Editorial

A close look at cornea

Dear Friends,

Cornea, the only nonvascular organ of the body, has always been the topic of interest for many researchers in the field of ophthalmology and many studies are being published on assessment of corneal biomechanics. In the recent past, the assessment of the biomechanical properties of the cornea was only possible with theoretical and laboratory models.[1] Later emerged, the Ocular Response Analyzer (ORA), a simple device used to measure the *in vivo* dynamic assessment of the biomechanical properties of the cornea.[1,2] ORA is a recently evolved technique and, as of date, very few studies[3,4] have evaluated the same. Murugesan *et al.* in this issue has published a prospective cohort study evaluating the corneal biomechanical parameters following penetrating keratoplasty(PK) using ORA in 54 eyes of 50 patients who underwent PK in comparison with 100 normal controls. The parameters that were estimated for evaluating corneal biomechanics were Golmann-corrected intraocular pressure (IOPg), corneal compensated intraocular pressure (IOPcc), corneal hysthesis (CH), and corneal resistance factor (CRF). The authors found a statistically significant increase in both the intraocular pressures (IOPg and IOPcc) with a decrease in CH and CRF. Although the results were similar to that of previous studies,[3,4] postoperative corneal astigmatism was not correlated with these biomechanical parameters in the present study. Hence, further studies are needed in this arena for a complete understanding of various corneal parameters following various interventional techniques.

Keratoconus is a noninflammatory disorder characterized by ectasia of the central or inferior portion of the cornea.[5,6] It can occur in isolation or along with some genetic disorders such as Down syndrome or Leber's congenital amourosis.[7] Majority (>90%) of the cases occur bilaterally and usually start at puberty and progresses gradually. Although conservative management using contact lenses is possible, surgical correction has been advocated for around 12–45% of the cases.[8,9] PK has been the accepted surgical technique worldwide.[10] A very good visual prognosis has been reported to an extent of around 90–97% at the end of 4 years[11,12] and 90% at the end of 11 years.[13] Despite this, one-fourth of the cases have been reported to be associated with graft rejection.[13,14] Viability of endothelial layer in the cornea is crucial for graft acceptance.[13] Apart from graft rejection, irregular astigmatism and corneal opacification have also been reported with PK.[14] Hence, deep anterior lamellar keratoplasty (DALK), a surgical procedure for removing the corneal stroma down to Descemet's membrane, was introduced as an alternative to PK.[15] It is most useful for the treatment of corneal disease with a normally functioning endothelium. There is not much consideration to be given to the endothelium of donor's cornea in DALK. Considering its success, there has been a recent surge in the number of patients on whom DALK was performed.[16] Khakshoor *et al.* in this issue has published a study revealing the clinical efficacy of DALK in patients of advanced stage keratoconus with steep curvature. The authors have noted a postoperative best spectacle corrected visual acuity of at least 20/40 in around 78% of the individuals, comparable with reports from other parts of the world.[17] Similarly, the intraoperative conversion to PK was also observed in less than 5%, as reported elsewhere.[18] Hence, even in advanced cases of keratoconus, DALK may be associated with a good visual prognosis.

Corneal blindness is the third leading cause of blindness worldwide. The immune privileged nature of the cornea has attracted the attention of researchers as a possible mechanism for devising newer therapies for corneal diseases. Gene therapy is an emerging technology particularly suited for the cornea because of its ease of access, ease of vector administration, and frequent noninvasive monitoring. It is interesting to understand the basic science of the gene therapy being carried out for various ocular surface disorders.[19]

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