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News and Information for BC/BE Neonatologists and Perinatologists

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IN THIS ISSUE

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Neonatology Today (NT) is a monthly newsletter for BC/BE neonatologists and perinatologists that provides timely news and information regarding the care of newborns and the diagnosis and treatment of premature and/or sick infants.

Upcoming Meetings

Continuous Quality Improvement Pre-Conference to NEO
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Feb. 11-14, 2010; Orlando, FL USA
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Speciality Review in Neonatology/Perinatology 2.0
Feb. 12-16, 2010; Orlando, FL USA
www.pediatrix.com/specialtyreview

Recruitment Ads: Pages 2 and 11

The Value of the RetCam in Neonatal Intensive Care Units

By Helen A. Mintz-Hittner, MD

Retinopathy of Prematurity (ROP) is the leading single cause of childhood blindness in both the industrialized and developing countries. Over the last decade, both the detection methods and the treatment protocols have evolved significantly. As the battle to combat this disease continues, technology such as the RetCam (Clarity Medical, Pleasanton, CA) is leading the charge. The RetCam is a fully-integrated wide-field digital imaging system capable of capturing ophthalmic images from the smallest premature infants to children. These images can then be directly transferred to a network, allowing viewing and analysis by experts anywhere in the world.

The Need for Detection in a Growing Patient Population

As with any disease, ROP has to be diagnosed in a timely fashion if there is any hope of treating it successfully. While this may not be an issue in the leading children's hospitals in industrialized countries, there are not enough ophthalmologists who specialize in ROP to cover the globe. Telemedicine will be used extensively in the future so that all remote areas of the United States and the world will have access to good ROP experts and second opinions. A shortage of skilled personnel who can use the indirect ophthalmoscope, along with financial constraints and malpractice issues, has led to a lack of screening and treatment programs in many parts of the world. This lack of screening programs combined with an increased survival rate among premature infants has generated a tremendous increase in the number of ROP cases worldwide.

> ***"Retinopathy of Prematurity (ROP) is the leading single cause of childhood blindness in both the industrialized and developing countries."***

Telemedicine ROP screening programs are demonstrating success in various countries. A telemedicine approach for ROP screening in Peru using non-physician obtained photos was validated as an effective method of identifying babies who require an examination by an ophthalmologist.[1] In India, highly-trained technicians use the RetCam to take wide-field digital fundus images of at-risk infants.[2] The technicians capture, process and store the photos, giving these families access to medical care that would not otherwise be available. Even in the United States, telemedicine screening programs such as SUNDROP in the San Francisco area are proving necessary and successful.[3] Nurses in neonatal care units in underserved areas are taught to capture infant retinal images and upload them to the network. These images are then analyzed by an ROP expert in California, and can be shared with consulting experts around the globe for a second opinion.

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"This form of objective photographic documentation has proven useful not only for objectively recording the research done in multi-center clinical trials such as BEAT-ROP, but also in validating and publishing the information."

