Glaucoma Care and Clinical Profile in Priest Hospital, Thailand

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Objective: *To assess the prevalence, mechanism and status of glaucoma, and to investigate the magnitude of visual impairment from glaucoma and its relating factors in Buddhist priest and novices.*
Material and Method: *Cross-sectional study of 190 patients treated in Glaucoma service, Priest hospital was performed. One hundred thirty seven patients with glaucoma and suspected glaucoma had comprehensive ophthalmic examination included interview on medical and ocular history, visual acuity, applanation tonometry, gonioscopy, optic disc, visual field evaluation, and retinal nerve fiber layer thickness measurement (Stratus Optical Coherence Tomography; Stratus OCT).*
Results: *Glaucoma was diagnosed in 106 (77%) patients (181 eyes); 31 patients (23%) were glaucoma suspects. Open angle glaucoma (OAG) was found in 53 (50%) cases and classified into 36 (33%) primary open angle glaucoma and 17 (16%) normal tension glaucoma (NTG). Five (4.6%) patients had pseudoexfoliative glaucoma, 24 (23%) had primary angle-closure glaucoma (PACG), 10 (9.4%) had angle-closure glaucoma secondary to other causes (SACG), seven (6.6%) had secondary open angle glaucoma and seven (6.6%) were diagnosed of juvenile glaucoma. Among 31 glaucoma suspects, 18 cases were diagnosed based on disc appearance, eight based on intraocular pressure (IOP), two based on visual field and three cases had primary angle closure (PAC). The prevalence of glaucoma increased with age, with the highest prevalence (33%) in the age range 71 to 80 years. The Glaucoma service of Priest hospital diagnosed glaucoma in 53% of the priest. Rate of glaucoma was higher in priest from rural area than those from Bangkok and urban area. The mean baseline IOP was 26.5 ± 14.7 mmHg. The mean treated IOP was 14.5 ± 7.9 mmHg. The average mean deviation (MD) was -14.45 ± 11.11. OCT showed average RNFL thickness of 70.8 ± 35.6 µm. Glaucoma medications was received by 72% of the priest, 18% had laser treatment, and 22 % had glaucoma surgery. At diagnosis, two patients were blind according to WHO criteria, 29 (28%) patients were unilaterally blind, and seven (6.5%) had low vision. After treatment, 31 (29%) patients had unilateral blindness and none had bilateral blindness. The main associated diseases were hypertension, dyslipidemia, and diabetes. Transportation and financial condition were the major barriers in receiving eye care.*
Conclusions: *OAG comprised 50% of all glaucoma, 23% of PACG, and 16% of all subtypes of secondary glaucoma. The prevalence of glaucoma in priest rose significantly with age. In the treated glaucoma patients, 47% retained good visual outcome. Delayed diagnosis was a major factor for unsatisfactory outcome as 28% of patients had monocular blindness at diagnosis and 53% were previously unaware of their disease.*

Keywords: *Glaucoma, Intraocular pressure, Blindness, Low vision*

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Glaucoma is the second leading cause of blindness worldwide[1]. The difference between glaucoma and the leading cause of blindness; cataract is that blindness from the former is irreversible, but can be avoidable. At present, the marked increase in the size of the elderly population with their greater propensity for visual disability presents a challenge. It is estimated that the number of bilateral blindness will

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be 8.4 million in 2010 and increasing to 11.1 million in 2020. Asians will comprise 47% of glaucoma globally[2]. Since 1997, the Department of Ophthalmology, Priest hospital has established Glaucoma clinic for treating Buddhist priest, novices and the public with glaucoma. Nevertheless, some imperative data that help improve the patient's care have not been inspected. Among these are the magnitude of glaucoma, the stages of glaucoma at presentation, proper investigations for glaucoma patients, the coverage and quality of glaucoma service, outcome of the treatment and factors that may influence outcome, and therapeutic delay. The present study aimed to identify prevalence, mechanism, and status of glaucoma, to assess the magnitude of visual impairment from glaucoma, and its influential factors. In addition, the quality of glaucoma practice and the therapeutic outcome were also assessed.

