

## Guest editorial

### **Keratoconus: it is time to shake off old habits!**

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A little more than a decade ago, the therapy of keratoconus was a waiting game: the typically young patient would over the years progress from needing spectacles to contact lenses. Many, a decade or two after diagnosis and progression of their disease, would then face a desperate need for keratoplasty to restore the diminishing vision. After all, spectacles, contact glasses or intracorneal rings do help to improve vision, but *do not stop* the progression of keratoconus.

And keratoplasty, as most of us are aware, is not without its ensuing problems: it neither solves visual challenges in each and every patient, nor do its advantages last a lifetime. Keratoplasty, while quite successful in its various forms, remains an imperfect and often time-limited solution even with access to ample resources.

The published data suggest that the magnitude of the problem of keratoconus is significant in various geographical areas. According to a population-based study from Iran, the prevalence of keratoconus in the population group of 40 to 64 years was found to be 0.72 % and 0.79 % in men and women respectively (Hashemi H et al, 2013). In a hospital-based study from Nepal, 7 % of all patients requiring keratoplasty had keratoconus (Bajracharya L et al, 2013).

The threat to vision imparted by the diagnosis of keratoconus in a young population group is a heavy burden weighing down upon the quality of life and career planning of these patients.

But there is good news: during the past 15 years the advent of corneal collagen cross-linking (CXL) to *stop* the disease progression has considerably brightened the outlook. In the original Dresden Protocol developed by Theo Seiler in 1998, the central corneal epithelium is removed and the corneal stroma is then saturated with yellow riboflavin. This is followed by UV light exposure as per protocol. The required basic equipment (an older low-fluence model UV source) can easily be purchased at about the price of a slit lamp. This simple procedure does not normally require an operating theatre, and the equipment can easily be taken to outlying areas. The required consumables too can be reasonably affordable even in developing countries. The one thing that a low-fluence CXL definitely takes is time: low-fluence protocols require eye drops to be instilled every two minutes for a total of 60 minutes. But this step of the procedure can be delegated to trained ancillary staff. Yes, there are newer *high-fluence* devices available, which can cut the total procedure time to less than half. This would add considerable cost for equipment and consumables – which most of us fortunately can avoid with the low-fluence devices. Of course, you have to be able to tell which patients have progressive keratoconus, and if the corneas you plan to treat retain a safe thickness ( $\geq 400 \mu\text{m}$  w/o epithelium). This means some investment is needed into your capability to determine corneal thickness and to document corneal shape. An ultrasonic pachymeter (or alternative) is indispensable, and a Placido-based topographer would be great. Depending on your local situation, you could substitute



the topographer with a Placido disk and a keratometer.

A Scheimpflug-based corneal *tomography* device would, of course, be ideal for a comprehensive one-step assessment. But to date these devices remain out of reach for many of us because of the cost. They definitely widen options: they enable discovery of very early cases and can identify those advanced keratoconus cases with thin corneas which still can be treated safely. If that is not what you need to do, then at this point in time consider corneal *tomographers* for your long-term wish list of the most essentials. With CXL we have a simple procedure which can stem the dreaded visual loss which keratoconus so often brings to young adults. Why then, more than a decade after its inception, is it not used more widely? After all, it can be affordable, is safe, and is effective. Or is it?

That a procedure is safe to use and effective in reaching the stated goals can only be verified by prospective studies. The problem is that we had limited prospective studies available. History has taught us that new techniques often are not based on hard evidence, but on speculations, proposals, and assumptions. Understandably, regulatory agencies in many countries demand to first see results of well-designed prospective studies before giving their seal of approval. Equally understandably, clinicians and patients can be hesitant. Fortunately, the prospects for a wide approval at least for *epithelium-off* CXL are good. The UK National Institute for Health and Care Excellence (NICE) is a UK Public Body providing evidence-based national guidance and advice to improve health care. In September 2013 NICE published the guidance document IPG466 stating: “... *Current evidence on the safety and efficacy of epithelium-off CXL for keratoconus ... is adequate in quality and quantity. ... Therefore, this procedure can be used provided that normal arrangements are in place for clinical governance, consent and audit.*” (Please note that this statement did not cover *epithelium-on* CXL.) Closer to home, the Indian Journal of Ophthalmology dedicated its August 2013 issue to keratoconus and CXL (Agrawal V, 2013), arriving at similar conclusions. It is high time that all of us eye care practitioners shake off our old habits - if we have them - of thinking about patients with progressive keratoconus just as candidates for stronger and stronger glasses or contact lenses. Knowing that we now can safely and effectively stop keratoconus from progression, we are obliged to offer affordable versions of CXL to suitable candidates. It can be done ... let's do it!

## References

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**Source of support: nil. Conflict of interest: none**