Comparison of Ocular Response Analyzer Parameters in Chinese Subjects With Primary Angle-Closure and Primary Open-Angle Glaucoma

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Objectives: To evaluate corneal hysteresis (CH) and intraocular pressure (IOP) measured by the Ocular Response Analyzer in Chinese subjects with primary angle-closure glaucoma (PACG), assess their relationship with Goldmann applanation tonometry (GAT) measurements, and compare this with subjects with primary open-angle glaucoma (POAG) and normal controls.

Methods: In this prospective observational study, consecutive subjects with PACG and POAG without prior intraocular surgery were enrolled from glaucoma clinics. Normal subjects were recruited from an ongoing population-based study. One eye of each subject underwent standardized ocular examination and IOP measurement by GAT and the Ocular Response Analyzer. Corneal hysteresis and corneal-compensated IOP were compared between groups.

Results: Of the 443 subjects recruited, 131 had PACG, 162 had POAG, and 150 were normal. Corneal hysteresis was lower in PACG (9.1 mm Hg; 95% confidence interval [CI], 8.7 to 9.4 mm Hg) and POAG (9.5 mm Hg; 95% CI, 9.2 to 9.5 mm Hg) eyes compared with control eyes (10.4 mm Hg; 95% CI, 10.1 to 10.6 mm Hg; $P < .001$ for both), with no difference ($P = .16$) in CH found between PACG and POAG eyes. After adjusting for age, sex, and IOP measurement by GAT, CH persisted to be lower only in eyes with PACG in comparison with control eyes (9.4 vs 10.1 mm Hg; $P = .006$). Eyes with POAG had lower CH than control eyes but the difference was not statistically significant (9.6 vs 10.1 mm Hg; $P = .06$).

Conclusions: Corneal hysteresis was lower in eyes with glaucoma. After adjusting for age, sex, and IOP measurement by GAT, a persistently lower hysteresis was noted in eyes with PACG compared with other groups.

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THE INFLUENCE OF CENTRAL corneal thickness (CCT) and corneal curvature on Goldmann applanation tonometry (GAT) has been extensively studied.[1-8] Corneal biomechanical properties are known to affect intraocular pressure (IOP) measurement, and it has been proposed that differences in such properties may explain why some eyes are more susceptible than others to glaucomatous optic nerve damage.[9] The Ocular Response Analyzer (ORA) (Reichert Ophthalmic Instruments, Buffalo, New York) is an instrument designed to measure corneal biomechanical properties such as corneal hysteresis (CH) and to provide IOP measurement that is theoretically less influenced by physical properties of the cornea.[10] Initial studies have reported that the IOP estimation by ORA is higher than GAT values in subjects with glaucoma.[11,12] Corneal hysteresis is also reported to be lower in eyes with primary open-angle glaucoma (POAG) compared with those with ocular hypertension.[13,14]

Primary angle-closure glaucoma (PACG) is a major form of glaucoma in Asia. The disease is associated with significant visual morbidity and blindness.[15] In a study, eyes with PACG were found to have greater IOP-dependent visual field damage compared with those with POAG.[16] The reasons for these differences have not been clearly understood, and it would be interesting to know if differences in ocular and specifically corneal biomechanical properties may contribute to the varying optic nerve damage associated with the different subtypes of glaucoma.

The aim of this study was to evaluate CH and IOP measured by ORA in Chinese subjects with PACG, assess their relationship with CCT and GAT measurements, and compare this with subjects with POAG and normal controls.

METHODS

This was a prospective observational study. Written informed consent was obtained from

all subjects and the study had the approval of the ethics committee of the Singapore Eye Research Institute and was carried out according to the tenets of the Declaration of Helsinki. Consecutive subjects from a glaucoma clinic with PACG and POAG were enrolled. Glaucoma was defined as the presence of glaucomatous optic neuropathy (GON) (defined as loss of the neuroretinal rim with a vertical cup-disc ratio of >0.7 and/or notching attributable to glaucoma) with an associated visual field defect, defined by the following: (1) glaucoma hemifield test result outside normal limits, (2) a cluster of 3 or more nonedge, contiguous points on the pattern deviation plot not crossing the horizontal meridian, with a probability of less than 5% of being present in age-matched control subjects (with at least 1 of the cluster points having a probability value of <1%), and (3) pattern standard deviation less than 0.05; these were repeatable on 2 separate occasions. Primary angle-closure glaucoma was defined as the presence of GON with corresponding visual field loss in association with a closed angle (presence of at least 180° of angle in which the posterior trabecular meshwork was not visible on nonindentation gonioscopy) and raised IOP and/or peripheral anterior synechiae (defined as abnormal adhesions of the iris to the angle that were present to the level of the anterior trabecular meshwork or higher). All subjects with PACG had undergone a laser iridotomy at least 1 month prior to enrollment in the study. Patients with POAG had GON and open angles and were in turn subdivided into high-tension glaucoma (HTG) and normal-tension glaucoma (NTG) groups, defined as follows:

