Survey of Glaucoma Practice Patterns Among Members of The Philippine Glaucoma Society

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ABSTRACT

Objective: To identify the glaucoma clinical practice patterns among the members of the Philippine Glaucoma Society (PGS) from 2015 to 2016 using an online survey.

Methods: An online link was sent to each consenting PGS member which directed them to two poll sites. These sites asked questions about demographics and their preferred clinical practice patterns. Frequency and percent distributions were used to analyze the data.

Results: There was a high response rate from PGS members at 97% (42 out of 43 members). More than half of respondents (51%, n=22) defined glaucoma as glaucomatous optic neuropathy with an evident visual field loss. IOP was routinely measured by 90% (n=38) of the respondents with majority preferring to use the Goldmann applanation tonometer (GAT) (98%, n=41). Gonioscopy was done on all new patients by all PGS members but only 62% did regular gonioscopy on follow-up consultations. Most of the respondents relied on the 90D lens (88%) to assess the optic nerve. Visual field examination (VFE) was routinely requested by all respondents.

Pachymetry and anterior segment optical coherence tomography (AS-OCT) were used sparingly at only 43% and 12% respectively. Appositional angle closure was addressed by performing laser iridotomy with majority of the respondents preferring a site that is covered by the upper eyelid (57%). Prostaglandin analogues were the top choice as first-line monotherapy for eyes with open-angle glaucoma. Majority of the respondents (55%) opted

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to do laser trabeculoplasty (LTP) as an adjunct to medical therapy. Mitomycin-C was the preferred intraoperative antimetabolite for trabeculectomy by 98% (n=41). Ahmed (71%, n=30) was the more favored glaucoma drainage device (GDD) by our respondents over Baerveldt (19%, n=8).

Conclusion: This survey showed majority of the glaucoma practices of PGS members appear to adhere to the current clinical practice guidelines.

Keywords: glaucoma, online survey, practice patterns, Philippines

There have been significant advances in the diagnosis and treatment of glaucoma over the past 40 years. For this vast amount of knowledge to be applied, clinical practice guidelines have been developed for the clinician. However, the decision to adapt these guidelines to personalize one's practice can still be influenced by years of experience, level of training, personal preference, or anecdotal evidence.[1] As such, glaucoma management is expected to have dissimilarities among practitioners. This has led to the publication of various practice patterns from USA[2], Canada[3], Australia and New Zealand[4,5], and India[1]. These studies employed traditional survey methods including mailed questionnaires and audience-response keypads during conferences. A more efficient and contemporary methodology is needed to document practice patterns such as online surveys.

The Philippines has an estimated population of 105 million with only 16 ophthalmologists per million individuals catering to eye health. At the time of this survey, specialized care for glaucoma was provided by both general ophthalmologists and fellowship-trained glaucoma specialists. Out of these eye care providers, 43 were members of the Philippine Glaucoma Society (PGS), an organization of fellowship-trained specialists, whose practice patterns remain undescribed. Moreover, various factors including practice setting (government or private) and socioeconomic status of the patient posed an additional challenge in creating an accurate depiction of these practice patterns.

Our study identified the glaucoma clinical practice patterns among members of the PGS from 2015 to 2016 using an online survey. Survey questions included demographics and how glaucoma was defined by each PGS member. The use of diagnostic and treatment modalities such as: intraocular pressure (IOP) measurement, gonioscopy, visual field exams (VFE), anterior segment analysis, optic nerve and retinal nerve fiber layer (RNFL) assessment, pachymetry, medical, laser, and incisional surgical treatments were also assessed. The questionnaire also included topics in general ophthalmology to pave the way for future studies comparing practice patterns among general ophthalmologists and glaucoma specialists.

METHODOLOGY

This is a cross-sectional, descriptive study of the glaucoma practice patterns among the members of the PGS in 2016. Ethics review board approval was obtained from the St. Cabrini Medical Center – Asian Eye Institute Ethics Review Committee and followed the tenets of the Declaration of Helsinki. Data confidentiality was observed for the entire duration of the study.