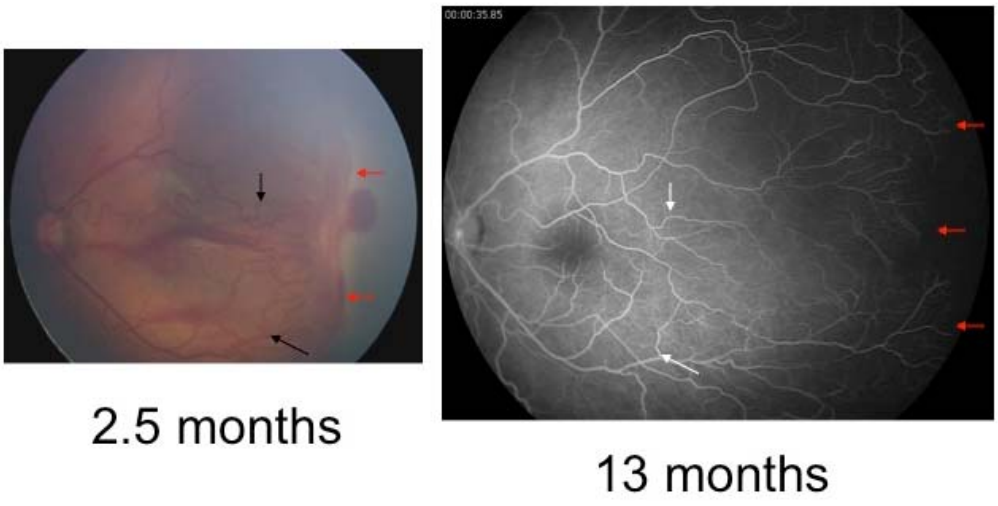
The Importance of Documentation

ROP has traditionally been detected with binocular indirect ophthalmoscopy performed at the patient's bedside by an ophthalmologist. While the quality and detail of what is observed via this method is undisputed, this type of examination drastically limits how this information can be recorded and shared. The digital images captured by a wide-field fundus camera allow documentation of all cases with precise comparisons of the same infant over time both prior to and following treatment if necessary. Storing these images for posterity facilitates comparisons with other cases, by other experts, and has important medico-legal implications. This enables understanding of each patient's disease progression, facilitates treatment decisions, and documents outcomes.

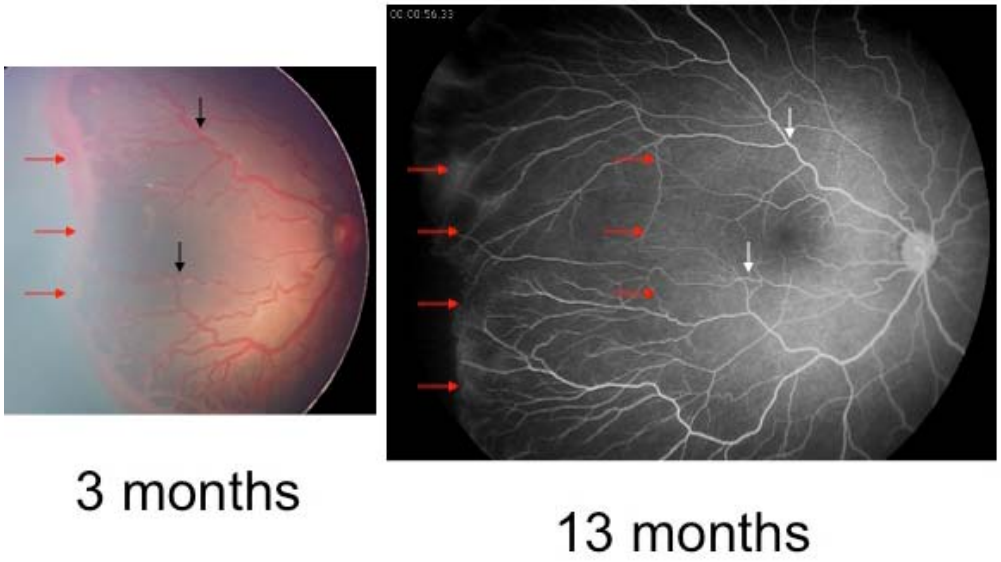
There are several important research studies being conducted worldwide in children, and use of a wide-field fundus camera has become an indispensable requirement. Previously, studies were conducted using retinal drawings which are less accurate than a photograph which captures objective details often not appreciated clinically while examining a moving infant. The wide-angle view allows you to get pictures of both the posterior and the peripheral retina, and renders objective evidence that can be reviewed in great detail. It really provides a far better method when conducting objective studies to establish evidence-based standards.

