate entities because of complex interrelationships and variations in clinical needs. From long human experience we now know the basic elements that constitute *adequate* prenatal nutrition. Our basic challenge is to make sure that each pregnant woman entrusted to our care has adequate nutrition to meet the needs of her own individual pregnancy.

ADEQUATE PRENATAL DIET

The U. S. Department of Agriculture has prepared a practical guide for well-balanced human nutrition which is being widely used by nutritionists and educators.[5] It has immediate application in clinical obstetrics. A daily food plan has been developed in which foods are classified according to their contributions of several nutrients, although emphasis is placed on key foods as important sources of certain nutrients.[10] This daily food plan gives a basis for an adequate diet and at the same time permits the individual wide choice in her food selections. The 4 essential groups of foods recognized and the fundamental plan for each day's intake are as follows:

1. MILK GROUP. A quart of milk daily is basic. Cheese and ice cream are readily available and should be encouraged as foods.

2. MEAT GROUP. Two or more servings of meat are mandatory and should include beef, veal, pork, lamb, poultry, fish, and

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The illustration at the top of the page is from a 15th-century German woodcut. (The Bettmann Archive.)

eggs, with dry beans, peas, and nuts as alternates. One serving equals 2 or 3 oz. of boneless cooked meat, poultry, or fish; 2 eggs; or 1 cup of cooked dry beans or peas.

3. VEGETABLE-FRUIT GROUP. Four or more servings should include a dark green leafy vegetable and a deep yellow vegetable at least every other day; a citrus fruit or other fruit or vegetable high in Vitamin C; other fruits and vegetables, including potatoes. One serving equals one-half cup of vegetables or fruit.

4. BREAD-CEREAL GROUP. Four or more servings in this category should include whole grain, enriched, and restored products. One serving equals 1 slice of bread, or one-half to three-fourths cup of cooked cereal.

This fundamental plan will supply one-half to two-thirds of caloric requirements and most of the known vitamin requirements. Since there is an increased need for high biologic quality proteins during pregnancy, it is wise to advise consumption of meat twice daily in addition to 2 eggs daily. Because eggs are readily available and offer some of the highest biologic quality protein, their use should be emphasized.

DIETARY SUPPLEMENTS INDICATED IN THE PRENATAL DIET

The use of supplemental iron, multiple vitamins, and calcium has been institutionalized in prenatal care in the United States. Streiff and Little, who have confirmed Hibbard's report of the association of folic deficiency with abruption of the placenta, have recently advocated prenatal folic acid supplementation. The use of supplemental iron seems to be firmly established because of the increased iron requirements for pregnancy and the relative difficulty in intestinal absorption of iron. The use of other dietary supplements has no established scientific basis when it is clearly evident that a good, well-balanced diet will furnish adequate amounts of these nutrients.

In considering the question of folic acid supplementation, it is necessary to understand the clinical background of the patients who suffer severe nutritional complications of pregnancy such as severe anemia, abruption of the placenta, and metabolic toxemia of late pregnancy.[2, 6-9, 13-15, 19] These women are among the poorest in our society, as a general rule have no adequate prenatal care, and therefore cannot be given dietary supplements. Women who do receive adequate prenatal care can be instructed in the simple, scientific ideas of what constitutes adequate prenatal nutrition, and they can obtain adequate amounts of nutrients from a good, well-balanced diet. Human dietary deficiencies are seldom "pure" in the sense that only one essential nutrient is missing from the diet. The data presented by Streiff and Little on folic acid deficiency in pregnancy suggest that more than folic acid deficiency is involved because a number of their patients with normal deliveries had serum folate levels as low as those observed in the women with abruption of the placenta. A reasonable conclusion to be drawn from their work is that the functional view of human prenatal nutrition presented here should be more widely recognized and applied in clinical obstetrics, and *not* that folic acid supplementation is indicated.

Regarding the question of calcium supplementation, there is little scientific evidence to support it. Since milk is such an excellent source of both high biologic proteins and calcium, it should be depended on to furnish the bulk of calcium. This can be easily explained to the average pregnant woman and will serve as a stimulus for her to drink enough milk throughout pregnancy.

