Nutrition Support for Infants and Children at Risk
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Preface

The first manifestation of atopic diseases in many cases is atopic dermatitis, which may or may not be associated with IgE-mediated allergic reactions to food proteins, particularly hen’s egg and cow’s milk. Prospective birth cohort studies have provided clear evidence for the fact that infantile IgE responses to food protein may not just indicate infantile food allergy, but also have to be considered as the earliest markers for the atopic march resulting ultimately in persistent allergic inflammation of the upper or lower airways (bronchial asthma). For the pediatric allergist it is important to understand the mechanism regulating IgE responses as well as potential options for interventions aiming at primary or secondary prevention.

For decades breastfeeding was considered as the optimum measure for preventing food allergy in childhood. However, recent data indicate that the effects regarding the atopic march are limited. Different approaches include the use of hypoallergenic formulae, in which the allergenic activity has been reduced by enzymatic treatment. Prospective well-controlled trials have indeed suggested that this approach of preventative intervention has a role at least in the prevention of early atopic dermatitis. Other attempts in modulating infantile immune responses are represented by the addition of probiotics (lactobacilli) or prebiotics (oligosaccharides) to infant formulae. The long-term effects of these approaches are still under investigation.

I am particularly pleased that allergic diseases in childhood are acknowledged by a wide spectrum of pediatricians, nutritionists and public health authorities as a major health problem for children in the 21st century. Therefore, the challenge of prevention and early intervention needs to be met not only by pediatric allergists, but by all pediatricians, who share responsibility for a child’s health from infancy to adolescence.

U. Wahn
There is universal consensus that quantity and quality of nutrition is relevant for general health, both in the short and the long-term. However, the gastrointestinal tract, whose most relevant function is the absorption of nutrients, is diseased in many situations. Acute gastroenteritis causes transient but sometimes severe alterations of gastrointestinal function. Other diseases, such as food allergy, celiac disease and Crohn’s disease, cause further chronic alterations. Fundamental research has highlighted in recent years the molecular basis of some diseases causing chronic enteropathy such as microvillous atrophy. Extrapolation of this new knowledge in rare etiologies of severe chronic enteropathies to the enteropathy as it occurs in cow’s milk protein allergy offers an interesting insight in the latter. After the molecular aspects, the main causes of chronic enteropathy were developed. Chronic enteropathy in developing countries is still a major cause of death of children (>1 million deaths/year). The etiologies of enteropathy differ in the developed and developing world. A direct interaction exists between intestinal mucosal injury, malnutrition and impaired immunity. Recovery from chronic enteropathy is dependent on proper nutritional management and rehabilitation. Parenteral nutrition is the final nutritional option in intestinal failure. In intestinal failure, parenteral nutrition can be life-saving but is at the same time potentially dangerous. The earlier (partial) enteral nutrition can be introduced, the better: ‘If the gut works, use it’. Minimal enteral feeding decreases the need for total parenteral nutrition by optimizing intestinal adaptation. New semielemental diets directly influence inflammation and food intolerance. Nutrition has become more than an ingestion of calories and nutrients; the concept of ‘functional food’ opens a new area of research, of major interest in many different diseases such as gastrointestinal infection, celiac disease, or inflammatory bowel disease. Immunologic properties of lipids, nucleotides and probiotics have become a topic of research. It has become obvious that the strain specificity of probiotic organisms is of major importance. New semielemental diets are well tolerated and accepted. Many diseases affect gastrointestinal function by altering the barrier function. Also medications, such as antimycotic drugs, cause mucosal injury. Noninvasive techniques may provide a better way to assess the effects of stress and also a simple way to assess nutritional interventions. Finally, interest will be given to nutrition in the cholestatic patient. Children with chronic liver disease are not only prone to severe malnutrition, they also have special nutritional needs. The topics in the second part of the symposium (Gastrointestinal Disorders) highlight that nutrition has become more than feeding. Nutrition has functional properties, which means that feeding actively intervenes with therapy.