After obtaining an electronic informed consent per PGS member, an online link was sent to redirect each member to two poll sites. One site was used to ask questions about the definition of glaucoma and the use of diagnostic and treatment modalities (www.kwiksurveys.com). Another site was used to gather demographic data (www.poll-maker.com). Questions were validated by ten glaucoma specialists who were at that time not members of the PGS. Only questions with a mean acceptance rating of 80% or above were included in this study. Frequency and percent distributions were used to analyze the data.

RESULTS

There was a high response rate from the PGS members at 97% (42 out of 43 members). Majority of the glaucoma specialists were males (64%) and were in the 41 to 50 years age range (52%). Most members had 10 years or more of practice (67%) at the time of the survey. The National Capital Region (Metro Manila) of the Philippines was identified as the main area of practice for most members (74%, n=31). Only eleven doctors practiced in the provinces (Baguio – 1, Batangas – 2, Cebu – 1, Cagayan de Oro – 1, Davao – 1, Ilocos Norte – 1, Iloilo – 2, Naga – 1, Pampanga

– 1). In a month, most of the members saw more than 15 glaucoma patients (79%, n=33) (Table 1).

Table 1. Clinico-demographic characteristics among PGS member-respondents (2016)

Characteristics		Frequency (n=42)	Relative frequency
Gender	Male	27	64%
	Female	15	36%
Age	31–40	7	17%
	41–50	22	52%
	51 above	13	31%
Years in Practice	5–10	9	21%
	>10	28	67%
	Unknown	5	12%
Number of glaucoma patients seen in a month	<5	1	2%
	5–15	8	19%
	>15	33	79%
Place of Practice	Baguio	1	2%
	Batangas	2	4.8%
	Cebu	1	2%
	Cagayan de Oro	1	2%
	Davao	1	2%
	Iloilo	2	4.8%
	Ilocos Norte	1	2%
	Metro Manila/NCR	31	74%
	Naga	1	2%
	Pampanga	1	2%

**PGS: Philippine Glaucoma Society, NCR: National Capital Region*

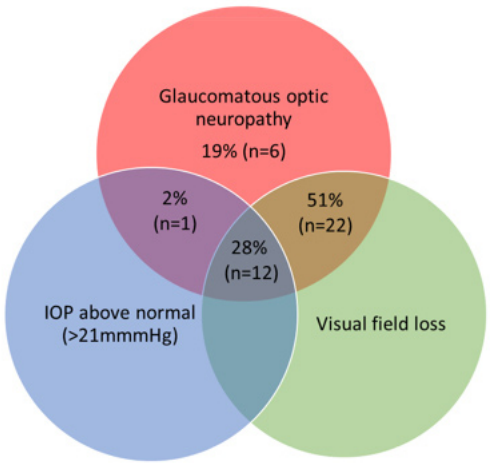

Figure 1. Definition of glaucoma among PGS member-respondents (2016)
**PGS: Philippine Glaucoma Society, IOP: Intraocular pressure*

Glaucoma was defined by more than half of the respondents (51%, n = 22) as glaucomatous optic neuropathy with an evident visual field loss. The triad of glaucomatous optic neuropathy, evidence of visual field loss, and IOP above normal (>21 mmHg) was considered as glaucoma in 28% of respondents (n = 12). The combination of elevated IOP and glaucomatous optic neuropathy was defined as glaucoma in 2% of respondents (n=1), while 19% (n=6) only needed the latter criterion in the definition (Figure 1).

IOP was routinely measured by 90% (n=38) of the respondents and 93% (n=39) remeasured the IOP if it was initially measured by other physicians. Goldmann applanation tonometry (GAT) was the preferred method of measuring IOP by 41 (98%) of the respondents, while one respondent chose the Tono-Pen (Reichert Technologies, USA) (Table 2). Diurnal IOP measurement was done by 57% (n=24) of the members and of those who do, 88% (n=21) did the measurements during office hours.

All PGS respondent members performed gonioscopy on all new patients. Regular gonioscopy was done by 62% of the respondents on follow-up consults, while 38% performed gonioscopy only on new patients. Angle assessment was done prior to dilation by 95% (n=40) of the respondents. Of these, 76% (n=31) used gonioscopy to evaluate the angles prior to dilation and 7% (n=3) would only rely on slit lamp or Van Herick technique findings. Other respondents employed a combination of these techniques to assess the angles.