RetCam in BEAT-ROP

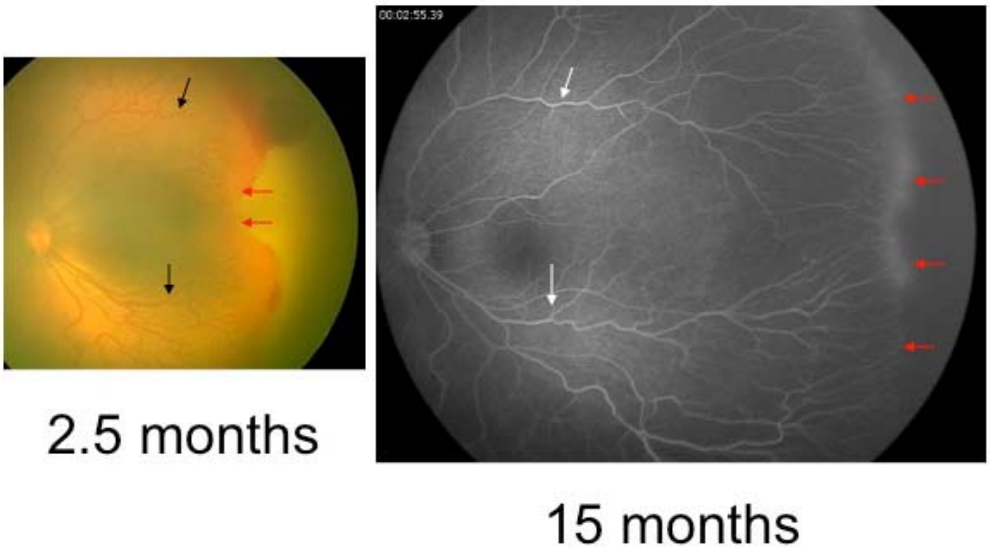
One current ROP clinical trial, which is led by me and is centered at the University of Texas Health Science Center in Houston, is Bevacizumab Eliminates the Angiogenic Threat of Retinopathy of Prematurity (BEAT-ROP). The purpose of BEAT-ROP is to determine whether: injections into the vitreous of an anti-vascular endothelial growth factor (VEGF) will reduce the incidence of blindness by suppressing the neovascular phase of ROP compared to a control group receiving conventional laser therapy; and to determine the safety and efficacy of intravitreal bevacizumab (IVB) in the treatment of ROP. With the US Food and Drug Administration approval of bevacizumab for the treatment of metastatic colorectal, lung, glioblastoma, breast and renal cancers and the recent use of anti-VEGF drugs for ocular diseases in adults, using this class of drugs in the treatment of neonates with ROP is now plausible. Obviously there is



Avastin: 775 gm; 25 wk at birth.



Avastin: 495; gm; 24 wk at birth.



Avastin: 550; gm; 22 wk at birth.

considerable concern regarding choice of drug, treatment protocol, the possibility of complications and, most importantly, the possibility that both acute and long-term systemic complications may be caused by anti-VEGF therapy.

There have been published examples of limited studies showing success in using anti-VEGF therapy for ROP both alone and in combination with laser.[4-6] BEAT-ROP is attempting to determine the potential benefits of less destructive therapy (IVB alone) that does not require intubation of the fragile premature infant or involve the common complications of laser therapy. At the same time, anti-VEGF therapy immediately halts the continued advance of the neovascularization of ROP due to VEGF already present in the vitreous. It also is available to patients too sick to undergo general anesthesia, or with pupils that dilate poorly, or with media opacities that make laser therapy impossible.

In this clinical trial, pre- and post- treatment RetCam evaluations are required, both in those treated by Laser and in those treated by IVB. RetCam photography is also employed to document regression of ROP or to establish the development of active ROP recurrence in eyes that initially had been treated successfully by laser or by IVB monotherapy for ROP Stage 3+. The RetCam is also used to obtain fluorescein angiograms to show either the loss of vessels in the peripheral retina following Laser treatment, or the continued growth of vessels into the peripheral retina following Avastin treatment.

While the preliminary results of this study are promising, without any early local or systemic complications, it has shown that IVB as monotherapy for ROP Stage 3+ is not uniformly successful in preventing recurrence. The use of the RetCam has been invaluable in this study and with continued follow-up of patients. This form of objective photographic documentation has proven useful not only for objectively recording the research done in multi-center clinical trials such as BEAT-ROP, but also in validating and publishing the information. Correspondence between professionals worldwide is facilitated by all parties being able to view the same images and share opinions, particularly with novel treatments such as that presented with BEAT-ROP.

Educating the Parents – A Picture is Worth a Thousand Words

The RetCam's ability to provide photographic images of the retina that can be shared, aids immeasurably in the education process. The stages of the disease and what is happening inside the eye are not only brought to life for nurses, residents and fellows, but are also made understandable to the parents so that they can participate in their child's care. Once they can see the disease progression, they are more easily able to understand ROP and develop a common language with their child's physician. With this improved, more objective way to communicate, parents become their child's greatest advocate.

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Global Neonatology Today: A Monthly Column by Dr. Dharmapuri Vidyasagar

By Dharmapuri Vidyasagar, MD, FAAP, FCCM

The "State of the Newborn" in the world today is both exhilarating and sobering. It is "exhilarating," because of the progress we have made in saving newborns during the last century. We have dropped IMR from 100/1000 live births, in the beginning of 20th century, to a low IMR of 5/1000 live births by 1999. And now we are debating whether we have reached the limits of viability beyond 22 weeks of life. These are considered to be the major public health achievements of the 20th Century. But unfortunately, the gains are limited to developed countries.

