INTRODUCTION

The cornea is a mechanically tough membrane that forms a barrier between the eye and the external environment . ***(Edmund et al., 1999)***

The Corneal stroma constitutes 90% of the corneal thickness and is a highly specialized tissue which is responsible for its mechanical and refractive properties ***(Tripathi et al., 1984).*** The specific architecture of the most anterior part of the corneal stroma (100-120 µ) has been suggested to be responsible for the stability of the corneal shape ***(Muller et al., 2001).***

The exact mechanism which maintains the corneal contour itself is not known , but may be due to the passive distension of corneal tissues which is maintained by the corneal mass , the elastic properties of corneal tissue and the mechanical force acting on this tissue (IOP) .However, rigidity or elasticity of corneas are known to vary greatly between individuals and these parameters have only recently been widely accepted as important when measuring the IOP ***(Luce , 2005)***

Several studies have been performed in the past to determine the rigidity or the elasticity of the cornea , it argued that IOP measured by applanation tonometer doesn't always give a true reading ***(Liu and Roberts , 2005) .***

Some studies have demonstrated the importance of central corneal thickness (CCT) measurements as a measure of ocular rigidity i.e. IOP values deviated when CCT , curvature or biomechanical properties varied from normal value ***(Brandt et al., 1999)***

The Ocular Response Analyzer (ORA) is an adaptation of the non-contact tonometer that allows measurement of IOP as well as new measurement called hysteresis and corneal resistance factor (CRF) ***(Shimmyo et al., 2003)***

The Corneal hysteresis phenomenon is a result of viscoelastic dampening in the cornea due to the combined effect of the corneal thickness and rigidity. In other words , the tissue's ability to absorb and dissipate energy.

Studies have shown that subjects whose corneas exhibit low corneal hysteresis , which can be thought of as having a soft cornea , are probable candidates for a variety of ocular diseases and complications ***(Brandt et al., 1999).*** It has been shown that the elastic and viscoelastic properties of the cornea are related , making the measurement of hysteresis at an accurate measurement of IOP less influenced by corneal properties such as central corneal thickness (CCT).

Evidence suggests that the cornea may reflect the condition of the lamina cribrosa at the back of the eye. The fact that the pressure obtained from the eye of a normal-tension glaucoma subject looks similar to that obtained from keratoconus , Fuch's & post-LASIK patients , reinforcing the theory that glaucomatous damage presents itself via the cornea (Brubaker , 1999).Compared to normal subjects , glaucomatous subjects have a significantly lower average corneal hysteresis and a much wider range ***(Shah , 2000)***