

## Effects of Dry Eyes on Corneal Keratometry Measured by VERION™ Image Guided System

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### Abstract

**Background:** To obtain the precise preoperative measurement of preexisting corneal astigmatism in cataract surgery with toric intraocular lens (IOL) implantation is important. There were reports of irregular corneal surface and topographic patterns in dry eye patients which affect the corneal parameters in some corneal measurement devices.

**Objective:** To investigate the effect of dry eye and artificial tear on parameters associated with corneal curvature, corneal astigmatism, recommended IOL placement axis, recommended IOL spherical power, recommended IOL cylindrical power and calculated residual astigmatism measured by VERION™ Image Guided System in subjects who plan for cataract surgery with toric IOL implantation.

**Material and method:** This is prospective, quasi-experimental study. All subjects were classified into non-dry eye or dry eye group. All parameters were obtained using VERION™ at baseline, 5 minutes and 30 minutes after artificial tear instillation. All measurements were analyzed using repeated measures ANOVA.

**Results:** Seventy eyes of 35 subjects were included in this study. Twenty eight (40%) eyes were classified as dry eye level 1, 19(27.14%) eyes as level 2, 8 (11.42%) eyes as level 3, 1 (1.42%) eye as level 4 and 14 (20%) eyes had non-dry eye. In subgroup analysis, there were no statistically significant difference in the mean corneal curvature, amount of refractive cylinder, recommended IOL placement axis, recommended IOL spherical power, recommended IOL cylindrical power between baseline and 5 minutes and 30 minutes after artificial tear instillation in all subgroups ( $p > 0.05$ ). There was statistically significant difference in calculated residual astigmatism between baseline and 30 minutes of dry eye level 2 subgroup ( $p=0.01$ ).

**Conclusion:** The accuracy of measurement by VERION™ may affected by dry eye disease, especially in more than level 2 of dry eye. The accurate corneal parameters must be obtained for calculating the correct IOL placement axis, toric IOL spherical and cylindrical power.

**Keywords:** dry eye, cataract surgery, phacoemulsification, toric intraocular lens, corneal curvature, keratometry, corneal astigmatism, IOL calculation, VERION™ Image-Guided System

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