MATERNAL NUTRITION IS FETAL NUTRITION

For several years I have instructed prenatal clinic patients in these basic principles of pregnancy nutrition; their general repro-

ductive performance has been excellent.[2] In teaching prenatal nutrition I have found most women receptive to the idea that they must pay particular attention to their own good nutrition so that they can adequately feed the baby growing within them. A premature rate of approximately 2% among women attending a county welfare clinic has been encouraging. Pediatricians will take increasing interest in *fetal* nutrition when this basic view is clearly established, for they are continually called upon to make heroic efforts to salvage infants damage by *maternal* malnutrition.

CONCLUSION

For many years good farmers have recognized the vital importance of adequate pregnancy nutrition for optimum reproduction of their livestock. Almost 20 years ago John M. White, a practical farmer and county agent for 50 years, stated it well:

The result of the year's work with hogs depends more largely on the management and feeding of the sows during pregnancy than during any other period. If the sows are not properly conditioned for farrowing, the pigs will not get a good start, and consequently can not make the growth and profit they should.

This simple, common-sense logic so aptly illustrates the holistic view of human pregnancy nutrition and clearly indicates our own responsibilities as modern obstetricians.

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REFERENCES

1. BREWER, T. H. Role of malnutrition, hepatic dysfunction and gastrointestinal bacteria in the pathogenesis of acute toxemia of pregnancy. *Amer J Obstet Gynec 84*:1253, 1962.
2. BREWER, T. H. Good prenatal nutrition prevents toxemia of late pregnancy. *Postgrad Med 39*:A-119, 1966.
3. BREWER, T. H. *Metabolic Toxemia of Late Pregnancy: A Disease of Malnutrition.* Thomas, Springfield, Ill., 1966.
4. BURKE, B. S., BEAL, V., KIRKWOOD, S. B., and STUART, H. C. Nutritional studies during pregnancy. *Amer J Obstet Gynec 46*:38, 1943.
5. *Essentials of an Adequate Diet . . . Facts for Nutrition Programs.* Home Economics Research Report No. 3, U. S. Department of Agriculture, Agriculture Research Service, Washington, D. C., 1957.
6. FERGUSON, J. H. Pregnancy hemoglobin levels in the rural south. *Amer J Obstet Gynec 60*:411, 1950.
7. FERGUSON, J. H. Maternal death in the rural south: A study of forty-seven consecutive cases. *JAMA 146*:1388, 1951.
8. FERGUSON, J. H., and KEATON, A. Studies of the diets of pregnant women in Mississippi. I. The ingestion of clay and laundry starch. *New Orleans Med Surg J 102*:460, 1950.
9. FERGUSON, J. H., and KEATON, A. Studies of the diets of pregnant women in Mississippi. II. Diet patterns. *New Orleans Med Surg J 103*:81, 1950.
10. *Food for Fitness: A Daily Food Guide.* Leaflet No. 424, U. S. Department of Agriculture, Washington, D. C., 1964.
11. HIBBARD, B. M. The role of folic acid in pregnancy with particular reference to anemia, abruption and abortion. *J Obstet Gynaec Brit Comm 71*:529, 1964.
12. MAQUEO, M., AVALA, L., and CERVANTES, L. Nutritional status and liver function in toxemia of pregnancy. *Obstet Gynec 23*:222, 1964.
13. MAYER, J. Food habits and nutritional status of American Negroes. *Postgrad Med 37*:A-110, 1965.
14. NEWTON, M. The continuing problem of eclampsia. *Surg Gynec Obstet 118*:1055, 1964.
15. O'ROURKE, D. E., QUINN, J. G., NICHOLSON, J. O., and GIBSON, H. H. Geophagia during pregnancy. *Obstet Gynec 29*:581, 1967.
16. POEN, H. T., and DJODJOPRANTO, M. The possible etiologic factors in hydatidiform mole and choriocarcinoma. *Amer J Obstet Gynec 92*:510, 1965.
17. STRAUSS, M. B. Observations on the etiology of toxemias of pregnancy. *Amer J Med Sci 190*:811, 1935.
18. STREIFF, R. R., and LITTLE, A. Folic acid deficiency in pregnancy. *New Eng J Med 276*:776, 1967.
19. TAYLOR, R. D., and SWARTWOUT, J. R. Biochemical survey of protein sufficiency during pregnancy in urban women. *Obstet Gynec 29*:244, 1967.
20. WHITE, J. M. *The Farmer's Handbook.* Univ. of Oklahoma Press, Norman, 1948, p. 224.