All respondents performed optic nerve assessment using a combination of techniques. Majority relied on 90D lens (88%, n=36), followed by optic nerve photographs (76%, n=32), and optic nerve optical coherence tomography (76%, n=32) among others (Figure 2).

VFE was requested by all respondents. The top indications for requesting for a VFE were: patients with abnormal cupping (98%, n=41), abnormal IOP (88%, n=37), and as baseline test (71%, n=30). Other reasons cited that were not part of the choices included: periodic glaucoma follow-up, serial follow-up, monitoring of treatment plan, employment requirement, and patients with disturbing visual symptoms. The Humphrey machine (Carl Zeiss Meditec, Dublin, CA) (60%, n=25) was preferred by more respondents over the Octopus machine (Haag-Streit, Switzerland) (7%, n=3). Thirty-one percent (n=13) reported using both machines in their practice (Table 2).

Upon encountering an eye with suspiciously shallow anterior chamber or narrow angle, only 12% of the respondents (n=5) requested anterior segment imaging at all times when indicated, while 50% (n=21) did not use this diagnostic modality in their practice.

Majority of the latter group relied on gonioscopy (44%, n=11) in lieu of anterior segment imaging. Reasons for not requesting this tool cited that it adds expense for their patients (20%, n=5) or reported having no access to an anterior segment imaging machine (36%, n=9) (Table 2).

Table 2. Diagnostic practice patterns among PGS member-respondents (2016)

IOP measurement technique	Frequency	Relative frequency
GAT	41	98%
Tono-Pen	1	2%
Reasons for requesting VF (multi-response)	Frequency	Relative frequency
Patient's request	9	21%
Patients with abnormal cupping	41	98%
Patients with abnormal IOP	37	88%
Baseline test	30	71%
Other	5	12%
Preferred VF machine	Frequency	Relative frequency
Humphrey	25	60%
Octopus	3	7%
Both	13	31%
FDT	1	2%
Patient's request	9	21%
Reasons for not requesting AS-OCT	Frequency	Relative frequency
Additional expense for patients	5	20%
Rely on gonioscopy more	11	44%
No access to a machine	9	36%
Pachymetry practice	Frequency	Relative frequency
Almost always - routinely	18	43%
75% of the time	7	16%
50% of the time	8	19%
25% of the time	7	16%
No	2	5%
Reasons for requesting pachymetry	Frequency	Relative frequency
Only for refractive surgery cases (e.g. Lasik)	1	4%
Only for patients with abnormal IOP	2	9%
Baseline test	4	17%
Borderline glaucoma	11	48%
Other	5	22%
Glaucoma package components (multi-response)	Frequency	Relative frequency
Visual field exam	42	100%
Optic nerve OCT	42	100%
Optic nerve head photo	40	95%
Pachymetry	30	71%
Anterior segment OCT	6	14%
Other	3	7%

**PGS: Philippine Glaucoma Society, GAT: Goldmann applanation tonometer, IOP: Intraocular pressure, VF: Visual field, FDT: Frequency doubling technology, AS-OCT: Anterior segment optical coherence tomography*

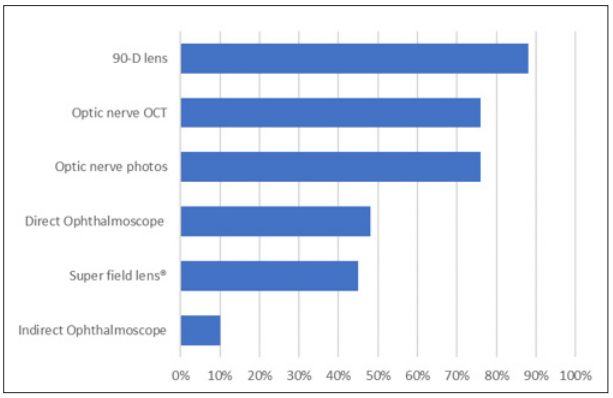

Figure 2. Optic nerve assessment technique (multi-response) among PGS member-respondents (2016)
**PGS: Philippine Glaucoma Society, OCT: Optical coherence tomography*

Pachymetry was routinely requested by 18 (43%) of the respondents while 23 respondents requested it at varying frequencies. Two PGS members reported not using this method (Table 2). Among those who use pachymetry, the top reason for requesting it was borderline glaucoma (48%). Other reasons included clinical scenarios where this diagnostic modality will affect management (ocular hypertension, normal tension glaucoma, post-refractive surgery patients, suspicious progression on low pressures) (Table 2).