- High-tension glaucoma was defined as GON, visual field defects consistent with glaucoma, IOP consistently higher than 21 mm Hg, and open angles on gonioscopy.
- Normal-tension glaucoma was defined as GON, visual field defects consistent with glaucoma, IOP that never exceeded 21 mm Hg during a diurnal phasing, and open angles on gonioscopy. All patients classified as having NTG had undergone at least 8 daytime diurnal IOP measurements recorded between 8 AM and 5 PM with noncontact air-puff tonometry (CT-80 Computerized Non-Contact Tonometer; Topcon, Tokyo, Japan).

Exclusion criteria included eyes with a history of intraocular surgery, laser iridotomy within 30 days prior to enrollment, secondary glaucoma such as uveitic or neovascular glaucoma, corneal decompensation or corneal abnormalities that prevented accurate IOP measurement, previous trauma, and other nonglaucomatous optic neuropathies. Subjects with concurrent or prior use of glaucoma medications were not excluded.

A control group of normal subjects (defined as having an IOP≤21 mm Hg with open angles, healthy optic nerves and normal visual fields, no previous surgery, and no family history of glaucoma) were recruited. These subjects were derived from an ongoing population-based study of Chinese persons 40 years and older (Singapore Chinese Eye Study),[17] described in detail elsewhere.[18,19] For this report, 102 consecutive normal Chinese study subjects were included as population controls.

All subjects with glaucoma and controls underwent identical examination that included best-corrected visual acuity measurement, ORA measurements (see later), keratometry and axial length (IOLMaster; Carl Zeiss Meditec, Jena, Germany) measurement, CCT measurement by ultrasound pachymetry (UP-1000; Nidek Co LTD, Gamagori, Japan), automated perimetry (24-2 Swedish interactive thresholding algorithm standard strategy, Humphrey Visual Field Analyzer 750i; Humphrey Instruments, Dublin, California), and IOP measurement by GAT (IOP-GAT) (Haag-Streit, Koenz, Switzerland). Dynamic gonioscopy (Sussman 4-mirror gonioscope; Ocular Instruments Inc, Bellevue, Washington), slitlamp examination of the anterior segment, and biomicroscopic evaluation of the posterior pole (optic nerve and macula) were conducted by a single fellowship-trained glaucoma specialist (A.N.). A detailed history of medical and surgical therapy and blood pressure (Dinamap GE Pro 100V2; GE Health Care, Milwaukee, Wisconsin) were also recorded.

Details regarding ORA technology have been published previously.[10] Briefly, the ORA uses a noncontact rapid air pulse to generate a signal. The ORA signal depicts 2 IOP measurements P1 and P2. The average of P1 and P2 is a measure of IOP. The difference between P1 and P2 is a measure of CH. Corneal-compensated IOP (IOPcc) is generated by the software and represents IOP less influenced by corneal tissue properties.

The right eye of each eligible subject was evaluated; when the right eye was ineligible, the left eye was included. Each eye had an average of 4 to 6 sequential measurements by ORA and 3 good-quality ORA signals were saved, based on the criteria set by the manufacturer (ie, measurements with split signals, low amplitude, and asymmetrical shape were not saved). This was followed by 3 IOP measurements by GAT at least 15 minutes after the ORA measurements. The mean of GAT values, along with averaged readings generated by the software for the ORA parameters IOPcc, Goldmann-correlated IOP, and CH, were analyzed.

