

Vision science highlights from the world's leading journals of medicine and science

Foldable CTR safe, effective

German researchers report promising results with a new foldable capsular tension ring system. The closed foldable capsular rings consist of eight hydrophobic and eight hydrophilic ring segments. It incorporates a sharp-edge design. The rings have a 9.2 mm minimum overall diameter. The researchers implanted the rings through a small (1.6 to 3.2 mm) incision after phacoemulsification in 104 eyes using cartridge systems or a two-folded technique with a forceps. No problems were seen with the ring during a six-month follow-up. No significant PCO occurred.

JCRS, HB Dick, "Closed foldable capsular rings", March 2005, Vol. 31, Issue 3, 467-471.

Brinzolamide drops vs. post-op IOP increases

Turkish researchers evaluated different post-cataract surgery IOP reduction strategies in a prospective randomized double-blind study of 60 eyes of 52 patients having phacoemulsification under topical anaesthesia. Patients received either receive oral acetazolamide 500 mg one hour preoperatively followed by 250 mg acetazolamide every six hours, one drop of brinzolamide 1% every 12 hours starting immediately after speculum removal, or no ocular hypotensive medication. Serial IOP measurements using a Perkins tonometer indicated that topical brinzolamide was as effective as oral acetazolamide in blunting the IOP elevation at four to six hours and was even more effective at 18 to 24 hours.

JCRS, V Dayanir, "Medical control of intraocular pressure after phacoemulsification", March 2005, Vol. 31, Issue 3, 484-488.

Shark alert

New techniques bring with them new complications. Dr Robert Osher describes three case reports of a new sign of thermal injury seen early in the learning curve with microincision phacoemulsification. Puzzling presentations led him to perform careful postoperative biomicroscopy with the slit beam, which revealed a lucency in the shape of a dorsal shark fin within the incision. The

curvilinear contour corresponds to the curve of the ultrasound needle. The "shark fin" sign represents focal shrinkage of tissue within the incisional tunnel, and its presence indicates a thermal cause. He advises that as small-incision cataract surgery continues to evolve and micro-phacoemulsification becomes more popular, surgeons should be aware of subtle evidence of thermal injury. If the shark fin sign is observed, he suggests further investigation of the technique and machine parameters.

JCRS, R Osher, "Shark fin: A new sign of thermal injury", March 2005, Vol. 31, Issue 3, 640-642.

Blinded by the light

Even moderate amounts of light can induce significant damage and retinal cell death, show studies conducted with dogs carrying a mutation in the rhodopsin gene. Mutations in this gene are known to be associated with retinitis pigmentosa. The researchers found that increasing amounts of light overwhelmed repair mechanisms and led to an acceleration of retinal degeneration. The highest light levels produce a complete loss of photoreceptors in less than four weeks. The authors caution that procedures that expose the retina to moderate amounts of light should not be used routinely in patients with rhodopsin mutations, and that retinal examinations should be as brief as possible to limit light exposure. They note that the research provides a platform to study mechanisms of neuronal injury, repair, compensation, and degeneration.

PNAS, A Cideciyan et al., "In vivo dynamics of retinal injury and repair in the rhodopsin mutant dog model of human retinitis pigmentosa", March 2005, 102: 5233-5238.

Antibiotic resistance in Europe

Resistance to antibiotics varies widely across Europe, a large-scale study confirms. Not coincidentally, the higher rates of resistance are associated with areas of higher antibiotic use. Researchers compared antibiotic use with antibiotic resistance rates in 26 European countries from the beginning of 1997 to the end of 2002. They expressed the data in defined daily dose per 1000

inhabitants daily (DID). The highest rate was in France (32.2 DID) and the lowest was in the Netherlands (10.0 DID). Antibiotic use was lower in northern, moderate in eastern and higher in southern regions. The researchers noted a trend of increased use of the newer broad-spectrum antibiotics and a decline in use of the older narrow spectrum agents. The researchers call for enhanced public health strategies to reduce inappropriate antibiotic use and resistance levels. Without effective strategies, the benefits of these agents will be lost, they warn.

Lancet, H Goossens, "Outpatient antibiotic use in Europe and association with resistance: a cross-national database study", Feb 2005, Volume 365, Issue 9459, 579-587.

Bionic eye progress

Stanford University researchers published a design of an optoelectronic retinal prosthesis system that can stimulate the retina with a pixel density of up to 2500 pix mm⁻², corresponding to a visual acuity of 20/80. The system includes a wallet-sized computer processor, a solar-powered battery implanted in the iris and a light-sensing chip implanted in the sub-retinal space. The chip is 3.0 millimetres wide and should permit the viewer to perceive 10 degrees of visual field at a time. An image from a video camera is projected by a goggle-mounted collimated infrared LED-LCD display onto the retina, activating an array of powered photodiodes in the retinal implant. The goggles are transparent to visible light, thus allowing for the simultaneous use of remaining natural vision along with prosthetic stimulation. Optical delivery of visual information to the implant allows for real-time image processing adjustable to retinal architecture, as well as flexible control of image processing algorithms and stimulation parameters. They are testing their system in rats, noting that human trials are at least three years away.

J. Neural Eng., D Palanker et al., "Design of a high-resolution optoelectronic retinal prosthesis", Feb 2005, 2, S105-S120.

Viagra warning

Clinical researchers at the University of Minnesota report a series of seven cases of permanent vision loss in patients who had taken the erectile dysfunction drug Viagra (sildenafil). The seven patients, aged between 50 and 69 years, had typical features of nonarteritic ischaemic optic neuropathy (NAION) within 36 hours of taking Viagra. All of the patients had at least one arteriosclerotic risk factor, including hypertension, diabetes, hypercholesterolemia, or hyperlipidemia. All of the patients also had a low cup to disk ratio. The researchers suggest that ophthalmologists should ask all men with NAION about the use of Viagra, and recommend that patients with a history of NAION in one eye be cautioned that Viagra may increase the risk of NAION in the fellow eye.

Journal of Neuro-ophthalmology, H Pomeranz, "Nonarteritic Ischemic Optic Neuropathy Developing Soon After Use of Sildenafil (Viagra): A Report of Seven New Cases", March 2005, Volume 25, Issue 1.