It is "sobering" because 95% of the global newborns do not yet have access to basic newborn care. Of the 130 million births a year, four million do not live past the first four weeks. Many do not go beyond their first breath! This is translated to 25,000 neonatal deaths a day per year. For comparison, these numbers are equivalent to: a tsunami occurring every week, a major earthquake killing 25,000 people, or the casualties of Iraq war ten fold! Mothers do not fare well either. Six hundred thousand (600,000) women die annually due to pregnancy related causes. That is 1,500 maternal deaths a day per year. In spite of these colossal problems, there is muted response by the public, policy makers and politicians, and the media. Why, we may ask ourself.

First, it is because 90% of these deaths occur silently in the numberless homes in the faceless villages in the far corners of underdeveloped and least developed countries with limited resources.

Second, newborns are literally voiceless, because their mothers are economically and politically deprived of their basic rights to seek health care.

Third, public officials in the affected countries are either insensitive, or do not have the resources to meet the health care needs of women and children.

"...95% of the global newborns do not yet have access to basic newborn care. Of the 130 million births a year, four million do not live past the first four weeks. Many do not go beyond their first breath! This is translated to 25,000 neonatal deaths a day per year. For comparison, these numbers are equivalent to: a tsunami occurring every week, a major earthquake killing 25,000 people, or the casualties of Iraq war ten fold!"

Fourth, there is a lack of awareness among the public, and a lack of understanding of the depth and breadth of the problem among health professionals.

Fifth, there is a lack of political and economic commitment of policy makers in the developing countries towards improving the maternal and newborn care.

What can be done?

Four million newborn deaths that occur every year are not from unknown epidemics, nor from a incurable malignancy. They are mostly preventable causes such as birth asphyxia, hypothermia and infections. In developed countries (US, Canada, Europe, Australia and Japan), we have made major strides in this regard. But that has impacted ONLY 5-10% of global newborns. The problem ahead lies in translating our past gains in science and technology to help the rest of the 90% of global newborns. This is the challenge of the day!

More on the subject in the coming issues. Stay tuned.

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To search for articles written by Dr. Vidyasagar via PubMed, go to: http://bit.ly/4wqZOo

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99nicu - a Web-based Platform for Neonatal Medicine

By Stefan Johansson, MD, PhD; Habib Alam Raza, MBBS, MD; Selvan Rathinasamy, MD; Hesham Abdel-Hady, MD

Medical science and the art of practicing medicine are gradually changing. Therefore, the transfer of new information is essential not only for undergraduate and postgraduate medical studies, but also for practicing medical specialists.

The Internet was originally developed for communication, and it was evident years ago that Internet was changing focus, from the provider to the user of information. Traditional homepages with less dynamic contents were challenged by web sites that were user-driven and interactive, a development often referred to as the evolution of "Web 2.0."

In 2005, we discussed how to use such technology for a web-based platform where professionals in neonatal medicine could interact. We simply thought that neonatal staff could benefit from sharing knowledge and experience regardless of place and time on earth, using the Internet. In May 2006, the *99nicu* web community (www.99nicu.org) was officially opened.

99nicu has been open for three years. More than 2300 people are registered members, but with the current number of monthly membership registrations, we foresee more than 3000 members in 2010. The majority of members work in the US and Europe, but *99nicu* is a truly international community. During 2008, visitors to the *99nicu* web site came from more than 100 different countries.

Since the start, so-called discussion forums are the key feature of the *99nicu* community, with hundreds of topics started in the various forums. Over the three years, we have also added several other features, such as: a Virtual NICU, an Image Library, Blogs, a Message Board for courses and conferences, and a section where members can submit reviews of medical literature and equipment. Recently, we opened a *99nicu* channel at Youtube.com, where members (after appropriate consent, etc.) can share educational videos.

In addition to the *99nicu* community, we also launched the web site, *Neonatal Staff*, (www.neonatalstaff.com) in 2008, an independent and non-commercial job board. At *NeonatalStaff*, providers of neonatal care can post job adverts and those seeking a new job can also post job requests for free.

Originally started by a Swedish group of neonatologists, today *99nicu* is run by an international team, with "virtual offices" in Sweden, Saudi Arabia, India and Egypt.