We compared patient characteristics, IOP-GAT, and ORA parameters of IOPcc, Goldmann-correlated IOP, and CH between subgroups (PACG, POAG, and control eyes) using 1-way analysis of variance. Intergroup differences in mean values of variables were analyzed using post hoc Bonferroni tests. In addition, effects of age and IOP were adjusted and analyzed using analysis of covariance. Bland-Altman limits of agreement analysis was used to study the agreement between instrument measurements. The mean bias in IOPcc values from mean IOP-GAT values between groups was compared using independent-samples *t* tests. Correlation of continuous data variables obtained from the instruments was analyzed using the Pearson correlation test (2-sided). A multivariate linear regression model was constructed with CH as the dependent variable and relevant ocular and systemic predictive factors available in the database. Significance was set at $P<.05$ for this study. Bland-Altman analysis was conducted by MedCalc software (version 10.4.6.0; MedCalc Mariakerke, Belgium) and all other analyses were conducted with SPSS (version 15.0; SPSS Inc, Chicago, Illinois).

RESULTS

A total of 443 eyes of 443 Chinese subjects were included in the study. This consisted of 131 subjects with PACG, 162 subjects with POAG (71 HTG and 91 NTG), and 150 normal eyes. The demographics and clinical and ocular characteristics of the study population are shown in **Table 1**. No difference was noted in the mean age among the glaucoma subtypes (PACG vs POAG; $P=.08$), but the mean age of the control subjects was lower compared with those with PACG ($P<.001$) and POAG ($P<.001$). There were more women (73 of 131; $P<.001$) in the PACG group and more men (111 of 162; $P<.001$) in the POAG group. Eyes with PACG were less myopic than both POAG ($P<.001$) and control ($P=.003$) eyes. Mean CCT was higher in control eyes compared with POAG eyes ($P=.01$). Mean CCT in PACG eyes was not significantly different compared with control ($P=.12$) and POAG ($P\geq.05$) eyes.

Mean IOP-GAT and ORA parameters for the study population are shown in **Table 2**. Mean IOPcc was highest in PACG eyes followed by POAG ($P<.001$) and control ($P<.001$) eyes. Bland-Altman plots (**Figure 1**) in-

Table 1. Demographics and Baseline Characteristics of Subjects With Primary Glaucoma and Control Subjects[a]

Characteristic	Mean (SD) PACG (n=131)	POAG (n=162)	Controls (n=150)	*P* Value[b]
Age, y	67.1 (9.8)	64.6 (10.5)	54.7 (8.5)	<.001
Female, %	55.7	31.5	48.7	<.001
Spherical equivalent, D	–0.3 (1.9)	–1.7 (3.2)	–1.2 (2.9)	<.001
Corneal curvature, mm	7.6 (0.28)	7.6 (0.22)	7.6 (0.24)	.64
Axial length, mm	23.0 (0.89)	24.6 (1.5)	24.0 (1.2)	<.001
IOP-GAT, mm Hg	16.5 (4.4)	14.9 (3.2)	14.4 (2.7)	<.001
CCT, µm	540.8 (39.4)	537.9 (32.3)	549.4 (32.5)	.01

Abbreviations: CCT, central corneal thickness; D, diopter; IOP-GAT, intraocular pressure measured by Goldmann applanation tonometry; PACG, primary angle-closure glaucoma; POAG, primary open-angle glaucoma.
[a] N = 443.
[b] *P* values determined using 1-way analysis of variance.

Table 2. Ocular Response Analyzer Parameters in Subjects With Primary Glaucoma and Control Subjects[a]

Parameter	Mean (95% CI), mm Hg PACG (n=131)	POAG (n=162)	Controls (n=150)	*P* Value[b]
IOP-GAT	16.5 (15.7-17.2)	14.9 (14.4-15.3)	14.4 (14.0-14.8)	<.001
IOPcc	18.1 (17.2-18.9)	15.9 (15.3-16.4)	14.4 (13.9-14.8)	<.001
IOPg	16.4 (15.6-17.2)	14.4 (13.8-14.9)	13.7 (13.2-14.2)	<.001
CH[c]	9.1 (8.7-9.4)	9.5 (9.2-9.5)	10.4 (10.1-10.6)	<.001
Adjusted CH[d,e]	9.4 (9.1-9.7)	9.6 (9.3-9.8)	10.1 (9.8-10.4)	.006