Material and Method

Cross-sectional study of patients treated in glaucoma service, Department of Ophthalmology, Priest hospital between October 2005 and September 2007 was performed. The chart review of 190 patients was done. Patients who were diagnosed with glaucoma and suspected glaucoma were included and appointed for comprehensive ophthalmic examination. Each patient signed the informed consent. The protocol included interview of medical history and ocular history i.e. current glaucoma medications, previous laser and ocular surgery, and the results of treatment. Ophthalmic examination included visual acuity testing, refraction, Goldmann applanation tonometry, slit-lamp biomicroscopy, gonioscopy, optic nerve head examination, and 15 degree stereo disc photography (Nidek 3-DX/F, Nidek, Chiyoda-ku, Japan). Visual field testing program 30-2 (Humphrey Field Analyzer; HFA, Carl Zeiss Meditec, Dublin, CA) was performed. The first reliable visual field in each patient was evaluated. Retinal nerve fiber layer (RNFL) analysis (Stratus Optical Coherence Tomography; Stratus OCT™, Carl Zeiss Meditec, Dublin, CA) was done in all cases. Glaucoma status was determined by a consensus adjudication of intraocular pressure measurement, gonioscopic and optic disc evaluation, visual field testing, and RNFL analysis from Stratus OCT™. Patients who could not come for examination or were lost in follow-up were included if the last complete ophthalmic examination was obtained within the study period.

Glaucoma was classified into five severity stages according to mean deviation (MD)[3]. Stage 0: No or minimal defect, Stage 1: Early defect was defined as cases with MD of equal to or more than -6.00 decibels (dB). Stage 2: Moderate defect was defined as cases with MD of -6.01 to -12.00 dB. Stage 3: Advanced defect was defined as cases with MD of -12.01 to -20.00 dB. Stage 4: Severe defect was defined as cases with MD of less than -20.00 dB. Stage 5: End-stage disease was defined as cases with eye that was unable to perform visual fields.

Blindness according to WHO criteria[4] was defined as visual acuity of less than 20/400, or corresponding visual field loss to less than 10 degrees, in the better eye with best possible correction. Low

Table 1. Demographics of glaucoma patients in Priest Hospital

Demographics	
Age (years)	
mean (SD)	64 (16)
range	18-91
Sex (Male : Female)	129:8
Duration of glaucoma (months)	
mean (SD)	46 (55)
range	2-408
Family history of glaucoma	5 (4.6%)
Associated diseases (n, %)	34 (25%)
Hypertension	20 (14.6%)
Dyslipidemia	20 (14.6%)
Diabetes	17 (12.4%)
Ischemic heart disease	6 (4.4%)
Cerebrovascular disease	4 (2.9%)
Residential area	
Bangkok and Urban : Rural	57 : 80 (42% : 58%)

Table 2. Distribution of types of glaucoma according to disease mechanism

Diagnosis	Patients (n)
Open angle glaucoma (OAG)	53 (50%)
• Primary open angle glaucoma (POAG)	36 (34%)
• Normal tension glaucoma (NTG)	17 (16%)
Primary angle-closure glaucoma (PACG)	24 (23%)
• Chronic angle-closure glaucoma (CACG)	21 (19.8%)
• Acute angle-closure glaucoma (AACG)	3 (2.8%)
Secondary open angle glaucoma (SOAG)	7 (6.6%)
Secondary angle-closure glaucoma (SACG)	10 (9.4%)
• Neovascular glaucoma (NVG)	9 (8.5%)
• Others	1 (0.94%)
Pseudoexfoliation glaucoma	5 (4.7%)
Juvenile and developmental glaucoma	7 (6.6%)

vision according to WHO criteria was defined as visual acuity of less than 20/60, but equal to or better than 20/400, or corresponding visual field loss to less than 20 degrees, in the better eye with best possible correction.

Mean, standard deviation (SD) and confidence interval (CI) were calculated. Paired Student t-test was used to analyze the difference in IOP between medically-treated and surgically-treated group. *p*-value of less than 5% was considered statistically significant. All statistical analysis was performed using the commercially available software SPSS (version 13.0, SPSS Inc., Chicago, IL).

Results

One hundred thirty seven patients with glaucoma and suspected glaucoma were eligible and included in this study. Glaucoma was diagnosed in 106 (77%) patients (181 eyes). The other 31 (23%) patients were glaucoma suspects. Mean age of glaucoma patients was 64 ± 16 years. Mean duration of glaucoma was 46 ± 55 months. The associated diseases were hypertension, dyslipidemia, diabetes, ischemic heart disease, and cardiovascular disease. Patient demographics were displayed in Table 1.