Ever since the start, our higher goal has been to create a powerful resource which can help neonatal staff to solve problems, share new insights and to create useful professional networks. A cornerstone of the whole project is to keep all features free of charge, not to discriminate against staff in developing countries. The "*99nicu* team" works on a voluntary basis, and expenses for web hosting and technical maintenance are covered by a small income from a few advertising companies and a handful of supporting members.

Most of the content at *99nicu* is created by our members, and as a consequence, the future of *99nicu* is held in the hands of our members. But, we feel confident that *99nicu*, despite the lack of funding for marketing, will continue to develop into a full-fledged Internet community for neonatal staff, for the good of newborn infants around the world. As the team backstage, we will also do our best to further implement new ideas into the *99nicu* community. Two projects that we are currently discussing are a Wiki about neonatal medicine, and a conference in evidence-based neonatology.

Through the combined efforts of interested, enthusiastic and informed neonatologists around the world, we are eager to spread our wings and disseminate our collective knowledge. This is the goal which *99nicu* is aiming to achieve.

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Thread / Thread Starter	Last Post	Replies	Views
Sticky: About for the Virtual NICU - read this before admitting a patient! Stefan Johansson	15th February 2008 17:17 by Stefan Johansson	0	315
ichthyosis in newborn Elena Baibarina	4th October 2009 23:58 by tricorniorojo	10	470
Severe sepsis with pleuritis,meningitis in VLBW baby Anna Moscow	18th September 2009 14:09 by Anna Moscow	20	398
L&D managment of hydropes ATEFSHAFEI	17th September 2009 15:15 by nehad_nasef	3	56
Term infant, generalized edema at 4 weeks of age. Stefan Johansson	25th August 2009 14:01 by dozeneggs	18	708
De Novo transloation Trisomy 21 ATEFSHAFEI	24th August 2009 22:26 by JACK	1	40
Refractory apnea of prematurity drmangalabharathi@gmail.com	10th August 2009 05:16 by drjha04	11	206
cholestatic jaundice and icthyosis ATEFSHAFEI	21st July 2009 00:40 by LeighAnn	3	114
newborn with rockerbotttom feet and scoliosis selvanr4	15th July 2009 10:52 by selvanr4	3	96
Big hemangioma Gonzalo Ares	14th July 2009 15:58 by clemens.andree	1	82

Screen-shot from a "thread" on 99nicu.

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Landmark Study Sheds New Light on Human Chromosomal Birth Defects

Newswise — Using yeast genetics and a novel scheme to selectively remove a single protein from the cell division process called meiosis, a cell biologist at The Florida State University found that when a key molecular player known as Pds5 goes missing, chromosomes fail to segregate and pair up properly, and birth defects such as Down Syndrome can result.

That discovery is groundbreaking, but so, too, is what principal investigator Hong-Guo Yu calls the "genetics trick" performed by his research team that made the discovery possible. The study shines new light on the protein Pds5, its crucial regulatory role during meiosis, and the impact of its absence on the molecular-level genesis of human chromosomal birth defects that include Down, Edwards, Patau, Turner, Klinefelter's and XYY syndromes.

The findings, which are described in a paper ("Pds5 is required for homologue pairing and inhibits synapsis of sister chromatids during yeast meiosis") featured in the September 7, 2009 *Journal of Cell Biology*, may contribute to the eventual development of targeted, molecular-level interventions.

Yu, an Assistant Professor in FSU's Department of Biological Science, explained how the meiotic stage is set and what goes wrong when key elements are rearranged.

"To produce a genetically balanced gamete (sperm and egg), the cell must contend with two sets of chromosome pairs, homologs and sisters," he said. "Homologs are the nearly identical chromosomes inherited from each parent; sisters are exactly identical pairs that are produced like photocopies as part of normal cell division."

"During normal meiosis, the process of division that halves the number of chromosomes per cell, my colleagues and I discovered that Pds5 regulates the pairing and synapsis (joining together) of 'mom and dad' homologs. We also learned that Pds5 plays a vital role in the synaptonemal complex, a glue-like protein structure that homologs use to literally stick together as they pair up. In addition, we found that, although sister chromatids enter meiosis in very close proximity to one another, Pds5 acts to inhibit synapsis between them, a good thing because, then, meiotic conditions support the necessary pairing of homologs."

