CLINICAL AND EXPERIMENTAL
OPTOMETRY

Letter to the editor

Clin Exp Optom 2014; 97: 280

Re: Silicone hydrogel mini-scleral contact lenses in early stage after corneal collagen cross-linking for keratoconus: a retrospective case series

Adrian Bruce

Australian College of Optometry, Carlton, Victoria, Australia
and Department of Optometry and Vision Sciences, the University of Melbourne, Parkville, Victoria, Australia
E-mail: abruce@aco.org.au
DOI:10.1111/cxo.12146

Editor: Severinsky, Wajnsztajn and Frucht-Pery[1] assessed the success of low oxygen transmissibility (Dk/t) lenses in correcting keratoconus after corneal collagen cross-linking. It is unclear from their article why they would pursue this strategy, when there is a wealth of modern contact lens materials available, which offer high Dk/t tolerance to different lens designs, lens power profiles or even patient non-compliance in the form of occasional overnight wear.

The original Holden-Mertz criterion determined that a critical Dk/t value of 24 is required for a lens worn under open-eye conditions to induce zero lens-induced corneal swelling.[2] The lenses fitted by the authors were less than half this value.

Studies subsequent[3,4] to that of Holden and Mertz[2] have reinforced the need for high Dk materials for daily wear, particularly for high-powered lenses and astigmatic designs.[5,6] Almost half of all documented contact lens complications relate to hypoxia.[7,8]

We are fortunate to have an innovative contact lens industry which has shown great leadership with the continual introduction of new high Dk/t lenses, including more recently the miniscleral rigid lenses and the extended range (XR) monthly disposable silicone-hydrogel lenses. Indeed, the proof of the science and research is being demonstrated in current clinical practice. Recent surveys of the contact lens industry have shown that the fitting of modern high Dk/t lenses now exceeds that of the old low Dk lens types.[9]

REFERENCES

1. Severinsky B, Wajnsztajn D, Frucht-Pery J. Silicone hydrogel mini-scleral contact lenses in early stage after corneal collagen cross-linking for keratoconus: a retrospective case series. *Clin Exp Optom* 2013: 96: 542–546.
2. Holden BA, Mertz G. Critical oxygen levels to avoid corneal edema for daily and extended wear contact lenses. *Invest Ophthalmol Vis Sci* 1984; 25:1161–1167.
3. Benjamin WJ. Downsizing of Dk and Dk/L: the difficulty in using hPa instead of mmHg. *Int Contact Lens Clin* 1996; 23: 188–189.
4. Papas E. On the relationship between soft contact lens oxygen transmissibility and induced limbal hyperaemia. *Exp Eye Res* 1998; 67: 125–131.
5. Bruce AS. Local oxygen transmissibility of disposable contact lenses. *Contact Lens Anterior Eye* 2003; 26: 189–196.
6. Fonn D, Bruce AS. A review of the Holden-Mertz criteria for critical oxygen transmission. *Eye Contact Lens* 2005; 31: 247–251.
7. Bruce AS, Brennan NA. Corneal pathophysiology with contact lenses. *Surv Ophthalmol* 1990: 35: 25–58.
8. Efron N. Contact Lens Complications, 3rd ed. St Louis, Missouri: Elsevier Saunders, 2012.
9. Efron N, Morgan PB, Woods, CA. Trends in Australian contact lens prescribing during the first decade of the 21st Century (2000–2009). *Clin Exp Optom* 2010; 93: 4: 243–252.