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DISCOVERY AT THE BEDSIDE: THE INTERSECTION
BETWEEN ASTHMA AND SICKLE CELL DISEASE

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208 LIGHT HALL



VANDERBILT  UNIVERSITY
MEDICAL CENTER

DISCOVERY AT THE BEDSIDE: THE INTERSECTION BETWEEN ASTHMA AND SICKLE CELL DISEASE

Sickle cell disease is the most common genetic disease screened for in the newborn period, occurring in 1 in 2,400 births in the general population and 1 in 400 births in individuals of African descent in the United States. Vaso-occlusion is the basis for the two most common morbidities in SCD, pain and acute chest syndrome episodes. Hydroxyurea is the only FDA-approved therapy to prevent vaso-occlusive episodes. The major cause of death in adults is lung disease. However, the epidemiology, natural history, and established interventions to prevent pulmonary complications are poorly defined. More specifically, very limited data exists on how to prevent or treat life threatening acute chest syndrome, an idiopathic rapidly progressive pulmonary process specific to sickle cell disease. Asthma is one of the most common morbidities in children, and disproportionately affects children of African descent. Until recently, no significant association was noted between these two common inflammatory conditions.

Based on an observation at the bedside, we noted that children with sickle cell disease and asthma appeared to have a higher rate of admission to the hospital for vaso-occlusive pain episodes and acute chest syndrome when compared to children with sickle cell disease without asthma. Over the course of the following decade, our translational research laboratory has orchestrated a series of inter-related clinical and basic studies to determine the strength and elucidate the mechanism of these associations. The focus of this lecture is to describe the initial and subsequent steps taken by our laboratory to create a multi-disciplinary translational research team. We have abundant murine and human data suggesting that asthma is associated with vaso-occlusive episodes and premature death. We present evidence demonstrating for the first time that cysteinyl leukotriene(CysLT) levels are increased in adults with SCD compared to healthy controls and that therapy to reduced CysLT is a promising strategy for treatment of SCD-related vaso-occlusive complications.



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Dr. Michael DeBaun is an internationally recognized physician–scientist whose research has resulted in fundamental advances in hematology and oncology including the genetics of cancer predisposition syndromes and sickle cell disease (SCD), where his efforts are focused on the pathogenesis of stroke and lung disease. He has elucidated the epidemiology, clinical significance of silent cerebral infarction in children with sickle cell anemia, setting the groundwork for an international multi-centered clinical trial, the Silent Cerebral Infarct Transfusion Trial designed to decrease further neurological injury in children with SCD. Dr. DeBaun is also the principal investigator of the Sleep and Asthma Cohort Study, an international observational study designed to elucidate the clinical and biological basis of why two common co-morbidities, asthma and sleep disordered breathing are associated with increased morbidity and premature death in persons with SCD. He was elected to the Institute of Medicine, the National Academy of Sciences, in 2009.

Dr. DeBaun attended Howard University where he graduated magna cum laude (chemistry) and Phi Beta Kappa. He attended Stanford University Medical School receiving his Medical Doctorate and a Master's Degree in Health Services Research. Dr. DeBaun completed pediatric residency at St. Louis Children's Hospital and Washington University School of Medicine where he served as Pediatric Chief Resident and later completed his Pediatric Hematology and Oncology Fellowship. He subsequently received a Masters in Public Health from the Johns Hopkins School of Public Health and was an epidemiology fellow at the National Cancer Institute. In 2004, Dr. DeBaun was the primary physician author for the Sickle Cell Disease Treatment Act, now a Federal Law in the United States focused on creating community based SCD centers and improving access to sickle cell trait testing. Prior to his faculty appointment at Vanderbilt, he was the inaugural recipient of the Ferring Family Chair in Pediatrics, and Professor of Neurology and Biostatistics at Washington University School of Medicine. As a faculty member, the medical school presented him with the Distinguished Faculty Award for Translational Research, and the Pediatrics Clinical Teacher of the Year Award, twice. His national honors include induction into the American Association of Physicians, and the National Academy of Sciences, Institute of Medicine. He was inducted into the Association of American Physicians in 2008.