Most of the respondents believed that the top three tests that should be included in a glaucoma package are: VFE, optic nerve OCT (optical coherence tomography), and optic nerve head photo (Table 2).

For angle-closure glaucoma, the factors that 72% of respondents looked at prior to treatment initiation were: elevated IOP (>21 mmHg), optic nerve cupping, VF loss, and RNFL thinning by OCT. All of the respondents used gonioscopy as the basis for recommending laser iridotomy (LI) to address appositional angle closure. In this regard, half (53%, n = 23) used gonioscopy solely as basis for LI, while the other half used adjunctive examinations such as Van Herick technique and AS-OCT as well. Appositional angle closure (100%) was the top indication for LI, followed by history of previous angle closure (98%, n=41), peripheral anterior synechiae (88%, n=37), or the presence of risk factors for angle closure (67%, n=28) among others (Table 3). As for the preferred LI sites, 31% (n=13) chose an area where the iris was thinnest or where iris crypts were present. Majority (57%, n=24) chose a clock hour that was covered by the upper

lid (10 to 2 o'clock position), while only 12% (n=5) placed the LI in the nasal or temporal clock hours (Figure 3).

Table 3. Treatment practice patterns among PGS member-respondents (2016)

Indications for LI	Frequency	Relative frequency
Documented appositional or near appositional closure	42	100%
Peripheral anterior synechiae (PAS)	37	88%
Increased segmental trabecular meshwork pigmentation	15	36%
History of previous angle closure	41	98%
Positive provocative test result	23	55%
Significant risk of angle closure (AC depth of less than 2.0 mm, strong family history)	28	67%
Others	4	9%
Reasons for not doing LTP	Frequency	Relative frequency
I don't believe in SLT/ALT	1	6%
Expensive for patients	5	31%
Don't know how / lacked training	1	6%
Don't own / no access	4	25%
Other	5	31%
Intraoperative use of antimetabolites	Frequency	Relative frequency
Almost always (>90% of the time)	40	95%
75% of the time	2	5%
50% of the time	0	0%
25% of the time	0	0%
Never	0	0%

**PGS: Philippine Glaucoma Society, LI: Laser iridotomy, AC: Anterior chamber, LTP: Laser trabeculoplasty, SLT/ALT: Selective/Argon laser trabeculoplasty*

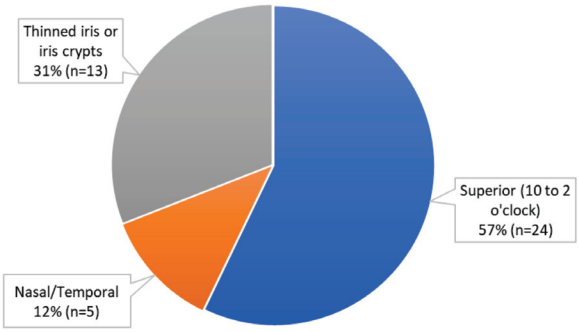

Figure 3. Laser iridotomy (LI) site preferences among PGS member-respondents (2016)
**PGS: Philippine Glaucoma Society*

Argon laser peripheral iridoplasty (ALPI) was performed by 86% of respondents for eyes with narrow angles on gonioscopy or AS-OCT despite having patent iridotomies. Other reasons for performing ALPI in decreasing order were: documented appositional or near appositional closure, significant risk for angle closure (family history and central anterior chamber depth of <2.0 mm), history of previous angle closure, peripheral anterior synechiae (PAS), positive provocative test, and increased segmental trabecular meshwork pigmentation.

When dealing with patients diagnosed with open-angle glaucoma, 93% had a threshold of two or more of the following reasons to initiate treatment: elevated IOP (>21 mmHg), optic nerve cupping, VF loss, and RNFL thinning by OCT. Prostaglandin analogues (PGAs) were ranked as the top choice for first-line monotherapy. Majority of the respondents would also opt to do laser trabeculoplasty (LTP) as an adjunct (55%), adjunct and initial therapy (42%), or as initial mode of therapy (3%). Selective laser trabeculoplasty (SLT – 36%, n=15) was the more frequent LTP choice over argon laser trabeculoplasty (ALT – 14%, n=6) (Figure 4). The cost for patients was cited as the primary reason for respondents who did not offer SLT or ALT (31%, n=5). Other cited reasons for non-usage included the lack of access to a machine (25%, n=4) or the lack of training among others (6%, n=1) (Table 3).

