Formula may help with post-LASIK IOP management

Dermot McGrath
in Rome

Mark Wevill MD told delegates that such information was determined from the laser calculations and the residual corneal thickness value was calculated by subtracting the laser ablation depth measurement from the preoperative pachymetry reading.

Dr Wevill said that the researchers were aware of certain inherent limitations with this approach.

“We acknowledge that this value is not a true postoperative pachymetry measurement, but this number is more relevant in a clinical setting because it is always available postoperatively whereas the measured postoperative pachymetry is not routinely done, especially by co-managing optometrists. Pachymetry is usually only done postoperatively if a re-treatment is planned. Therefore this calculated value is more useful but a less accurate value,” he said.

Of the 200 eyes included in the study, the mean preoperative IOP was 15.3 mmHg compared to an average of 9.8 mmHg postoperatively, with a mean IOP change of 5.5 mmHg said Dr Wevill.

He pointed out that a study by Duch et al published in the Journal of Glaucoma in 2001 showed that non-contact tonometry is more accurate than Goldmann applanation tonometry (GAT) after LASIK, because GAT underestimates the IOP.

“Correlations between preoperative IOP and postoperative variables were assessed and the most significant correlations were between preoperative IOP and postoperative IOP with mean curvature change and residual cornea. There were other correlations, however, these three were the strongest,” he said.

Simple formula more useful

Dr Wevill said that while other weaker correlating factors would increase the confidence level of the derived formula, they would also serve to make the formula less “user-friendly” in a clinical setting.

“In other words, we found that a relatively simple formula can be produced which is reasonably accurate for predicting postoperative IOP from the preoperative IOP and other parameters. In essence the formula that was derived is that preoperative IOP is related to postoperative IOP, mean curvature change and postoperative corneal thickness minus a factor of 7.3,” he said.

The authors said that limitations of the study include the fact that preoperative corneal thickness was measured by pachymetry, which does not necessarily determine the thinnest part of the cornea. Also residual corneal thickness was calculated rather than measured.

Dr Wevill also noted that most tonometers function on the basis that the external force against a sphere is related to the pressure inside the sphere.

“We therefore thought it would be useful for ophthalmologists and optometrists who are managing these patients to be able to correlate the changes in ocular parameters with the apparent change in IOP measured with non-contact tonometry, so the diagnosis and management of the glaucoma is not compromised,” he said.

Dr Wevill’s retrospective study included 200 sequential eyes with myopia with or without astigmatism that underwent LASIK using an Alcon LaserVision 4000 excimer laser and a Hansatome microkeratome. The patients’ mean spherical equivalent was –4.25 D.

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Dr Wevill reiterated that the effect of LASIK on IOP could be predicted with a reasonable degree of accuracy with data that is readily available to clinicians.

“We hope that this information may well be of use in the future management of glaucoma patients who have undergone LASIK,” he said.

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