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Spotlight

Steven A. Abrams M.D.

Professor of Pediatrics-Neonatology and USDA/ARS Children's Nutrition Research Center

A self-proclaimed perpetual MIT nerd, Dr. Abrams claims that his mediocrity in chemical engineering and a collapse in oil prices led him to switch to a career in medicine. That was the first of many events to shape his career path. Eventually, he melded engineering with medicine and entered the field of international medicine.

Preferring to work with babies, Dr. Abrams chose well before graduating medical school to specialize in neonatology. During a fellowship interview at Baylor College of Medicine, he met scientists working on new bone density equipment that they wanted to adapt for babies to study calcium nutrition—a combination of engineering and medicine. So after his Baylor fellowship in neonatal-perinatal medicine, he completed two more fellowships, in nutrition and use of stable isotopes to assess mineral status, at the National Institutes of Health (NIH).

Back at Baylor in 1991, Dr. Abrams began to study calcium needs in adolescents. That had nothing to do with neonatology, but NIH research grants were more readily available to study calcium intake and absorption in adolescents, and he was interested in the physiology by which bone is formed throughout childhood.

Then in 1993, 10 years after graduating medi-

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The Front Line

International nutrition and neonatal education

Over the past 5 years, Baylor College of Medicine nutrition experts have traveled to as many as 14 other nations to combat malnutrition and to enhance neonatal education globally. Through research studies and symposia, the Baylor multidisciplinary team educates nursery staff on medical, nursing, and nutritional management of at-risk infants and children and brings new findings home to further benefit children in the U.S.

Research dedicated to expanding scientific knowledge about pediatric micronutrient deficiencies brought the Baylor nutrition team to such countries as Panama, Peru, Pakistan, Mexico, and Botswana. That team, led by Dr. Steven Abrams, Professor of Pediatrics at Baylor, has collaborated with several organizations, among them the National Aeronautics and Space Administration (NASA), United Nations Children's Fund (UNICEF), and the Pan-American Health Organization (PAHO).

"Our research focuses on the metabolism of nutritionally important minerals including calcium, magnesium, zinc, and iron," said Dr. Abrams. "We are especially interested in the optimal forms and amount of iron and zinc to provide to small children, especially those who live in developing countries where iron deficiency anemia and zinc deficiency are extremely common."

In Panama, a delegation launched a hospital nutrition clinic and facilitated a union of

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Breaking News

Preterm birth: Where we are, where we are going

by Michael O. Gardner, MD, MPH
Associate Professor, Gynecology & Obstetrics

Preterm delivery is an important problem facing obstetricians, neonatologists, and pregnant women and their families. Though less than 12% of U.S. deliveries are preterm births, they are the largest cause of infant mortality not due to congenital malformations and are the main cause of permanent sequelae. Despite much effort, preterm births have increased by almost 20% since the early 1980s, mostly attributable to assisted reproductive technology (ART) and increased risk of multiple gestation.

Practitioners might reasonably assume that the ability to predict which patients are most likely to deliver preterm would enhance the ability to prevent these births. Physicians have tried to make such predictions, including through assessment of epidemiological factors such as a low pre-pregnancy body mass index (<19.6), African-American race, maternal history of hypertension, cigarette smoking, illicit drug use, and, the greatest risk factor, previous history of preterm delivery. Unfortu-

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Editor's Corner

Increasing global scopes

Care of the newborn infant is no longer parochial but rather global in scope. The lessons learned in the United States, Canada and developed countries are the same lessons learned in the developing world. Infectious diseases have a worldwide impact (eg, influenza, AIDS, SARS, and tuberculosis). The lessons learned about improving neonatal care are being taught everywhere. In this issue of *NeonatalNews.Net,* we feature articles about nutritional research efforts spearheaded by Baylor researchers and how a new study, published by Indian researchers, has applicability around the world.

Michael E. Speer, MD
Professor of Pediatrics-Neonatology
Baylor College of Medicine

Spotlight

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cal school, he became involved in U.S. public health policy and began research using stable isotopes of iron and zinc. Soon, colleagues at Johns Hopkins and UC-Davis recruited Dr. Abrams to collaborate on nutrient fortification studies in Peru. Thus, he began his journey in international health.

"I got the travel bug, joined up with space traveler Dr. David Hilmers, and for most of the last 4 years have crossed the globe doing research studies in nutrition," said Dr. Abrams. "We've had many scientists from other countries train with us in Houston. We're currently working in over a dozen countries and the list keeps expanding. I continue to do the calcium research in teens in the U.S., but I enjoy the international work quite a bit. Philosophically, we recognize that it is impossible for any one group of Americans or any one approach to completely change the nutritional status or infant care in a country. But by working closely with a few physicians and scientists in developing countries, we hope to develop a model for such interactions that can be applied more widely."