Among diagnozed glaucoma patients, 57 (53%) patients had not been diagnosed previously. Open angle glaucoma (OAG) was diagnosed in 53 (50%) patients. OAG was classified into 36 (34%) of primary open angle glaucoma (POAG), and 17 (16%) of normal tension glaucoma (NTG). Five (4.7%) patients had pseudoexfoliative glaucoma. Twenty-four (23%) had primary angle-closure glaucoma (PACG), which comprised of three cases of acute angle-closure glaucoma and 20 chronic PACG cases. Ten (9.4%) cases had angle-closure glaucoma secondary to other causes (SACG), which include seven patients, (6.6%) with neovascular glaucoma and three patients with other causes (2.8%). Only seven (6.6%) patients had secondary open angle glaucoma from trauma and intravitreal triamcinolone injection. Seven patients (6.6%) were juvenile glaucoma.

Among glaucoma suspect patients, 18 were diagnosed based on disc appearance, eight based on IOP, two based on visual field, and three based on primary angle closure (PAC). Table 2 overviewed proportion of types of glaucoma.

The prevalence of glaucoma increased with age, from 3.7% in age range from 41 to 50 years, to 13.9% in age range from 51 to 60 years, to 25% in age range from 61 to 70 years, and 33% in age range from 71 to 80 years (Table 3).

The mean baseline intraocular pressure (IOP) was 26.5 ± 14.7 mmHg. The mean treated IOP was 14.5

Table 3. Distribution of glaucoma patients according to age group

Age group (years)	Number of examined patients	Number of glaucoma diagnosed
Less than 11	0 (0%)	0 (0%)
11-20	2 (1.5%)	1 (0.9%)
21-30	7 (5.1%)	5 (4.6%)
31-40	8 (5.8%)	4 (3.7%)
41-50	4 (2.9%)	4 (3.7%)
51-60	24 (18%)	15 (14%)
61-70	36 (26%)	27 (25%)
71-80	41 (30%)	36 (33%)
More than 80	15 (11%)	14 (13%)
Total	137 (100%)	106 (100%)

Examined patients = compose of glaucoma and glaucoma suspect patients

Table 4. Parameters in glaucoma according to subtypes

	POAG	NTG	PACG	Total
Baseline IOP (mmHg)	26.6 ± 4.9	18.6 ± 2.5	27.1 ± 7.8	26.5 ± 14.7
Treated IOP (mmHg)	12.9 ± 5.9	13.2 ± 3.1	12.6 ± 5.7	14.5 ± 7.9
• Controlled group				12.9 ± 5.8
• Uncontrolled group				25.2 ± 6.9
Mean vertical cup:disc ratio	0.79 ± 0.18	0.77 ± 0.14	0.85 ± 0.16	0.74 ± 0.28
Mean deviation (dB)	-15.60 ± 10.86	-12.12 ± 6.21	-20.37 ± 10.79	-14.45 ± 11.11
Mean RNFL thickness (μm)	58.07 ± 21.81	76.07 ± 16.97	47.50 ± 14.41	70.81 ± 33.12

± 7.9 mmHg. Mean treated IOP in well-controlled cases of all types of glaucoma was 12.9 ± 5.8 mmHg, while mean treated IOP in poorly-controlled and non-compliant cases was 25.2 ± 6.9 mmHg (Table 4). The barriers in coming for treatment were transportation and financial condition.

POAG had the highest mean cup/disc ratio (CDR) of 0.78, while NTG had the highest mean CDR of 0.77. The difference CDR between two eyes of 0.02 and 0.01 was found in POAG and NTG, respectively. OCT showed average RNFL thickness of 70.81 ± 33.12 microns (Table 4).

Regarding the visual field results, 131 visual fields (85 patients) were eligible. The average mean deviation (MD) was -14.45 dB ± 11.11 dB. When considering glaucoma severity based on MD; 41 eyes (29%), 28 eyes (20%), 14 eyes (10%) and 48 (37%) had early, moderate, advanced and severe defects, respectively. Twelve eyes (9%) were considered endstage disease due to poor visual acuity and inability to perform visual fields (Table 5).

