Symposium in Focus:

Towards Universal Infant Screening with The Aid of New Wide Angle Retinal Imaging Technology

by Claire Noonan

Delegates of the 31st Asia-Pacific Academy of Ophthalmology Congress (APAO 2016) gathered at the Grand Hyatt Taipei for a symposium on advances in pediatric ophthalmic imaging, hosted by Visunex Medical Systems (California, U.S.A.), where they heard from a group of experts about the latest developments.

Professor Darius Moshfeghi, M.D. and panel of experts discuss advances in retinal imaging technology

Professor Darius Moshfeghi, M.D., from Stanford University School of Medicine, USA, opened the session. He described how telemedicine has transitioned since the year 2000, and the role played by the Sundrop network, a community telemedicine initiative that began in 2007.

Benefits of mobile screening

Telemedicine screening has now become an acceptable and viable option, with ophthalmologists reading images much as a radiologist does, rather than doing a live evaluation. This can increase the availability of early screening.

Professor Moshfeghi spoke of the wish he shares with many ophthalmologists around the globe that newborn wide angle visual screening become universal and mandatory, the way early hearing screening is in many countries.

Professor Moshfeghi said that for a screening test to have a socioeconomic benefit, one of its characteristics should be that it targets a prevalent disease. Compared with a 1 in 300 to 500 rate of hearing deficits among newborns, the prevalence of visual defects of 1 in 70 clearly shows that newborn visual screening is warranted.

"It's not an original thought on my side," he said, noting that in some countries a screening program is already in place. "People have been doing it on the sly and not really talking about it."

An opportunity is provided with the millions of newborn examinations that are already being done in the USA every year. "For something that we're doing that often, we should have some sort of confidence that it's worthwhile," he pointed out.

The wide angle imaging results gleaned from data after seven years of Sundrop shows that screening is 100% sensitive and 99.8% specific. He compared this to the standard paediatric eye exam, which has a sensitivity of only 12.9% and 91.7% specificity, and a low rate of agreement between specialists as to their findings.

The quality of images is continuing to improve as the technology evolves. The cameras are expensive however, and all the hours they sit unused can waste valuable potential screening time.

The Panocam increases available screening opportunities by enabling mobile screening. The handpiece can be taken with the health professional who takes images that can later be synced, wirelessly, with the main unit. After syncing, the images can be viewed on the main unit, or anywhere with internet and a laptop.

Professor Moshfeghi has initiated the Global Universal Eye Screen testing (GUEST) study, which is examining data from an international cohort and aims to identify screening that could be done with the least training and the highest rate of agreement on results.

'What I really want to do is to find the cheapest screener that can identify whether disease is present or not.'

> Professor Chan says that in his opinion, imaging and indirect ophthalmoscopy are not exclusive, but rather synergistic: "Ophthalmoscopy can visualize things that imaging can't detect, and vice versa."

Imaging technology aids collaboration and training

Discussion moved to the panel and Professor R.V. Paul Chan, M.D., FACS, of the University of Illinois College of Medicine, USA, agreed that imaging facilitates optimal care in the way it enables ease of access to a second opinion.

"The imaging helps us communicate and really share expertise, and I think that's very helpful," he said.

Professor Moshfeghi agreed. "You can phone a friend, and that's very powerful."

Professor Chan says that in his opinion, imaging and indirect ophthalmoscopy are not exclusive, but rather synergistic.

"Ophthalmoscopy can visualize things that imaging can't detect, and vice versa," he added.

Professor Wei-Chi Wu, M.D., Ph.D., from Chang Gung Memorial Hospital, Taoyuan, Taiwan, has a RetCam at the hospital where he works but it is not yet being used in a telemedicine program. He points out the usefulness of imaging also extends to the ability to document and track progression.

Discussion turned to the importance of credentials and mentorship in learning to reliably perform pediatric evaluations.

Professor Chan commented on the lack of existing training during residency for doing retinopathy of prematurity (ROP) screening.

"There are major deficiencies in how we train," he said.

Creating new systems to educate doctors can be facilitating using imaging and web based technology.

"One of the things we can do in this global community is this concept of telementoring. Now, we have the technology to support it," added Professor Chan.

On the other hand, Professor Wu commented on the usefulness of digital imaging as a teaching tool. With the aid of imaging, large groups of doctors can view the same case, whereas it would hardly be practical for 20 doctors to all perform ophthalmoscopy on the patient.

"It's impossible for all of us to do the examination. It's stressful for the babies."

Increased availability of imaging would aid in triaging cases, he added. Patients have been referred to him on an urgent bases who turn out to only have stage 1 or stage 2 ROP. Imaging could enhance communication between different parts of the medical team.

Future directions

Ray Hunt, director of Sales of Visunex, took the podium to inform delegates that although Visunex is a young company, they have a lot of expertise on board. He recognises the need to have not only reliable hardware, but also good software.

Ray Hunt outlined how the Panocam system could be used in a wide reaching screening program, with its mobile handpiece and wireless feedback of images. He assured delegates that the accompanying software is 'robust.'

Professor Moshfeghi said the handpiece is lightweight at between 500-600g. New lenses are being developed to also enable fluoroscein angiography and wide angle OCT.

"This will be very nice," he said.

"It's an exciting time to be in the pediatric imaging space," he added.

Professor Darius Moshfeghi, M.D., from Stanford University School of Medicine, USA

(Left) Professor R.V. Paul Chan, M.D., FACS, of the University of Illinois College of Medicine, USA

(Right) Professor Wei-Chi Wu, M.D., Ph.D., from Chang Gung Memorial Hospital, Taoyuan, Taiwan