International

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government and private groups to fight undernourishment in the region. The delegation included the team from Baylor and Texas Children's Hospital—Dr. Abrams, a neonatal dietitian, a neonatal nurse and several medical students. The team also has presented a NICU education lecture series and hands-on bedside rounds to clinicians in Peru and Panama. Return visits have deepened the understanding of clinical and educational needs and increased the team's focus.

This international outreach and research is made possible by collaboration among Baylor College of Medicine, Texas Children's Hospital, and the USDA/ARS Children's Nutrition Research Center (CNRC). For more information about the work being conducted in Dr. Abrams' lab, go to www.bcm.tmc.edu/cnrc/faculty/abrams_lab/index.htm.

Research Highlights

Grants/Funding

Heidi Karpen, MD, The role of Caveolin-1 and cholesterol in the regulation of hedgehog signaling pathway. USDA/ARS non-competitive grant renewal. $39,176.

Kirsten A. Kienstra, MD, Contribution of bone marrow-derived cells to nevascularization during wound healing. LifeCell Corporation, $63,567.

Events

Steven Abrams, MD, conducted a series of training programs on neonatal resuscitation in The Gambia. Presented *Stable Isotope Methods in Micronutrient Research* at a research meeting of the International Atomic Energy Agency in Bangkok, Thailand.

James M. Adams, MD, included in *Best Doctors in America for 2003-2004.*

Diane Anderson, PhD, appointed to the strategy planning committee of the Commission of Dietetic Registration, the credentialing agency for the American Dietetic Association.

Caraciolo J. Fernandes, MD, received the Baylor Pediatric Award of Achievement in Teaching by Baylor College of Medicine Department of Pediatrics Faculty Teaching Awards Committee for developing, implementing, and teaching the NALS curriculum.

Ian Griffin, MD, invited speaker, American Dietetic Association annual meeting, October in San Antonio, Texas. Topic: *Focus on Follow-up of Low Birth Weight Infants.*

Heidi Karpen, MD, speaker at 10th annual South Central Conference on Perinatal Research at Lakeway in Austin, Texas. Topic: *Transcriptional Regulation of The Headgehog Receptor Patched.*

Chantal Lau, PhD, keynote speaker at Joe DiMaggio Children's Hospital, Hollywood, Florida, Neonatal Intensive Care Unit Conference. Topic: *Development of Suck-Swallow-Breathe Coordination in The Preterm Infant.*

Michael E. Speer, MD, received the Texas Perinatal Association's Helen Farabee Award honoring his sustained contributions to health care of woman and their newborn infants. Was re-elected President of the American Academy of Pediatrics Texas Chapter.

Marlene Walden, PhD, RN, presented *Neonatal Pain Assessment and Management* at

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Journal Review

Ramji S, Rasaily R, Mishra PK et al. Resuscitation of asphyxiated newborns with room air or 100% oxygen at birth: A multicentric clinical trial. *Indian Pediatr* 2003;40:510-517.

by Michael E. Speer, MD
Professor of Pediatrics

Introduction: Recent studies suggest that resuscitation at birth of depressed neonates using room air (RA) may be equal to or superior to resuscitation with 100% oxygen (O). Additionally, resuscitation with 100% oxygen has been associated with the excess release of oxygen free radicals during posthypoxemia reoxygenation. In India, two thirds of births occur either at home or in facilities where oxygen is not available. Since birth asphyxia accounts for 24.3% of neonatal deaths in that country, the use of room air for resuscitation could potentially decrease mortality due to this condition.

Methods: This was a quasi-randomized trial carried out in 4 medical centers in India between 1995 and 1997. Infants born on even numbered days were resuscitated using room air; those born on odd numbered days with 100% oxygen. Newborn infants >1000 grams birth weight that required assisted ventilation were included in the study. Infants with lethal anomalies, hydrops, and congenital lung or cyanotic heart defects were excluded. Primary outcome was the Apgar score at 5 minutes. Secondary outcomes included neonatal mortality and HIE within the first 7 days of life. Infants in the room air group who continued to have bradycardia after 90 seconds of room air resuscitation (treatment failures) were switched to 100% oxygen. Infants resuscitated with 100% oxygen who had bradycardia at 90 seconds of life also were noted.

Results: At the 4 centers, 433 infants were eligible, two were excluded. Of the enrolled infants, 210 were assigned to the RA group; 221 to the O group. The two groups were comparable in terms of duration of labor, induction of labor, presence of fetal distress, and/or meconium-stained liquor and type of delivery. They were also comparable for birth weights and gestation. At 1, 5, and 10 minutes, heart rates in both groups were comparable. Median Apgar scores at 5 and 10 minutes were the same in both groups. Similarly, the median time to first breath was not different between groups. Median time to first cry (2 vs. 3 minutes) and median duration of resuscitation (2 vs. 3 minutes) were significantly shorter in the RA group. The number of babies with stage II or stage III HIE during first 7 days of life was significantly different between the two treatment groups (17.1% RA; 24.9% O; $p < 0.05$). The two groups were not significantly different either in the overall or asphyxia-related mortality (12.4% and 10% RA vs. 18.1% and 13.6% O) or in the treatment failures observed between the two groups (39% vs. 40.3%). The subset of preterm infants was too small to analyze the effect of RA resuscitation.