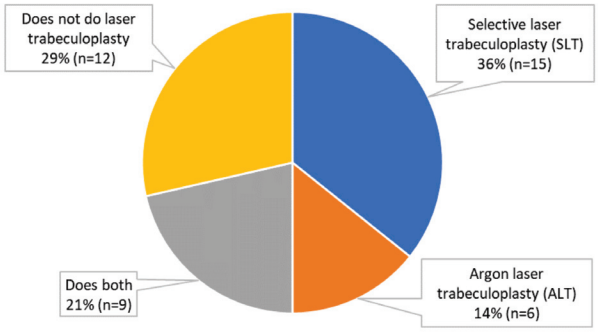

Figure 4. Laser trabeculoplasty (LTP) practices among PGS member-respondents (2016)
**PGS: Philippine Glaucoma Society*

Antimetabolites were reported to be used prolifically by 95% of respondents (n=40) during trabeculectomy procedures (Table 3). Mitomycin-C was the preferred intraoperative antimetabolite for trabeculectomy by 98% of respondents, while 5-fluorouracil (5-FU) was favored by one respondent. Intraoperative exposure to mitomycin-C was done for three or two minutes by 44% (n=18) and 32% (n=13) of respondents respectively. For those who use postoperative antimetabolites, 80% prefer 5-FU as compared to 20% who use mitomycin. Thirty-eight percent (n=16) use 5-FU routinely (>90% of

the time) and 29% (n=12) use it 50% of the time for post-glaucoma surgery procedures such as needling and bleb revision. The reasons cited for occasional use of postoperative antimetabolites are as follows in decreasing order: previously failed trabeculectomy, drug availability, and age of the patient.

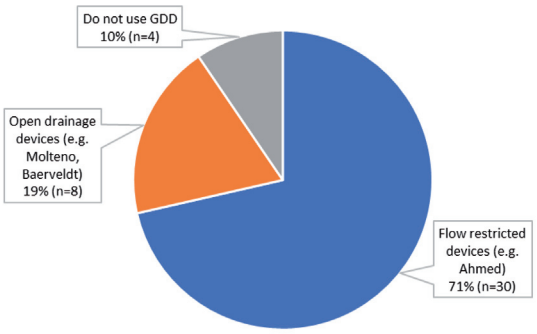

Figure 5. Preferred Glaucoma drainage device (GDD) among PGS member-respondents (2016)
**PGS: Philippine Glaucoma Society*

Majority of the respondents used glaucoma drainage devices (GDD – 91%) as part of their management. Flow-restrictive GDDs such as the Ahmed (New World Medical, Rancho Cucamonga, CA, USA) was favored by more respondents (71%, n=30) over non-restrictive GDDs like the Baerveldt (Abbott Laboratories, Abbott Park, IL, USA) (19%, n=8). The use of GDDs was not employed by 9% (n=4) of respondents (Figure 5). Seventy-seven percent of the respondents expressed interest in performing minimally invasive glaucoma surgeries which was not available yet at the time of the survey.

DISCUSSION

This is the first study to identify the glaucoma clinical practice patterns of the glaucoma specialists in the Philippines using an online poll survey. Previous studies on practice patterns using paper questionnaires have been met with varying response rates (13-78%).[2,4] One study was able to improve feedback using an automated response system involving voting keypads, as attention levels are increased during conferences.[1] Online scientific surveys have been documented to be the most efficient method of conducting a questionnaire-based survey.[6] Our online study has been met with an excellent response rate (97%). In our opinion, the widespread accessibility of the internet and the use of handheld devices and desktop computers made responding to the questionnaire convenient. Furthermore, the need to fill the knowledge gap provided sufficient motivation for the PGS members to participate in the study.