Ninety-nine (72%) patients received glaucoma medications, 25 (18%) had combined laser treatment with medications, and 30 (22%) had filtering and tube shunt surgeries after medication failure. Mean baseline IOP in surgically-treated group was higher than that of medically-treated group, with mean IOP of 30.7 mmHg vs. 26.5 mmHg, respectively (p = 0.02). Conversely, after glaucoma therapy, mean treated IOP of patients who underwent glaucoma surgeries was lower than IOP in medically-treated group, with mean treated IOP of 10.9 mmHg vs. 15.9 mmHg, respectively (p = 0.001) (Table 6).

Visual acuity at presentation and at the last follow-up visit was demonstrated in Table 7. Fifty (47%) glaucoma patients (94 eyes, 51%) retained good visual acuity in at least one eye at last follow-up. All glaucoma suspects had good visual outcome.

With respect to visual impairment from glaucoma, two patients were bilaterally blind from PACG and JOAG. Twenty-nine (28%) patients had unilateral blindness and seven (6.5%) had low vision according to WHO criteria. After treatment, 31 (29%) patients had unilateral blindness, none of unilaterally blind or low vision patients turned blind bilaterally and the rate of low vision did not increase (7 cases, 6.5%). PACG and SACG were the most frequent cause of unilateral blindness, followed by POAG and JOAG (Table 8).

Discussion

In the present study, OAG was found to be the most frequent glaucoma subtype followed by PACG and secondary glaucoma. This is consistent with the previous population-based study in Thailand[5], but in contrary to other studies from Singapore, Mongolia and South India that showed more prevalence of PACG[6-8]. However, PACG appeared to be a major cause of blindness and low vision in comparison to POAG as shown in the present study and previously reported[9,10].

Interestingly, there was substantial proportion of priest diagnosed with secondary angle-closure glaucoma (SACG). More specifically, neovascular glaucoma (NVG) caused by proliferative diabetic retinopathy (8 eyes) and central retinal vein occlusion (2 eyes). Nine of ten NVG eyes were legally blind at diagnosis with only one eye retained useful vision

Table 5. Glaucoma Stages Based on Visual Field Mean Deviation (MD) of types of glaucoma

Stage	POAG (eyes,%)	NTG (eyes,%)	PACG (eyes,%)	Others (eyes,%)	Total (eyes,%)
No or minimal defect	0	0	0	28*	28
EarlyMD ≥ -6.00 dB	14 (25%)	2 (10%)	3 (12%)	22 (42%)	41 (26%)
Moderate MD -6.01 to-12.00 dB	10 (18%)	8 (38%)	4 (15%)	6 (12%)	28 (18%)
Advanced MD ≤ -12dB to -20.00 dB	5 (9%)	6 (29%)	1 (4%)	6 (12%)	18 (12%)
Severe MD ≤-20.00 dB	22 (39%)	3 (14%)	14 (54%)	9 (17%)	48 (31%)
End-stage diseaseUnable to perform VF	6 (10%)	2 (10%)	4 (15%)	9** (17%)	21 (13%)
Mean MD, dB (SD)	-15.59 (10.86)	-12.12 (6.21)	-20.37(10.79)	-6.37 (2.65)	-14.45 (11.11)

Percents calculated not including stage 0 (no or minimal defect)
* Glaucoma suspect
** Neovascular glaucoma

(Snellen VA of 20/100) after treatment. Since 25% of all glaucoma patients had been treated with one or more chronic associated diseases, it is essential to provide eye health education among these patients and emphasize the importance of getting regularly comprehensive eye exam. This can be accomplished by employing multidisciplinary approach for patients with chronic medical conditions who are at greater risk of developing glaucoma and other visual-threatening diseases for example aged patients and patients with cardiovascular diseases or diabetes.

Previous reports suggested that noncompliance to treatment regimen and late presentation were significant risk factors for blindness from OAG[11,12]. The authors found similar findings as 39% and 10% of POAG presented with severe visual field defect (MD equal or less than -20 dB)[3] and end stage disease (unable to perform visual field)[3], respectively. Although specific factors for blindness from ACG have not been reported, the authors speculated that delayed diagnosis also played an important role for visual impairment because higher proportion of ACG patients compared to those of OAG were in severe and end-stage disease at diagnosis. In addition, priests and novices from remote area were among those who had late presentation or poor compliance for glaucoma follow-up. The main compliance barriers appeared to be transportation and financial condition.

