

Effects of accelerated corneal crosslinking on the topographic parameters of patients with progressive keratoconus

Avaliação dos parâmetros topográficos antes e após o crosslinking acelerado da córnea em ceratocone progressivo

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Dear Editor,

We read with great interest the article by Uzel et al.⁽¹⁾, where the authors evaluated changes in corneal biomechanical properties after accelerated corneal crosslinking (CXL) using ocular response analyzer waveform derived parameters.

We have some comments on the execution of this remarkable study.

While ultrasound pachymetry is the gold standard for evaluating corneal thickness (CT), it has several limitations, such as the lack of an exact axial placement site for the probe at the corneal center and the fact that measurement reproducibility is low due to differing examiners' skills and the influences of different anesthetic drops during follow up examinations.

Moreover, the corneal water content may alter ultrasound pachymetric measurements, as it does in cases of corneal edema or corneal stiffness, because the sound speed is lower in edematous tissues (enlarging measurements) and higher in stiff tissues (reducing their size).

For these reasons, other devices have been tested to achieve reliable measurements⁽²⁾.

Thus, we believe a Pentacam was a good choice for measuring topographic parameters. The Pentacam can measure not only the central and thinnest CT, but also the corneal volume. However, we wondered why

the authors did not include this last parameter in their evaluations given its sensitivity for assessing potential keratoconus progression. Indeed, ecstasies and thinning may involve corneal regions different from the central and thinnest one, and they may be disregarded if only the central or thinnest CT is appraised.

In addition, according to the published results, the astigmatic correction was evaluated without considering potential astigmatic axis changes. Proper astigmatic correction estimation requires assessment of astigmatic axis changes. A cylindrical correction misalignment will result in a fake astigmatic under correction with a spherical change, and methods to identify such influence exist⁽³⁾.

Finally, the authors included 50 eyes from 45 patients in their study. From this number, both eyes in some patients were considered, while only one eye was evaluated in the others. Given the small number of eyes, a bias may have been introduced, reducing the power of the study^(4,5).

REFERENCES

1. Uzel MM, Koc M, Can C, Polat S, Yilmazbaş P, Ileri D. Effect of accelerated corneal crosslinking on ocular response analyzer waveform-derived parameters in progressive keratoconus. *Arq Bras Oftalmol.* 2019;82(1):18-24.
2. De Bernardo M, Borrelli M, Mariniello M, Lanza M, Rosa N. Pentacam vs SP3000P specular microscopy in measuring corneal thickness. *Cont Lens Anterior Eye.* 2015;38(1):21-7.
3. Rosa N, De Bernardo M, Romano MR, Scarfato G, Verdoliva F, Mastropasqua R, et al. Analysis of photoastigmatic keratectomy with the cross-cylinder ablation. *Indian J Ophthalmol.* 2012;60(4):283-7.
4. De Bernardo M, Zeppa L, Forte R, Cennamo M, Caliendo L, Zeppa L, et al. Can we use the fellow eye biometric data to predict IOL power? *Semin Ophthalmol.* 2017;32(3):363-70.
5. Rosa N, De Bernardo M, Iaccarino S, Cennamo M. Intraocular lens power calculation: a challenging case. *Optom Vis Sci.* 2014;91(2):e29-31.

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