Y. Vandenplas
Nutrition plays a critical role in the promotion of normal health and prevention of disease. Nowhere is this more important than during infancy and childhood, where even short periods of malnutrition may have long-lasting effects on growth, development and health in adult life. During infancy and childhood, there are several high-risk scenarios for the development of malnutrition and these are the focus of the current workshop.

Although the incidence of prematurity has not changed smaller and more immature infants are now surviving, presenting a series of unique challenges to the neonatologist. It takes time to establish adequate dietary intakes in the ‘sick’ immature infant. Once established, adequate intakes are rarely maintained throughout hospital stay. In effect, all infants accrue a nutritional deficit, the smaller the infant the greater the deficit.

Nutritional requirements are not well defined in preterm infants. It was assumed that needs were similar for all low-birth-weight infants. Yet, recent data suggest that needs change with advancing maturity and one formulation may not meet all requirements. Requirements are also based upon needs for maintenance and normal growth; no allowances are made for ‘catch-up’ growth.

Furthermore, sensitive, accurate and precise measures of nutritional outcome are not well defined in these infants. Weight gain is the primary reference for assessing adequacy of intake but this tells little about the composition of gain, a critical consideration when interpreting the relationship between early growth and later health.

The net effect of these uncertainties is that 100% of very-low-birth-weight infants are growth retarded at hospital discharge, the smaller and more immature the infant the greater the degree of growth retardation at initial hospital discharge. In the section on Nutrition for Preterm Infants, many of these issues will be reviewed, as will strategies for improving growth in these high-risk infants.

R.J. Cooke
Foreword

The 59th Nestlé Nutrition Pediatric Workshop on ‘Nutrition Support for Infants and Children at Risk’, held in Berlin in early April 2006, represents an important milestone in this workshop series since it is 25 years since the 1st Nestlé Nutrition Workshop entitled ‘Maternal Nutrition in Pregnancy – Eating for Two’ chaired by Prof. John Dobbing was published in 1981. Since then, two series of workshops have emerged giving rise to their respective books of proceedings, the so-called ‘Blue Series’ emanating from the pediatric workshops, with over 6,000 copies per workshop making it one of the largest medical publication in the world, and the ‘Silver Series’ resulting from our clinical and performance nutrition workshops. Moreover, we are proud to announce that the high quality of the ‘Blue Series’ has been recognized by the US National Libraries of Medicine, meaning that the scientific review articles they contain are now indexed on Medline.

The three topics covered within this workshop have already been addressed in previous Nestlé Nutrition Pediatric Workshops. The first of our workshops focusing on allergy took place in 1987, followed by two workshops in 1993 and 2003 dealing with aspects of intestinal immunology and the etiology, prevention and treatment of allergy. The 2nd Nestlé Nutrition Workshop on ‘Acute Diarrhea: Its Nutritional Consequences in Children’ was followed by ‘Chronic Diarrhea’ in 1983, ‘Diarrheal Diseases’ in 1993 and ‘The Control of Food and Fluid Intake in Health and Disease’ in 2002. As for nutrition for premature infants we held two workshops in 1992 and 1998 reviewing advances in this field. But nutrition of the premature infant has advanced considerably through modern intensive care medicine, and we now have to care for 500-gram premature infants needing proper nourishment after intensive care in order to grow and develop appropriately.

We are deeply indebted to the three chairpersons of this workshop, Prof. Ulrich Wahn from Berlin, Prof. Yvan Vandenplas from Brussels and Richard Cooke from Memphis, experts recognized worldwide in their respective fields of nutrition for allergy, gastrointestinal disorders and prematurity, for putting together this exciting workshop program. We also
thank Dr. Mike Possner and his team from Nestlé Nutrition in Germany for the excellent logistical support and for enabling the workshop participants to enjoy the wonderful city of Berlin.

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