Introduction

Glaucoma is a potentially blinding optic neuropathy that is estimated to affect 60.5 million people worldwide by 2010. **(Quigley HA, Broman AT.2006)** Identified risk factors for glaucoma include older age, lower central corneal thickness (CCT), elevated intraocular pressure (IOP), African-American race and Hispanic ethnicity. **(Tielsch JM, et al1991) - (Leske MC, et al2007)** . Since IOP is the only currently modifiable risk factor for glaucoma, its accurate assessment and successful reduction is crucial to treating the disease.

The current clinical gold standard for measuring IOP is Goldmann applanation tonometry (GAT).**(Doughty MJ, et al 2000)**.

Although it has been shown that GAT values are elevated in eyes with thicker corneas, adjustment of IOP for CCT has not been widely adopted due to the variable magnitude of influence of CCT on GAT and the risk of overcorrection. **(Gunvant P, et al2005)** .

In addition, there is evidence from large clinical trials to suggest that low CCT may be a risk factor for glaucoma independent of its direct impact on GAT measurement **(Gordon MO, et al 2002) - (Leske MC, et al2007)**; this may result from either anatomical structure and/or genetic tissue susceptibility.   **(Toh T, et al 2005)** - **(Leske MC, et al2007)** .

One possible explanation for the failure of CCT to account accurately for GAT measurement inaccuracies is that resistance to corneal deformation during applanation is more related to corneal viscoelasticity or strength, rather than corneal thickness. **(Schroeder B, et al2008)**.

Recently, the Ocular Response Analyzer (ORA; Reichert, Corp., New York, USA) has been used to attempt to adjust for viscoelastic corneal properties when measuring IOP.

The cornea as a viscoelastic structure contains a component of static resistance and acomponent of dynamic resistence, the response of the cornea to an applied force such as tonometry depends on the magnitude of the force and on the rate of change of the force **(*Goldmann H, Schmidt T.1957*)** .

The cornea reacts to stress as a visco-elastic material , i.e. for a given stress , the resultant corneal strain is time dependent. The visco-elastic response consists of an immediate deformation followed by a rather slow deformationn **(*Edmund C.1988)*

It has been suggested that hysteresis may be a measurement which is the result of the damping of the cornea because of its visco-elastic properties and is derived from the difference of the two applanation measurements during the applanation process.

Thus the hysteresis is a measure of visco-elasticity due to the combined effect of the corneal thickness and rigidity**(*Luce DA.2005*)** .

Value of corneal hysteresis in glaucoma :

More accurate IOP measurement especially after refractive surgeries**(Kynigopoulos M,et al .2008) ,** new tool for determining treatment necessity and efficacy for glaucoma patients**(Kynigopoulos M,et al.2008)** and an additional evidence to predict glaucoma progress.