

Sonic phaco system may be less traumatic to the eye

Pippa Wysong
in Vancouver

THE Neosonix® handpiece, a component of the Inifiniti™ phaco system (Alcon) is living up to its promise of reducing phaco time and reducing corneal trauma, report Canadian researchers.

The researchers conducted a prospective study comparing the novel hybrid technology to treatment with conventional ultrasound in patients undergoing cataract surgery. They presented details of the study at the annual conference of the Canadian Ophthalmological Society.

"Neosonix is a hybrid technology based on a specialised hand-piece that combines both conventional linear ultrasound and low-frequency rotational oscillations of the hand-piece tip," explained Rickesh Sood MD, who is a masters student in epidemiology at Harvard School of Public Health.

He was part of a research team headed by Ike Ahmed MD, from the University of Toronto. The team did what is believed to be the first prospective study comparing the outcomes of patients treated with either Neosonix or

conventional ultrasound alone.

The study randomised 84 cataract surgery patients, with an average age of 74 years, to treatment with either ultrasound phacoemulsification plus Neosonix technology, or standard ultrasound treatment alone. There were 44 eyes and 40 eyes in the two groups respectively, and there were no differences in baseline characteristics.

Main outcome measures were total ultrasound time, average ultrasound power, effective phacoemulsification time, corneal oedema, and uncorrected visual acuity on post-operative day one.

Mean total ultrasound time in the Neosonix group was 55.2 seconds, compared with a mean of 63.8 seconds in the ultrasound only group. The mean effective phacoemulsification time was 7.83 seconds in the Neosonix group compared with 11.91 seconds for the ultrasound only. Neosonix also required less ultrasound power.

Statistically significant differences were also seen in patient findings on the first post-operative day. The proportion of eyes that had no corneal oedema was

92.4% in the Neosonix group, and 80.2% in the ultrasound group. As for uncorrected visual acuity of 20/40 or better, the proportions were 83.2% and 76.4% in the groups, respectively.

The reduction of ultrasound intraocularly has been shown to be associated with reduced negative clinical outcomes. Clinically, this is particularly important in people with pre-existing corneal dystrophies, said Dr. Sood.

An advantage of the Neosonix technology is that it allows the surgeon to simultaneously use both sonic and ultrasonic energy, at varying levels; or to choose a single modality and toggle between the two. This allows surgeons to reduce the amount of potentially harmful thermal energy that can come from exposure to too much high-frequency ultrasound, he explained.

"Corneal oedema caused by endothelial damage during cataract surgery has been shown to be related to the amount and duration of exposure to ultrasound energy," he said.

Another ophthalmologist who has used the technology is William Fishkind MD, who is based in

Tucson, Arizona but teaches at the University of Utah. He told *EuroTimes* he is not surprised by the findings in the Canadian study.

"In my own experience the Neosonix technology is a unique addition to the phaco armamentarium. It actually improves both the jackhammer and the cavitation effect," he said.

The device is most effective when emulsification is being performed on a nucleus that is held in place. It's effective during sculpting, and divide and conquer, or stop and chop techniques, he explained.

He cautioned that the system was less effective for fragments. In fragment removal, Neosonix can knock the fragment off the tip during the emulsification. On the other hand, cavitation energy is more pronounced and aids in cavitation of fragments.

"Since it makes both the sculpting and the fragment removal more efficient, you can almost bet that there is going to be less time spent during phaco, and less power going into the anterior segment. This means less potential damage to the blood aqueous barrier and less damage to the

endothelium," he said.

But while there are numerous advantages to the Neosonix device, Dr. Fishkind has opted not to use it in his own practice. He said that he finds the hand-piece is too heavy for his personal preference. "I do a lot of cases in the day and my hands get tired. To have a bigger, heavier hand-piece doesn't appear to be worth it to me," he said.

The Neosonix handpiece is designed to work with the Alcon Legacy and Inifiniti machines. The trimodal Inifiniti system offers surgeons the option of using ultrasound phacoemulsification alone, the combination of ultrasound and oscillation provided by the Neosonix handpiece, or the Aqualase® liquefaction tool.

rickesh.sood@learnlink.mcmaster.ca