INFANT TONOMETRY
Special consideration necessary in tonometry in very young children
by Roibeard O’hEineachain in Milan

Measuring IOP in infants can be a challenging task, requiring a consistent methodology and an assessment of the measurements that is in context with a patient’s entire clinical examination, according to Maurizio Uva MD, University of Catania, Italy.

“The difficulties in measuring tonometry in infants include the lack of cooperation on the part of the infant, the effects of anaesthesia on IOP and the changing thickness of the cornea as a child ages. Moreover, there is little data as to what is the normal IOP in an infant eye,” Dr Uva said at the Glaucoma Day session of the XXX Congress of the ESCR.

Dr Uva noted that results from a study carried out at Johns Hopkins University School of Medicine indicate that when infants are under sedation with ketamine their IOP will be closer to their IOP without sedation or anaesthesia than is the case when the anaesthetic gas sevoflurane is used (Blumberg et al, Am J Ophthalmol. 2007;143:494-499).

Research supports the use of the Tono-Pen® (Reichert) in paediatric cases, Dr Uva said. He cited a study that compared intraocular tonometry values with those obtained by three different non-invasive tonometers in children’s eyes. It showed that the Tono-pen measurements were closest to the intraocular values. The Schiötz tonometer tended to underestimate IOP, and the Perkins tonometer tended to overestimate IOP (Lasseck et al, Graefes Arch Clin Exp Ophthalmol. 2008;246:1463-1466).

The Icare® tonometer (Icare Finland Oy), which is designed for measurements to be taken at home without a doctor’s supervision, may also be a useful option, Dr Uva said. The new magnetic design in particular could provide advantages in paediatric patients because it allows measurements to be taken while the patient is in a supine position, he added.

He noted that in a study involving 71 eyes of 71 children with known or suspected glaucoma, IOP measured with the Icare tonometer was on average within 3.6 mmHg of measurements obtained with Goldmann applanation tonometry (Flemmons et al, J AAPOS. 2011 Apr;15(2):153-157).

Changes in corneal thickness as an infant’s eyes mature can also influence tonometry readings, Dr Uva said. He noted that in a study he and his associates conducted, newborns had a significantly higher IOP and corneal thickness than full-term newborns (Uva et al, J AAPOS 2011;15(4):367-9).

The findings of another study suggest that IOP increases during the first decade following birth. The study showed that mean IOP measured with a Perkins applanation tonometer is under 8.0 mmHg before age of three months and under 12.0 mmHg between ages of six and nine months and thereafter increases by about 1.0 mmHg per year up to 12 years (Bresson-Dumont, Journal Français d’Ophtalmologie; 32:176–181).

“The take-home message is to always include pachymetry in clinical examination, always use the same tonometer and, if possible the same anaesthesia,” Dr Uva concluded.

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