Abbreviations: CH, corneal hysteresis; CI, confidence interval; IOPcc, corneal-compensated intraocular pressure; IOPg, Goldmann-correlated intraocular pressure; IOP-GAT, intraocular pressure measured by Goldmann applanation tonometry; PACG, primary angle-closure glaucoma; POAG, primary open-angle glaucoma.
[a] N = 443.
[b] *P* values determined using 1-way analysis of variance.
[c] Mean CH (Bonferroni corrected): control eyes vs PACG eyes, $P < .001$; control eyes vs POAG eyes, $P < .001$; and PACG eyes vs POAG eyes, $P = .16$.
[d] Adjusted CH (Bonferroni corrected): control eyes vs PACG eyes, $P < .006$; control eyes vs POAG eyes, $P = .06$; and PACG eyes vs POAG eyes, $P = .70$.
[e] Adjusted for age, sex, and IOP-GAT values.

dicated a positive mean difference between IOPcc and IOP-GAT in eyes with PACG (1.6 mm Hg; 95% confidence interval [CI], –6.4 to 9.6 mm Hg) and POAG (1.0 mm Hg, 95% CI, –5.3 to 7.4 mm Hg), but this was not found in control eyes (–0.05 mm Hg; 95% CI, –6.3 to 6.2 mm Hg).

Mean CH was lower in both PACG (9.1 mm Hg; 95% CI, 8.7 to 9.4 mm Hg) and POAG (9.5 mm Hg; 95% CI, 9.2 to 9.5 mm Hg) eyes compared with control eyes (10.4 mm Hg; 95% CI, 10.1 to 10.6 mm Hg; $P < .001$ for both). No difference was noted in CH between POAG and PACG eyes ($P = .16$). After adjusting for age, sex, and IOP-GAT, CH persisted to be lower only in eyes with PACG in comparison with control eyes (9.4 vs 10.1 mm Hg; $P = .006$). Eyes with POAG had lower CH than control eyes but this difference was not statistically significant (9.6 vs 10.1 mm Hg; $P = .06$).

Significant correlation ($P < .01$) was noted between IOP-GAT and IOPcc among all the groups, with the strength of correlation moderately strong among PACG ($r = 0.642$) and POAG ($r = 0.574$) eyes compared with fair correlation among control eyes ($r = 0.373$). The IOP-GAT and CH were not correlated in normal eyes ($r = 0.105$; $P = .20$), and a weak negative correlation was noted among the glaucoma groups (PACG: $r = –0.322$; $P < .01$ vs POAG: $r = –0.177$; $P < .02$). A negative correlation between IOPcc and CH was noted in all groups (PACG $r = –0.709$; $P < .001$; POAG: $r = –0.647$; $P < .001$; control eyes: $r = –0.547$; $P < .001$). No correlation was noted between IOPcc and CCT in all groups. The correlation between CH and CCT was moderate in all groups (**Figure 2**). On multivariate analysis (**Table 3**), CH was associated significantly with IOP-GAT in the PACG ($\beta = –0.15$; $P = .01$) and POAG ($\beta = –0.09$; $P < .05$) groups and with CCT in all 3 groups ($\beta = 0.02$; $P < .001$ for all) after adjusting for factors like age, sex, IOP-GAT, CCT, refractive error, corneal curvature, axial length, systolic blood pressure, and diastolic blood pressure. Corneal hysteresis was associated with age in control eyes ($\beta = –0.04$; $P < .01$) and with corneal curvature in POAG ($\beta = –1.7$; $P < .01$) and control ($\beta = –1.7$; $P < .01$) eyes.

A subanalysis of POAG (71 eyes with HTG and 91 eyes with NTG) is summarized in **Table 4**. Mean CH in the NTG group was higher than the HTG group but this difference was not significant.

COMMENT

To our knowledge, this study is the first report of ORA parameters in Asian individuals comparing PACG and POAG against normal subjects. We found CH to be lower

