Vitamins and Minerals in Pregnancy and Lactation

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Preface

Clearly, mother and child face special nutritional problems during pregnancy and lactation; but optimization of nutrition during these periods still poses a number of questions, some of which this volume attempts to answer.

Although it is no surprise that the supply of vitamins and trace elements in the mother, the maternal milk, the fetus, and the baby all exhibit considerable individual differences, some recent research findings are of particular interest: They confirm the mother's need for special dietary supplements of vitamins, minerals, and trace elements during pregnancy and lactation, a phenomenon that often shows wide individual and regional variations. Signs of deficiency can be determined biochemically before they are manifested clinically. The same is true in overdosage and intoxication. For example, the fetus and the suckling infant show higher serum levels for water-soluble vitamins than the mother, while the values for fat-soluble vitamins are lower. Even in "normal" pregnancies, deficiencies in folic acid, iron (or ferritin), calcium, phosphorus, and vitamin B_6_ are observed. The rate of fetal abnormality (neural tube defects, miscarriage) is higher in mothers with folic acid deficiency. The rate of morbidity and mortality is higher in infants deficient in vitamin A. In premature infants born before week 32 of gestation, hypovitaminosis E leads to a higher incidence of cerebral hemorrhage. Infants fed exclusively on breast milk, who did not receive vitamin K prophylactically at birth, are at risk of cerebral hemorrhage between the fourth and sixth weeks of life.

Among the subjects included in this volume are the significance of iodine deficiency and intoxication for cerebral metabolism and of zinc deficiency for immune development. New topics, such as the part played by the placenta in the metabolism of vitamins, minerals, and trace elements; the influence of fetal metabolism and amniotic fluid; and the levels of substances in the amniotic fluid and their significance for the fetus are also covered in this book. Other topics include the problem of rickets in breast-fed infants and that of hypoferric anemia and the considerable differences in maternal milk after premature deliveries and at term deliveries.

The results presented in this book will prove fruitful ground for future research in this field. This volume will be of use to obstetricians, neonatologists, and those involved in public health research.

HERIBERT BERGER
Foreword

Health improvement of the pregnant and lactating mother and her child through optimal nutrition has always been the aim of the Nestlé Company. The series of Nestlé Nutrition Workshops (to date, 14 published volumes) attests to this continuous interest, starting with Volume 1, dealing with calories and protein requirements of the pregnant mother, continuing with Volume 8, which examines trace elements in pregnancy and lactation, in two chapters. In Volume 13, one chapter is devoted to essential fatty acids and brain development, and the whole of Volume 15 centers on the biology of human milk.

The latest delivery, Volume 16, based on a joint symposium between Nestlé and Hoffmann-La Roche, contributes additional knowledge on vitamins and minerals in pregnancy and lactation, but the subject is still not completely exhausted. For example, maternal deficiency in certain elements such as B vitamins or iodine can almost certainly induce fetal defects, whereas other nutritional deficiencies do not have the same effect because the fetus behaves like a perfect parasite pumping whatever is necessary for its normal growth from the mother. The same is true for lactation, during which vitamin E or iron intake by the mother seems to have no influence on breast milk composition, whereas, in contrast, zinc intake or vitamin B₆ intake is reflected in the milk composition.

The existence of such a difference is one of the puzzling questions that scientists will have to discuss in a future Nestlé Nutrition Workshop.

Pierre R. Guesry, M.D.
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There is no doubt that the nutritional status of the mother at the beginning of pregnancy and the nutrition of the mother during pregnancy and lactation have a strong impact on the outcome of pregnancy and on the health of mother and child. With regard to micronutrients, interestingly enough, only little scientific work has been done to prove this statement. The aim of the Hoffmann-La Roche–Nestlé symposium has been to bring together distinguished scientists working in this field to obtain a comprehensive picture of the state of the art and to stimulate new research.

The present volume contains the text of the main lectures and statements.
made during discussion. It is hoped that the volume will be of use to those who are confronted with the daily problems in obstetrics and neonatology as well as to those who are involved in public health research on the improvement of health for mother and child.

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