More than half of our respondents defined glaucoma in the presence of glaucomatous optic neuropathy and corresponding visual field loss. This is consistent with the definition set by the 2017 Malaysian Society of Ophthalmology (MSO) and the 2016 Asia-Pacific Glaucoma Society (APGS).[7,8] Thirteen (30%) of the participants still included IOP in the diagnosis of glaucoma. However as stated in the International Council of Ophthalmology (ICO) Glaucoma Guidelines, IOP is only a modifiable risk factor for the development of glaucoma and not part of its definition.[9]

IOP measurement was primarily done by the respondents using the Goldmann applanation tonometer which remains as the reference standard in all clinical guidelines.[7,8,9] Diurnal measurements were only performed by 57% of the respondents, which is understandable, as this examination may prove to be tedious and logistically challenging. The Asia-Pacific guidelines recommend obtaining several IOP readings during the day or at different times during clinic visits to measure baseline IOP before initiating treatment and to monitor medication effect. However, for patients who progress despite acceptable IOP readings during office hours and prior to costly investigations for presumed normal tension glaucoma, a 24-hour IOP measurement is recommended.[8]

Gonioscopy was performed by all respondents on all new patients and by 95% on eyes prior to dilation which is consistent with the guidelines set by the APGS. These guidelines also state that gonioscopy must be done more frequently in angle-closure patients as permanent iridotrabecular contact may occur. Patients with open angles must also receive regular gonioscopy examinations as such angles may eventually narrow from iris bowing or increasing lens size.[4,8] However, survey results show that only 62% of the respondents performed gonioscopy on follow-up.

The diagnostic examinations employed by respondents included IOP measurement, optic nerve assessment and RNFL thickness scans to evaluate structure, and VF tests to assess function. Majority (88%) of the respondents adhere to the APGS recommendation that the optic nerve is best assessed

using the slit lamp with a 90D lens. Other means of examinations stated were stereophotographs and optic nerve OCTs. Supplementing subjective tests with objective disc assessments ensures that accurate observations are made and that inter/intra-observer variation is minimized.[10] VF examinations were also regularly requested by our respondents to test for patient functionality.[11] The combination of results from these structural and functional tests improves detection of glaucoma and can help the clinician decide on the appropriate treatment.[12]

The use of ancillary examinations such as pachymetry and AS-OCT was not widely utilized by our respondents as this was only requested regularly by 43% and 12%, respectively. Pachymetry is recommended for eyes with ocular hypertension and normal tension glaucoma.[8] The MSO suggests to do AS-OCT to increase detection in eyes suspected to have angle closure; however, this is based only on level three evidence.[7] Most of our respondents stated that they would rely more on their gonioscopy findings rather than requesting an AS-OCT scan. Furthermore, our survey shows a paucity on the usage of pachymetry and AS-OCT as these tests are only available in limited centers and would only add cost for the patient.

The diagnosis of appositional angle closure, whether through gonioscopy alone or in conjunction with Van Herick technique or AS-OCT, was managed by our respondents with LI which is consistently recommended by several guidelines.[7,8,9] Evidence suggests that LI increases angle width in all stages of primary angle closure and may have a favorable IOP effect in eyes without extensive angle damage. In eyes that underwent LI which are considered as primary angle closure (PAC) or primary angle closure suspects (PACS), progression to glaucoma is reportedly uncommon.[13] A 2008 study in Singapore showed that, in contrast to institutional/academic ophthalmologists, private practitioners were found to recommend LI less often for PACS. It is believed that this difference is related to cost-effectivity of early cataract surgery over LI for PACS.[14] The opinion of our respondents on early cataract surgery over LI was not taken in this survey and may be a point of interest in future studies.

As for the site of LI placement, majority of the respondents (57%) chose a site which was covered by the upper eyelid (10 to 2 o'clock position). It is our impression that this preference is borne out of conventional knowledge which suggests that the occurrence of dysphotopsias is less often in eyes with fully-covered LIs compared to eyes with partially-covered or exposed LIs.[15,16] However, this notion was refuted by a recent prospective study which showed that eyes with superior LIs (whether fully or partially exposed) were 3.6 times more likely to have visual disturbances than eyes with temporal LIs. This finding was attributed to a tear prism effect at the lid margin which redirects light onto the retina producing unwanted visual dysphotopsias.[17] We assume that the minority of our respondents (12%) who chose the temporal/nasal sites based their preference on this latest study; however, this was not validated in our questionnaire. The APGS guidelines state that iridotomies may be located in any quadrant, but care should be taken to place the iridotomies peripherally.