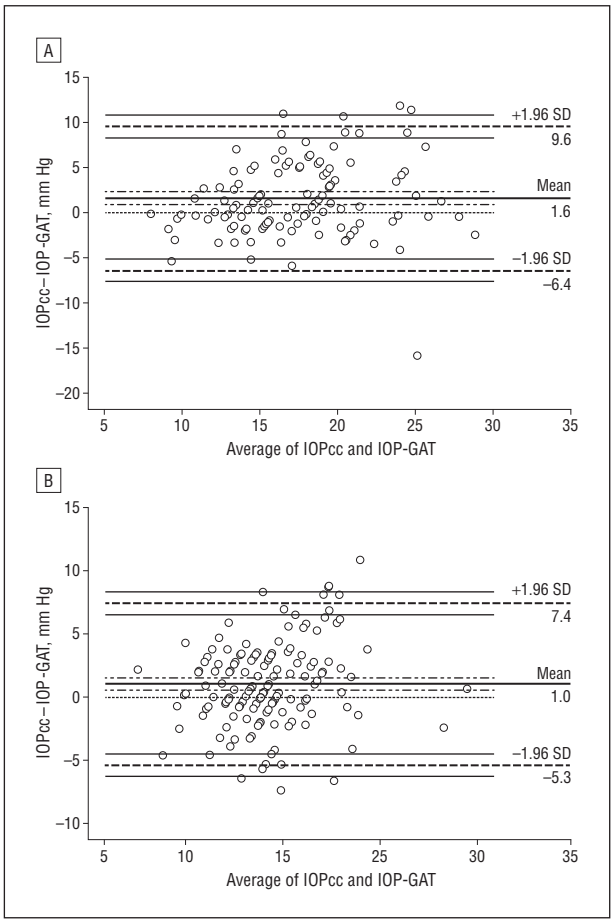

Figure 1. Bland-Altman plots for agreement between corneal-compensated intraocular pressure (IOPcc) in comparison with intraocular pressure measured by Goldmann applanation tonometry (IOP-GAT). A, Primary angle-closure glaucoma: positive mean difference of 1.6 mm Hg; 95% confidence interval, –6.4 to 9.6 mm Hg. B, Primary open-angle glaucoma: positive mean difference of 1.0 mm Hg; 95% confidence interval, –5.3 to 7.4 mm Hg.

in glaucomatous eyes (PACG and POAG combined) compared with control eyes. Corneal hysteresis has been reported to decrease with age,[20,21] and after adjusting for age, sex, and IOP-GAT values, a difference persisted only between PACG and normal eyes. Our study also showed that IOP measurements generated by ORA (IOPcc) were higher than IOP-GAT values in eyes with glaucoma, and this effect was more pronounced in PACG eyes than POAG eyes but not apparent in normal eyes.

There are few studies to compare our findings. Sun et al[22] also reported a lower CH in their group of 40 Chinese subjects with chronic PACG with uncontrolled IOP at initial presentation. They reported a recovery of CH in eyes with PACG after IOP reduction but it continued to remain lower than normal controls in their study. In a subanalysis of POAG (HTG and NTG) eyes, we found a marginally higher (but not statistically significant) CH value in eyes with NTG compared with HTG. Prior reports about differences in CH between NTG and POAG (HTG) groups have been variable. Ang et al[23] reported a higher CH among NTG eyes but Shah et al[14] found a lower CH when compared with subjects with HTG.

The ORA is a tool that helps to quantify IOP by integrating the corneal biomechanical properties and may provide an estimate of IOP that is less influenced by corneal factors compared with GAT. This may be true for CCT as evidenced by the lack of correlation between IOPcc and CCT in our study. However, we found a negative correlation between IOPcc and CH in all 3 groups. This suggests that IOPcc is not totally independent of CH.

Subjects with glaucoma (PACG and POAG combined) in our study had greater mean IOPcc values than mean IOP-GAT values in comparison with control eyes. This is consistent with previous reports.[11,12,24] Sullivan-Mee et al[11] have reported a similar difference in IOP estimates between subjects with glaucoma (POAG) and without glaucoma in their study and reported higher IOPcc estimates to be a significant discriminant factor for glaucoma. Lam et al[24] found good agreement between IOPcc and IOP-GAT in a group of normal Chinese subjects, similar to our study. In our series, the trend in mean bias between IOPcc and IOP-GAT was higher in PACG compared with POAG eyes. Based on this finding, it is likely that the IOP in an eye with PACG for any given value of IOP-GAT is possibly higher than a POAG eye, if we consider IOPcc as an independent measurement. Gazzard et al[16,25] have reported that Chinese subjects with PACG have greater IOP-dependent optic nerve damage and visual field loss in comparison with those with POAG. Interestingly, studies have also shown an association of lower CH with greater glaucomatous damage and progressive visual field loss.[26,27] The relevance of our findings of higher IOPcc compared with IOP-GAT values and lower CH in PACG eyes needs further evaluation, especially with the background of greater visual morbidity that has been reported to be associated with PACG. The interaction between IOP and CH is complex and yet to be completely understood. We speculate that an estimation of IOP-GAT alone may not reflect the susceptibility of an eye to glaucomatous damage from raised IOP, and differences in CH may also be important in glaucoma susceptibility.

