Effects of long-term topical prostaglandin therapy on central corneal thickness
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Purpose: Recent studies have shown that prostaglandin analogues can decrease the central corneal thickness (CCT), however, most studies followed the patient’s CCT for only approximately 2 years. The purpose of this present study was to use an anterior segment tomography instrument, which can provide a non-contact quantitative evaluation of CCT and which is suitable for screening, to perform a long-term follow-up investigation of CCT in patients who underwent only topical prostaglandin monotherapy over 4 years, and then analyze the CCT changes and the correlation between intraocular pressure (IOP) changes and CCT changes.

Methods: This study involved 52 eyes (36 right eyes and 16 left eyes) of 52 glaucoma patients (29 females and 23 males, mean age: 60.6 ± 15.5 years; mean follow-up period: 55.0 ± 6.7 months) who consulted with a glaucoma specialist at the Glaucoma Clinic of Kyoto Prefectural University of Medicine, Kyoto, Japan and underwent latanoprost eye drop monotherapy for more than 4 years in at least one eye between 2005 and 2011. In all patients, CCT changes were evaluated by use of the Pentacam® (Oculus Optikgeräte GmbH, Wetzlar, Germany) anterior segment tomography instrument at pretreatment, midpoint, and final follow-up (more than 4 years from the first observations). The thinnest values were used as the CCT values in the central area of the corneal thickness map. In patients who underwent latanoprost treatment in both eyes, only the right-eye CCT values were used. In the patients who underwent latanoprost eye drop treatment for only one eye, the CCT values for that one eye were used. Patients in which the image could not be obtained clearly due to blinking or other reasons were excluded from the study. The Student’s t-test was used to analyze the CCT changes, and a p-value of < 0.05 was considered significant.

Results: Of the 52 patients, there were 34 cases of normal tension glaucoma (NTG), 11 cases of primary open angle glaucoma (POAG), 1 case of primary angle closure glaucoma (PACG), 1 case of secondary glaucoma, and 5 cases of other types of glaucoma. The mean CCT significantly decreased from 537 ± 34 µm at pre-treatment to 526 ± 32 µm at the final follow-up (p < 0.0001). Interestingly, no significant difference was found between the mean CCT at midpoint and that at final follow-up (p = 0.17), yet the mean CCT significantly decreased to 529 ± 32 µm in the first 2 years (p = 0.0015). No correlation was found between IOP reduction and CCT reduction.

Conclusions: The findings of this study show that latanoprost eye drops significantly reduce CCT during the initial stage of their usage, however, CCT reduction does not clinically affect IOP values.