PGAs were the most common choice for first-line monotherapy in open-angle glaucoma by our respondents. This is consistent with the MSO and APGS guidelines as this drug class offers the highest IOP-lowering effect and enhances compliance due to its once-daily dosing.[4,18] The MSO guidelines further suggest that medical treatment must be individualized and adjusted according to the target pressure set for each patient.

Laser trabeculoplasty (ALT or SLT) was found to be a frequent intervention of our respondents (71%) for patients with open-angle glaucoma. Previous studies have found that as initial treatment, ALT can lower IOP by as much as 7 to 10 mmHg which is comparable to topical medications.[19] SLT has also been found to be as effective as ALT in lowering IOP but has the advantage of being easier to use due to its larger spot size and is considered to be repeatable, owing its limited damage to the trabecular meshwork.[20,21] This may explain why SLT was the preferred option over ALT for our respondents who do LTP. Recently, the Laser in Glaucoma and Ocular Hypertension (LiGHT) trial has shown that 74.2% of patients with primary open-angle glaucoma and/or ocular hypertension who underwent SLT initially required no drops to maintain target IOP at 36 months.[22]

Mitomycin-C (0.4 mg/mL for 2-3 minutes) was the preferred intraoperative antimetabolite, while 5-FU was the most frequently used postoperative antimetabolite by our respondents. These practices are consistent with the recommendations from several guidelines.[7,8]

Table 4. Summary of PGS member-respondents' practice patterns and general recommendations from various CPGs

	MSO[7]	APGS[8]	ICO[9]		PGS	Remarks
Glaucoma definition	Chronic eye disease that damages the optic nerve and can result in serious vision loss	Group of ON diseases characterized by selective and progressive loss of RGCs. Manifests clinically by thinning and loss of neuroretinal rim, RNFL with corresponding VF loss	Group of diseases in which optic nerve damage is the common that leads pathology to vision loss		GON and evidence of VF loss (51%)	
			Minimal equipment	Optional equipment		
IOP technique	GAT	GAT	GAT, Schiotz	Tono-Pen, Pneumotonometer	Majority use GAT (98%)	Only one chose Tono-Pen
Visual field	Standard automated perimetry (gold standard)	Automated perimetry	Manual or automated perimetry	FDT, SWAP	Humphrey (60%)	31% would use both Humphrey and Octopus
Nerve assessment	SL biomicroscopy (recommended), OCT of RNFL, stereoscopic photo, direct ophthalmoscopy, CSLO	SL examination (60-90D), direct ophthalmoscopy, OCT	Direct ophthalmoscopy, 78D or 90D examination	Fundus photo, OCT, SLP, CSLO	Majority use the 90D lens (88%)	
Angle assessment	VH, gonioscopy (gold standard), AS-OCT (can detect more angle closure than gonioscopy)	Gonioscopy	SL gonioscopy (Goldmann, Zeiss/ Posner lens)	AS-OCT, UBM	All members would perform gonioscopy on all new patients	Only 12% used AS-OCT
Pachymetry	Affects IOP and can aid in management	Can modify how IOP is interpreted	To help interpret IOP readings		Done by 43% only	Requested mainly for eyes with border glaucoma
Diurnal	Should be considered for POAG/NTG suspects	Best obtained by several IOP readings during the day	Record time of IOP measurement to account fo diurnal variation		Done by 57%	Performed mostly only during office hours
			Essential Medicines	Optional Medicines		
OAG treatment (first-line)	PGA (highest IOP-lowering effect)	First choice monotherapy for either open or closed-angle glaucoma: PGA (can also be β-blockers, CAIs, α-agonists or others)	Topical: Latanoprost, Timolol Systemic: Oral and IV ACTZ	Topical: PGA, β-blockers, CAIs, α- agonists, Fixed combination drugs Systemic: Methazo-lamide, glycerol	PGA	
LTP	ALT or SLT (no significant difference in adverse events between the two)	ALT, SLT or DLT (ALT and SLT have similar efficacy)	ALT or SLT		Majority used SLT (36%)	Major deterrent for non-usage was additional expense for patient (31%)
LI indication	To relieve pupillary block As relative indication for eyes due for repeated dilation, poor access to eye care, and confirmed family history of PACG	Effective in relieving pupillary block	Pupillary block (iris-trabecular contact, iris bowing) Plateau iris (iris-trabecular contact, flat iris)		Appositional closure (100%)	
LI site		Superior quadrants but temporal iridotomy may reduce visual symptoms	Peripheral iris		Most prefer superior clock hours (57%)	Only 12% placed the LI in the nasal or temporal clock hour
ALPI	Initial treatment in AAC attack or modification of iris contour	Flatten peripheral iris, widen anterior chamber inlet, break AAC attack	Used also to address pupillary block and plateau iris configuration		Done by 86%	For eyes with narrow angles on gonioscopy or AS-OCT despite having patent LIs.
Antimetabolite (intraoperative)	MMC	MMC, 5-FU largely superseded by MMC	MMC		MMC (98%)	One respondent used 5-FU intraoperatively
Antimetabolite (postoperative)	5-FU	5-FU			5-FU (80%)	Used during bleb needling or revision procedures
GDD	Ahmed, Baerveldt, Molteno	Ahmed, Baerveldt, Molteno, AADI			Ahmed (71%)	