Corneal hysteresis was negatively associated with age in normal subjects and is in agreement with prior reports.[20] This association, however, was not seen in the glaucoma subtypes in this study. Kotecha et al[21] have reported an age-related decrease in corneal constant factor (a parameter derived from CH) in their sample of eyes with untreated ocular hypertension and control eyes. These differences may be because we did not exclude subjects who were using IOP-reducing medications. The role of medications influencing CH has been contemplated but evidence at this stage regarding this remains uncertain and needs to be explored further.[1]

Our study had some limitations. This was a cross-sectional study with measurements made only once. The repeatability of measured values obtained by the same operator and between different operators was not assessed. The diurnal IOP measurements for subjects with NTG were obtained by noncontact air-puff tonometry, which may not be as accurate as GAT. The majority of subjects with glaucoma in our study were using IOP-reducing medications and the influence of the medica-

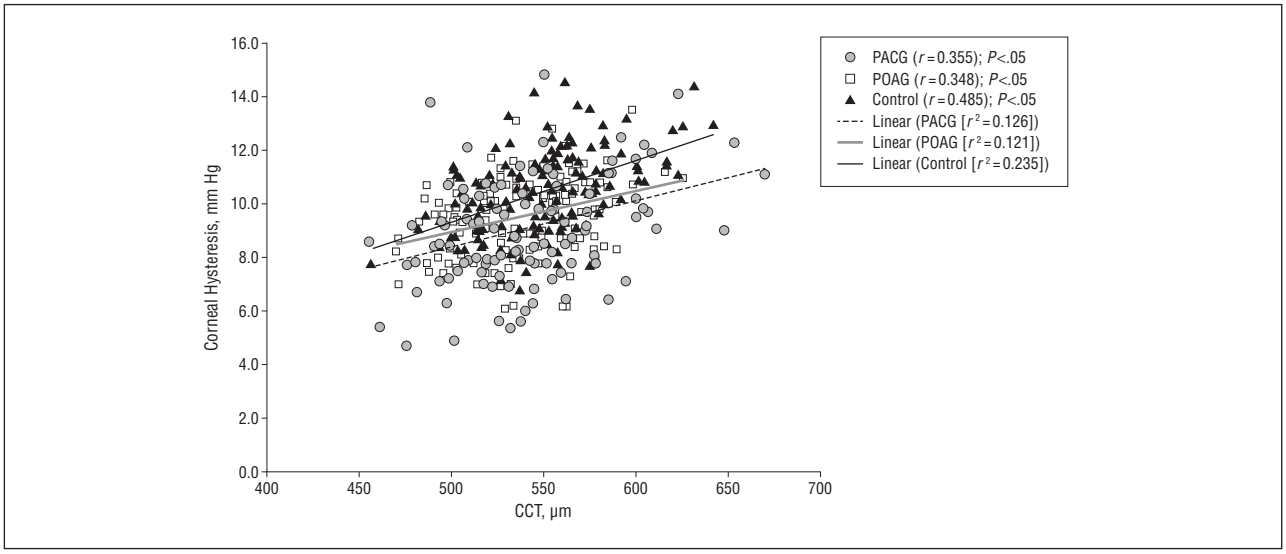

Figure 2. Correlation between central corneal thickness (CCT) and corneal hysteresis (CH). PACG indicates primary angle-closure glaucoma; POAG, primary open-angle glaucoma.