Consequently, removing Pds5 during meiosis triggers a chromosomal catastrophe.

"In order to observe what happened when the Pds5 went missing from the process, we performed a 'molecular genetics trick' that had never been applied to this particular protein before, and it worked," Yu said. "We successfully engineered yeast cells that shut down Pds5 only during meiosis, but not when they were vegetative."

As a result, Pds5 was no longer present to regulate homolog organization and transmission in the meiotic yeast cells. The synaptonemal complex, which normally would support the synapsis of homologs by creating a sticky bond along their entire length, failed to form. In the meiotic malfunction that followed, the identical sister chromosomes began to synapse instead.

"When Pds5 is removed and sister chromatids become synapsed as a result, the segregation and recombination of homologs essential for genetic diversity fails," Yu said. "This finding is highly important, because failure to generate a crossover between homologs leads to chromosome missegregation and can cause human chromosomal birth defects such as Down syndrome, which affects about one in 800 newborns in the United States."

Yu said the landmark study has significantly extended previous observations of the role of Pds5 in the formation of meiotic chromosome structure.

"Now, we are investigating the other factors that interact with Pds5 during meiosis to regulate chromosome segregation and homolog synapsis," he said. "Long term, we hope to achieve a comprehensive understanding of the molecular mechanisms behind chromosomal birth defects and see our research contribute to the creation of targeted interventions during meiosis."

Currently, Yu's research at Florida State University is supported by a two-year, $150,000 Basil O'Connor Starter Scholar award from the March of Dimes Foundation, and by a three-year, $375,000 Bankhead Coley grant from the Florida Biomedical Research Program.

The paper was co-authored by Hui Jin, a research technician in biology at Florida State, and Vincent Guacci, a postdoctoral assistant in the Department of Embryology at the Carnegie Institution of Washington.

Maternal HAART Minimizes the Risk of Postnatal HIV Transmission

Newswise — Researchers conducting clinical trials in Rwanda have concluded that the risk of postnatal transmission is minimal in HIV-positive mothers undergoing highly active antiretroviral therapy (HAART) while breastfeeding. The results of the trials have been published in the current issue of *AIDS*, the leading journal in the field of HIV and AIDS research. The journal is published by Lippincott Williams & Wilkins, a part of Wolters Kluwer Health, a leading provider of information and business intelligence for students, professionals, and institutions in medicine, nursing, allied health, and pharmacy.

Although formula feeding has been the recommended strategy for preventing postnatal HIV transmission in developed countries for many years, researchers have recognized that this intervention is not feasible for many women in resource-limited settings. Despite this, there had until now been no single study conducted which formally compared maternal breastfeeding with HAART with formula feeding within the same cohort in resource-limited countries.

Dr. Cécile Alexandra Peltier, together with her colleagues, conducted their study with the aim of assessing the 9-month HIV-free survival of children with two strategies to prevent HIV mother-to-child transmission. Women participating in the cohort study could choose the mode of feeding for their infant: breastfeeding with maternal HAART for six months, or formula feeding. All received HAART from 28 weeks of gestation.

Of the 227 infants who were breastfed during the trial, only one became infected with HIV, corresponding to a 9-month cumulative risk of postnatal infection of 0.5% in the breastfeeding group. Moreover, the overall mortality rate of the infants involved in the study was significantly higher in the formula-fed group (5.6%) than in the breastfed group (3.3%).

The results of the study have led researchers to conclude that maternal HAART while breastfeeding could be a promising alternative strategy in resource-limited settings. A key implication of this study is that women can be offered a choice in infant-feeding options, both of which could be safe and effective, given regular postnatal follow-up and counseling.

More Infants Surviving Pre-Term Births Results in Higher Rates of Eye Problems

As more extremely pre-term infants survive in Sweden, an increasing number of babies are experiencing vision problems caused by abnormalities involving the retina, according to a report in the October 2009 issue of *Archives of Ophthalmology*, a JAMA/Archives journal.

"Retinopathy of Prematurity (ROP) [abnormal development of blood vessels in the retina] remains an important cause of childhood blindness and visual impairment throughout the world," the authors write as background information in the article. "During the last decade, neonatal care has changed with an increase in centralization, implementation of new therapies and provision of intensive care for infants of extremely low gestational age. These changes have contributed to an increasing population of survivors in neonatal intensive care units today.

The incidence of retinopathy of prematurity in these extremely preterm infants is, therefore, unknown."