Discussion: This study complements the work reported by Sougstad[1] and Vento[2] in suggesting that neonatal resuscitation with room air is an acceptable alternative to 100% oxygen in the term infant. Additionally, a difference was observed in the severity of HIE; this finding needs to be confirmed. Data do not yet exist regarding the use of room air for the resuscitation of the preterm neonate. Recent follow-up data[3] at 18–24 months have demonstrated no significant differences in somatic growth or neurologic handicap. Thus, in the absence of 100% oxygen, room air should be used for bag-mask ventilation in the depressed newborn.

References

1. Saugstad OD, Rootwelt T, Aalen O. Resuscitation of asphyxiated newborn infants with room air or oxygen: an international controlled trial: the Resair 2 study. *Pediatrics* 1998;102(1):e1.
2. Vento M, Asensi M, Sastre J, et al. Six years of experience with the use of room air for the resuscitation of asphyxiated newly born term infants. *Biol Neonate* 2001;79(3-4):261-7. Review.
3. Saugstad OD, Ramji S, Irani SF, et al. Resuscitation of newborn infants with 21% or 100% oxygen: follow-up at 18 to 24 months. *Pediatrics* 2003;112(2):296-300.

Contact Us

The Baylor College of Medicine Section of Neonatology has staff at hospitals in Houston's Texas Medical Center and in the local community.

To request a neonatal consultation at any of our locations, call
1-877-NEONATE
(1-877-636-6283)

Texas Medical Center locations

Texas Children's Hospital
6221 Fannin Street, Houston TX 77030
Director of Nurseries: James M. Adams, MD

For neonatal transport, call the Kangaroo Crew:
In Houston: 832-824-5550
Toll-free: 1-877-770-5550

St. Luke's Episcopal Hospital
6720 Bertner Avenue, Houston TX 77030
Director of Nurseries: Michael E. Speer, MD

The Methodist Hospital
6565 Fannin Street, Houston TX 77030
Director of Nurseries: Michael E. Speer, MD

Ben Taub General Hospital
1504 Taub Loop, Houston TX 77030
Director of Nurseries: Joe Garcia-Prats, MD

Community locations

East Houston Regional Medical Center
13111 East Freeway, Houston TX 77015
Director of Nurseries: Dilicia A. McLenan, MD

St. Luke's Community Medical Center - The Woodlands
17200 St. Luke's Way,
The Woodlands TX 77384
Director of Nurseries: Charles T. Hankins, MD

Twelve Oaks Medical Center - Sharpstown
6700 Bellaire Blvd, Houston TX 77074
Director of Nurseries: Tommy Leonard, MD

Woman's Hospital of Texas
7600 Fannin Street, Houston TX 77056

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Research (continued from page 2)

Texas Tech University Health Sciences Center's Pediatric Conference in Odessa, Texas.

Leonard E. Weisman, MD, presented *Neonatal Intensive Care: Special Patients and Families Require Special People and Programs* at the opening of the Mother and Child Center at Erasmus Medical Centre Sophia Hospital in Rotterdam, The Netherlands.

Preterm birth (continued from page 1)

nately, while risk scoring can identify which women have an increased risk of preterm births, proposed interventions to lower the preterm birth rate have not proved successful.

Several biochemical tests have been studied to find an identifier of risk. Positive fibronectin on a cervical swab in a symptomatic woman at 24 weeks' gestation is associated with 60-fold risk of preterm birth before 37 weeks; but, the positive predictive value of a positive fibronectin is 25–35%. In a woman presenting with contractions, a negative fetal fibronectin has a negative predictive value of 95%.

Research on the role of transcervical ultrasound has shown that a cervical length <25 mm is associated with a greatly elevated risk of preterm delivery. However, results of four randomized trials conflict concerning the efficacy of placing a cervical cerclage to reduce the risk. A large NIH-sponsored multicenter randomized trial is underway to address the issue. Currently, routine cervical cerclage is inappropriate based only on the presence of a shortened cervix.

The only two interventions proved to enhance the outcome of a preterm infant are a full course of antenatal corticosteroids and subsequent delivery in a perinatal center with a neonatal intensive care unit. Hopefully, research into the many potential causes of the preterm birth (eg, intrauterine infection, hormonal mediation of preterm contractions, and the effects of ART) will lead to effective treatment and prevention strategies.

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