Table 3. Multiple Linear Regression Model of the Factors Associated With CH

	β (95% CI)					
	Unadjusted			Adjusted[a]		
	PACG	POAG	Controls	PACG	POAG	Controls
Age	−0.04 (−0.08 to −0.01)[b]	−0.02 (−0.04 to −0.0)[b]	−0.05 (−0.07 to −0.02)[b]	−0.03 (−0.08 to 0.01)	−0.01 (−0.04 to 0.01)	−0.04 (−0.07 to −0.01)[b]
Sex	−0.02 (−0.71 to 0.67)	0.38 (−0.09 to 0.85)	0.94 (0.46 to 1.41)[b]	−0.25 (−1.2 to 0.69)	0.27 (−0.27 to 0.82)	0.46 (−0.19 to 0.70)
IOP-GAT	−0.27 (−0.31 to −0.22)[b]	−0.24 (−0.29 to −0.19)[b]	−0.28 (−0.35 to −0.21)[b]	−0.15 (−0.26 to −0.03)[b]	−0.09 (−0.16 to −0.02)[b]	0 (−0.32 to −0.17)
CCT	0.17 (0.0 to 0.02)[b]	0.01 (0.0 to 0.02)[b]	0.02 (0.01 to 0.03)[b]	0.02 (0.01 to 0.03)[b]	0.02 (0.01 to 0.02)[b]	0.02 (0.01 to 0.02)[b]
Refractive error	−0.11 (−0.29 to 0.06)	0 (−0.06 to 0.07)	0.01 (−0.09 to 0.7)	−0.23 (−0.57 to 0.11)	0.09 (0.03 to 0.22)	0.01 (−0.11 to 0.13)
Corneal curvature	−1.0 (−2.2 to 0.18)	−0.5 (−1.5 to 0.44)	−2.1 (−3.0 to −1.1)[b]	−0.9 (−3.4 to 1.5)	−1.7 (−3.0 to −0.4)[b]	−1.7 (−2.6 to −0.16)[b]
Axial length	0 (−0.39 to 0.38)	−0.02 (−0.17 to 0.12)	−0.25 (−0.45 to −0.06)[b]	0.2 (−1.1 to 0.58)	0.16 (−0.13 to 0.47)	−0.15 (−0.40 to 0.30)
Systolic BP	−0.01 (−0.03 to 0)	−0.01 (−0.02 to 0.0)	−0.01 (−0.03 to 0.)[b]	0 (−0.02 to 0.03)	0 (−0.01 to 0.01)	0 (−0.02 to 0.01)
Diastolic BP	0 (−0.05 to 0.04)	−0.01 (−0.04 to 0.0)	−0.01 (−0.03 to 0.01)	0 (−0.06 to 0.07)	−0.01 (−0.04 to 0.01)	0 (−0.02 to 0.03)

Abbreviations: BP, blood pressure; CCT, central corneal thickness; CH, corneal hysteresis; CI, confidence interval; IOP-GAT, intraocular pressure measured by Goldmann applanation tonometry; PACG, primary angle-closure glaucoma; POAG, primary open-angle glaucoma.
[a] Adjusted for all variables in the Table.
[b] Correlations significant at $P < .05$

tions on corneal biomechanical properties is unknown. For example, prostaglandin eye drops are known to have effects on the extracellular matrix of ocular tissues via expression of matrix metalloproteinases.[28] It is thus possible that these eye drops may have an influence on corneal biomechanics. Additionally, all our PACG cases had previous laser iridotomy, which was performed at least 1 month before study recruitment. Whether this has an effect on the ORA measurements is not known. Finally, the sample size was relatively small and hence statistical values may have to be interpreted with caution.

In summary, we found lower CH in Asian eyes with glaucoma (PACG and POAG) compared with control eyes and no difference in CH between PACG and POAG. After adjusting for age, sex, and IOP-GAT, a persistently lower hysteresis was noted in eyes with PACG. Further evaluation is required with respect to the clinical implications of these factors in specific glaucoma subtypes.

Table 4. Comparative Analysis of Ocular Response Analyzer Parameters Between POAG Subgroups: HTG and NTG[a]

	Mean (SD)		
Parameter	HTG (n=71)	NTG (n=91)	*P* Value[b]
Age, y	63.3 (10.3)	65.3 (10.2)	.78
IOP-GAT, mm Hg	15.8 (3.7)	14.2 (2.5)	.05
IOPcc, mm Hg	16.8 (4.4)	15.2 (2.9)	.001
IOPg, mm Hg	15.3 (4.1)	13.7 (2.6)	.001
CH, mm Hg	9.4 (1.5)	9.6 (1.3)	.10

Abbreviations: CH, corneal hysteresis; HTG, high-tension glaucoma; IOPcc, corneal-compensated intraocular pressure; IOPg, Goldmann-correlated intraocular pressure; IOP-GAT, intraocular pressure measured by Goldmann applanation tonometry; NTG, normal-tension glaucoma; POAG, primary open-angle glaucoma.
[a] N = 162.
[b] *P* values determined using an independent-samples *t* test.

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