Dordi Austeng, MD, of University Hospital, Uppsala, Sweden, and Trondheim University Hospital, Trondheim, Norway, and colleagues studied Swedish infants born before 27 weeks, gestation between 2004 and 2007. Infants were screened for retinopathy of prematurity beginning at five weeks after birth and were treated for the condition according to established guidelines.

During the study, 506 of 707 infants survived until the first eye examination. Of these, 368 (72.7%) had retinopathy of prematurity, including 37.9% with mild cases and 34.8% whose condition was severe. A total of 99 (19.%) were treated.

Gestational age was more closely associated with the development of retinopathy of prematurity than was birth weight. "The incidence was reduced from 100% in the five infants born at 22 weeks, gestation to 56% in those born at 26 completed weeks," the authors write. "In addition, the risk of retinopathy of prematurity declined by 50% for each week of gestational age at birth in the cohort."

Direct comparisons with previous studies are difficult, but most have found much lower incidences of severe retinopathy of prematurity, the authors note. For instance, a Belgian study reported a 25.5% incidence among infants born before 27 weeks, gestation and an Austrian study observed a 16% lower rate, compared with the 34.8% incidence in the current findings.

"The higher incidence of retinopathy of prematurity in the present study may be because of the higher proportion of infants born in the earliest weeks of gestation (i.e., 11.5% of infants in weeks 22 to 23 vs. 0% to 6% in the other studies)," the authors write. "These extremely premature infants, who previously did not survive, are probably especially vulnerable and prone to develop complications such as retinopathy of prematurity."

This study was supported by the Birgit and Sven Håkan Olsson Foundation, the Evy and Gunnar Sandberg Foundation, Kronprinsessan Margarethas Arbetsnämnd för synskadade, the Norwegian Association of the Blind and Partially Sighted, Stiftelsen Solstickan and the Swedish Association of the Visually Impaired.

Registry to Track Children with Infantile Spasms

Newswise — Researchers have launched an online registry that ultimately aims to help children with a severe type of epilepsy that strikes in the first months of life. It is believed to be the first worldwide registry of children with infantile spasms and is a collaboration between Washington University School of Medicine in St. Louis and the University of Chicago.

Researchers plan to use the registry to look for similarities among children with the disorder to help lead to improved treatments, said Alexander Paciorkowski, MD, Instructor of Neurology and Medical geneticist at the School of Medicine and a staff physician at St. Louis Children's Hospital.

Although the condition was first described in the 1840s, physicians and researchers still have many questions about possible causes and effective treatments.

"We need to learn more about infantile spasms, such as why some babies respond well to an injected hormone treatment and others don't, which medications are most effective in stopping spasms, what tests can help doctors decide which medication to use first and why some babies with Down Syndrome develop infantile spasms and some do not," Paciorkowski said. "We believe that the data from this registry and genetic studies will help answer some of those questions."

Infantile spasms, or West Syndrome, is a seizure disorder that begins before age 2, and accounts for about 25% of epilepsy diagnoses in babies under 12 months old. An infant's body will suddenly bend forward, resembling sit-ups. The infant may bend his or her arms and legs inward or throw them outward. The seizures occur often upon waking and may occur in clusters of up to 100 spasms at a time. The spasms can have a devastating impact on the baby's development, causing difficulty learning how to sit, crawl, walk and talk. The spasms are often replaced with another seizure disorder as children age. Physicians say early diagnosis and treatment provide for the best outcomes.

Paciorkowski developed the registry, at infantilespasms.wustl.edu, with Christina Gurnett, MD, PhD, Assistant Professor of Neurology, of Pediatrics and of Orthopedic Surgery at the School of Medicine; Liu Lin Thio, MD, PhD, Assistant Professor of Neurology, of Pediatrics and of Anatomy and Neurobiology at the School of Medicine and Director of the Pediatric Epilepsy Center at St. Louis Children's Hospital; and William B. Dobyns, MD, Professor of Human Genetics, of Neurology and of Pediatrics at the University of Chicago Medical Center.

In addition to collecting data through the registry, the researchers plan to ask parents to volunteer DNA samples from their children with the disorder to look for genes that might be playing a role.

"Currently, we know about a few genes, but there are probably more," Paciorkowski said. "If we are able to identify the genes that cause infantile spasms, we hope to develop better medicines to help stop them."