** PGS : Philippine Glaucoma Society , CPG: Clinical practice guidelines, MSO: Malaysian Society of Ophthalmology, APGS: Asia-Pacific Glaucoma Society, ICO: International Council of Ophthalmology, ON: Optic nerve, RGC: Retinal ganglion cells, RNFL: Retinal nerve fiber layer, VF: Visual field, GON: Glaucomatous optic neuropathy, IOP: Intraocular pressure, GAT: Goldmann applanation tonometry, SL: Slit lamp, OCT: Optical coherence tomography, CSLO: Confocal scanning laser ophthalmoscopy, SLP: Scanning laser polarimetry, VH: Van Herick technique, AS-OCT: Anterior segment OCT, UBM: Ultrasound biomicroscopy, POAG: Primary open-angle glaucoma, NTG: Normal-tension glaucoma, OAG: Open-angle glaucoma, PGA: Prostaglandin analogue, CAI: Carbonic anhydrase inhibitor, ACTZ: Acetazolamide, LTP: Laser trabeculoplasty, ALT/SLT/DLT: Argon/Selective/Diode laser trabeculoplasty, LI: Laser iridotomy, PACG: Primary angle-closure glaucoma, ALPI: Argon laser peripheral iridoplasty, AAC: Acute angle closure, MMC: Mitomycin-C, 5-FU: 5-Fluorouracil, GDD: Glaucoma drainage device, AADI: Aravind aqueous drainage implant*

Ninety-one percent (91%) of our respondents use GDDs in their practice. Valved or flow-restricted devices such as Ahmed is preferred over the non-valved Baerveldt. The Ahmed versus Baerveldt study found that both GDD types are effective in reducing IOP (Ahmed – 47% vs. Baerveldt – 57% reduction) and lowering mean glaucoma medication use for as long as five years. The cumulative failure rate was slightly higher for the Ahmed group compared to the Baerveldt group (53% vs. 40%). However, Baerveldt was associated with a risk of hypotony (4%) which was not seen in Ahmed.[23] Additionally, 9% of the respondents do not use GDDs. The reason for its preference or non-utilization was not asked in the questionnaire. Likewise, surgical outcomes and complications of GDDs were not included in this survey.

The practice patterns of the PGS members alongside the general recommendations from published international practice guidelines mentioned here are summarized in Table 4.

CONCLUSION

Majority of the practices of our respondents appeared to adhere to the current clinical practice guidelines. However, studies based on surveys are prone to recall bias which may have influenced the responses of our specialists instead of directly observing their practices.[24] Responses in this survey were also limited given that options were presented in multiple choice format.

The population of respondents was limited to the PGS members at the time of the survey. As such, the results of this survey may not be representative of the glaucoma management delivered by various sectors in the Philippines. Nonetheless, this survey offers other eye care specialists an opportunity to compare their current glaucoma management with their colleagues in the PGS and identify areas that need more research.

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