Early Childhood Exposures and Risk for Adult Disease

Alison Chu, MD

As pediatricians, we are given the responsibility to not only care for our patients in the present, but also to protect their future health. Well-child visits present the opportunity to optimize adult outcomes in several ways: to provide anticipatory guidance in topics of safety, nutrition, and lifestyle choices; to evaluate and promote healthy emotional and social development; and to provide immunizations to protect against future disease. Subspecialists also carry the responsibility as we must weigh the potential benefits and risks of diagnostic testing and therapeutic options. In caring for our patients, it is essential for pediatricians to educate ourselves on the rapidly accumulating evidence that early childhood exposures affect risk for future disease. Early childhood exposures that may affect risk of disease range from essential life-saving therapies, such as mechanical ventilation in an extremely premature infant, to antibiotic exposure for presumed otitis media. It is clear that in this day and age, where the Internet has made it easier for parents to arm themselves with information, and sometimes misinformation, we need to educate ourselves on the potential risks of any intervention we suggest. There is a rapidly growing body of evidence that suggests that the human body maintains a fragile balance, and that while we are amazingly adaptive in our ability to maintain the outward appearance of good health, the invisible effects of seemingly innocent exposures may be at work contributing to the development of chronic disease.

Our goal for this issue of Pediatric Annals is to introduce some of the recent research that highlights the notion of developmental programming—as early childhood is a vulnerable period in which the body’s organs are still developing and susceptible to environmental exposures, and how these exposures may translate into risk for adult disease.

The article by Dr. Theodore De Beritto and me highlights perinatal exposures that may increase risk for cardiovascular disease for premature or small for gestational age birth weight infants. We also briefly explore some of the proposed mechanisms for this association.

Dr. Kalpashri Kesavan’s article is a thought-provoking review of early exposures to sedative and analgesic medications commonly used in the neonatal and pediatric intensive care unit and risk for adverse neurodevelopmental outcomes.

Drs. Sushmita G. Yallapragada, Colleen B. Nash, and Daniel T. Robinson present a comprehensive overview on the development of the microbiome, the adverse effects that antibiotic exposure has on the microbiome, and how this may contribute to risk for obesity and metabolic disease.

Lastly, Drs. Vivian Y. Chang and Tom B. Davidson contribute an excellent piece on various early childhood exposures that are known risk factors for the development of malignancy, providing the pediatric practitioner with clinically relevant information on how to educate families to minimize these exposures.

This compilation is our attempt to educate pediatricians across multiple specialties within the community and the academic setting with the evidence that exposures during childhood have implications for long-term health outcomes. As health care providers, we should continue to carefully weigh the risks and benefits of diagnostic testing and treatment options, and to educate our patients and their families on the long-term risks of various exposures as well.

doi: 10.3928/00904481-20151112-06

About the Guest Editor

Alison Chu, MD, is an Assistant Professor-in-Residence at the University of California, Los Angeles (UCLA), in the Division of Neonatology, Department of Pediatrics. She completed her medical education at Northwestern University in Chicago, IL, and received her pediatric residency and neonatology fellowship training at the University of Chicago. Her current research interests include perinatal exposures and risk for adult cardiovascular disease. During her fellowship training under mentor Dr. David Gozal (University of Chicago, Pritzker School of Medicine), she completed a study using an animal model of postnatal intermittent hypoxia exposure and measured various markers for cardiovascular disease in adult mice. She is currently collaborating with Dr. Sherin Devaskar (Mattel Children’s Hospital, UCLA), as well as colleagues in the Departments of Obstetrics and Gynecology, Pathology, and Molecular, Cell, and Developmental Biology at the University of California-Los Angeles, to evaluate the role of placental insufficiency in preterm labor and intrauterine growth restriction, and its potential contribution to endovascular dysfunction and later cardiovascular disease.

Address correspondence to Alison Chu, MD, via email: alisonchu@mednet.ucla.edu.