The traditional treatment for infantile spasms is an injected hormone called adrenocorticotropic hormone (ACTH), which has the potential for serious side effects, such as high blood pressure, infections, bleeding, weight gain, irritability and problems sleeping. Treatments also can include other anti-seizure medications or a medically supervised high-fat, low-carbohydrate diet, known as a ketogenic diet.

Parents of children who were diagnosed with infantile spasms prior to age 2 may register their child at no cost. Before entering the registry, children also should have had some previous studies, such as a video EEG and a brain MRI.

Once registered, parents will complete several questionnaires about the child's birth, medical and seizure history, family medical history, hospitalizations and development. The child's referring physician will also be asked to complete several questionnaires about the child's medical history and information specific to the diagnosis.

Paciorkowski has taken a keen interest in infantile spasms since he was a medical student in the late 1990s and admitted a patient with the disorder.

"I remember the conversations with the neurologists about treatment because we weren't sure which medicines would be helpful," Paciorkowski said. "Fast forward to now, when we admit a child with infantile spasms to St. Louis Children's Hospital, we can review the literature about treatments, but I'm amazed at the number of questions still unanswered."

Paciorkowski said this registry is different from other studies because it gets parents and their children's physicians involved.

"Parents often have very detailed information about their child's history and health," he said. "We have made the registry very parent-friendly and parent-focused."

MRI Helps Detect Life-threatening Pregnancy Complication

A study presented at the annual meeting of the Radiological Society of North America (RSNA) revealed that MRI is a highly accurate means of identifying placenta accreta, a potentially life-threatening and increasingly common condition that is the leading cause of death for women just before and after giving birth.

"Due to the increase in cesarean sections and other surgeries that leave scarring on the uterine wall, coupled with women giving birth later in life, the incidence of accreta has increased dramatically over the past 20 years," said lead researcher Reena Malhotra, MD, a radiologist at the University of California, San Diego.

Placenta accreta, in which the placenta surrounding a fetus attaches too deeply to a woman's uterus, is most dangerous when the condition is not detected until the time of delivery. When a placenta that is deeply attached to the uterus is delivered along with a baby, it pulls with it parts of the blood-rich uterine wall, rupturing blood vessels that can lead to severe hemorrhaging in the mother, as well as complications for the baby. Severe cases, particularly when undiagnosed, may lead to massive hemorrhage requiring blood transfusion, hysterectomy or death of the mother.

While routine prenatal ultrasound is often able to identify the presence of placenta accreta, it is not always able to definitively diagnose subtle cases.

To evaluate the accuracy of MRI in diagnosing placenta accreta, 108 patients underwent MRI evaluation at UCSD between 1992 and 2009. The women were referred for MRI based on a suspicious prenatal ultrasound, clinical examination or significant risk factors for the condition. Risk factors for placenta accreta include placenta previa (placenta covers all or part of the cervix), uterine scarring, prior cesarean births and, in some cases, pregnancies after the age of 35.

The researchers were able to compare the MR images with surgical and/or pathology results in 71 of 108 cases. When correlated with surgical and pathology findings, MRI had a 90.1% accuracy rate in detecting the presence of accreta. MRI does not expose the mother or fetus to ionizing radiation.

"Our findings demonstrate that MRI is an extremely useful adjunct to ultrasound for assessing this potentially life-threatening obstetric condition," Dr. Malhotra said.

A 2005 study appearing in the *American Journal of Obstetrics and Gynecology* analyzed data from 64,359 births over 20 years (1982 – 2002) and reported an overall incidence of placenta accreta of one in every 533 deliveries. Women who have previously delivered a baby through a cesarean section have a greater risk for the condition by a factor of three. The risk escalates with each subsequent cesarean section. According to the latest data available from the Centers for Disease Control and Prevention and the National Center for Health Statistics, cesarean deliveries accounted for 31% of all US births in 2006, an increase of 50% since 1996.

Once placenta accreta is diagnosed, a pregnancy is considered high risk, and specialists will carefully monitor a woman's prenatal care and delivery.

"Having placenta accreta is not necessarily a bad prognostic indicator for the pregnancy," Dr. Malhotra said. "It is not knowing about the condition that is potentially life threatening. Accreta needs to be diagnosed ahead of time so that delivery can be planned."

Coauthors are Lorene E. Romine, MD, Robert F. Mattrey, MD, and Michele A. Brown, MD.

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