OSN Retina

Ophthalmologists hold ROP diagnosis in the palm of their hand

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Physicians at Narayana Nethralaya Postgraduate Institute of Ophthalmology in Bangalore are using their iPhones in a pilot program to screen infants in rural and semi-urban areas for retinopathy of prematurity.

The institute, active in pediatric community outreach programs for more than 25 years, partnered with i2i TeleSolutions to develop telemedicine software that can be downloaded to the iPhone. The application is the latest evolution of an innovative teleopthalmology program that is considered a model for health care delivery in rural areas.

Retinopathy of prematurity is a major cause of blindness in infants in India. More than 8% of the 27 million births annually are premature and at risk for the disease. It is estimated that of 100 at-risk infants screened, 15% to 20% may require treatment for ROP. With fewer than 400 retinal surgeons in India and fewer than 20 medical centers that provide comprehensive ROP screening, infants with ROP in rural areas and villages often do not receive the timely treatment necessary to prevent irreversible blindness.

A new epidemic

In India, ROP is generally found in infants weighing less than 1,500 g. The disease usually presents within 3 to 4 weeks of birth. However, India is now facing an epidemic of ROP, characterized by the presence of ROP in relatively mature babies and babies with varying levels of neonatal care, Amar Agarwal, MS, FRC, FRCOphth, told *Ocular Surgery News* Asia-Pacific Edition.

“We have routine screening protocols in all tertiary pediatric hospitals. Newborn screening is also done through outreach programs in distant villages. Once the diagnosis of ROP is made, the baby is shifted to the tertiary eye hospital for early treatment,” he said.

ROP awareness initiatives and mass media communication emphasize the importance of early screening. “However, we do encounter patients with late presentations, especially from remote villages,” Dr. Agarwal said.

ROP does not present in an obvious way to the lay person, according to Manish Nagpal, MS, DO, FRCS, from the Retina Foundation in Gujarat. Parents may have a false sense of security that nothing is wrong with the eye, he said.

“ROP incidence is on the rise in India since babies are now surviving with very low birth weights. The problem with ROP is that usually the parents are so relieved to get a precious baby, and so the onus

falls on perseverance by the pediatrician and then eventually to the retina specialist to convince the parents to undergo a screening as well as eventual treatment," Dr. Nagpal said.

Remote screening

Narayana Nethralaya's tele-ROP program KIDROP (Karnataka Internet-Assisted Diagnosis of Retinopathy of Prematurity) began in 2007, with screening of premature infants in several districts in Karnataka. Using a Retcam Shuttle portable retinal camera (Clarity MSI), specially trained non-ophthalmologists take retinal images of infants in more remote and rural areas of the country. The images are stored and uploaded to a server at Narayana Nethralaya.

"These clinicians use a specially created algorithm of 'triage' to make up for the lack of experts in their village or town," said Anand Vinekar, MS, FRCS, FPVR, project coordinator for KIDROP and department head of pediatric retina and pediatric visual rehabilitation at the institute. Since the program began, more than 2,300 infants have been screened and about 257 have been treated for ROP.

The success of the project has been underscored by an initiative, in partnership with the National Rural Health Mission, to expand the project into more rural districts of the country. The institute will provide free ROP screening, reading, training and treatment, and the NRHM will fund the equipment and provide logistical support.

Diagnosis by iPhone

When the program was launched, physicians used slow software that stored and forwarded images rather than allowing for virtually real-time screening. According to Dr. Vinekar, the iPhone app makes screening much quicker because diagnosing physicians are more likely to have full-time access to their mobile phones than a computer.

"Since September 2009, with the help of i2i TeleSolutions, Narayana Nethralaya has developed a software that allows these images to be viewed on the cell phone of the expert, anywhere and at any time, without dependence on the Internet. This technology was voted as one of the 'Top Ten Medical Innovations' for 2009 by *India Today*," Dr. Vinekar said.

The iPhone version of the i2i CARE TeleOphthalmology software is a companion product to i2iCONNECT TeleServices. Technicians can now upload scanned retinal images onto a secure dedicated server at one of several medical centers. The software image compression technology provides full diagnostic image quality. A physician can then remotely access these highly detailed, side-by-side images with an iPhone. The physician can quickly diagnose and recommend treatment through a report, sent through the iPhone to the center, that is then given to the infant's family.

"The i2i team is proud that our CARE TeleOphthalmology software connects ROP specialists to premature infants in the farthest corners of India," Sham Banerji, CEO of i2i TeleSolutions, said on the company website. "What we would really like to do is enable access to scarce medical resources without the constraint of geography or economy." – *by Carey Cowles*

Reference:

- TeleOphthalmology: A Worldwide Epidemic of Eye Disease Driving the Need for TeleOphthalmology. i2i TeleSolutions website. http://www.i2itelesolutions.com/teleopth.html. Accessed April 22, 2010.

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