Reduction of IOP, which is the well-established therapeutic and preventive factor in glaucoma deterioration[13-16], was achieved in both medical and surgical treatment group in the present study. However, the analysis showed significant IOP reduction in surgically treated eyes than those medically treated. There was some evidence that initial medication (pilocarpine) was associated with greater

Table 6. Comparison of baseline pre-treated IOP and treated IOP at last follow-up based on medical treatment vs. surgical treatment group

	Medical treatment	Surgical treatment	p-value
Baseline IOP	26.5	30.7	0.01
Treated IOP	15.9	10.9	0.001
IOP reduction	10.6 (37.7%)	20.2 (65.8%)	0.0000

Table 7. Best corrected Snellen visual acuity of all glaucoma eyes

Visual acuity	At presentation (eyes, %)	At last visit (eyes, %)
20/20 – 20/40	87 (48%)	82 (45.3%)
20/50 – 20/60	11 (6.1%)	12 (6.6%)
20/70 – 20/100 (low vision)	38 (21%)	44 (24.3%)
20/200 – 10/200 (low vision)	10 (5.5%)	6 (3.3%)
9/200-Count finger (blind)	14 (7.7%)	14 (7.7%)
Hand motion (blind)	6 (3.3%)	7 (3.8%)
Light perception (blind)	1 (0.6%)	2 (1.2%)
No Light perception (blind)	14 (7.7%)	14 (7.7%)
Total	181 (100%)	181 (100%)

Percents calculated not including glaucoma suspect eyes

Table 8. Distribution of blindness and low vision based on glaucoma subtypes

	Bilateral blindness (n)		Unilateral blindness (n)		Bilateral low vision (n)		Unilateral low vision (n)	
	Baseline	Last visit	Baseline	Last visit	Baseline	Last visit	Baseline	Last visit
POAG	0	0	7	7	4	4	5	7
NTG	0	0	1	1	0	0	2	3
PACG	1	1	7	9	3	3	5	5
SOAG	0	0	0	1[a]	0	0	6[b]	4[c]
SACG	0	0	9[d]	9[d]	0	0	0	0
JOAG	1	1	4	4	0	0	0	0
Total	2	2	29	31	7	7	18	19

a = Traumatic glaucoma
b = Traumatic glaucoma (n = 4), Pseudoexfoliation syndrome (n = 1), Post retinal surgery (n = 1)
c = Traumatic glaucoma (n = 2), Pseudoexfoliation syndrome (n = 1), Post retinal surgery (n = 1)
d = Neovascular glaucoma

risk of visual filed progression than surgery in severe OAG, although this hasn't been confirmed in newer medications e.g. prostaglandin analogs, carbonic anhydrase inhibitor[17]. Given that most of the priests presented at the late stage, the authors thus proposed that more aggressive therapy. As example, laser or surgical procedures early in the course of treatment may be applied in specific cases such as moderate to advanced glaucoma damage, patients with therapeutic compliance difficulties such as no-show for follow-up visits, priests in rural area, and priests with limited selfcare or chronic diseases.

The major drawback of the present study was that it was performed in predominant elderly males with unique life-style in the hospital-based setting. Generalization of this data may not be applicable. Nevertheless, the authors see the value of this work as being a source of much needed data in glaucoma profiles and useful information, with the aim to assess and improve the quality of glaucoma care.

The disturbing finding from the present study was a large proportion of advanced to end-stage disease at presentation as approximately one-third of the patients were monocular blind according to WHO visual acuity and visual field criteria, and 6.5% of cases had low vision. The blindness prevention policy must urge the importance of glaucoma public awareness and cost-effective targeted screening programs in high-risk patients as in aging Buddhist priests in Thailand.

Conclusion

OAG comprised 50% of all glaucoma, 23% of PACG and 12% of secondary glaucoma. The prevalence of glaucoma in priest rose significantly with age. Seventy one percent of the treated patients retained good visual outcome. However, delayed diagnosis was a major factor for unsatisfactory outcome as 28% of patients had monocular blindness at diagnosis. In addition, as much as 53% were previously unaware of their disease. These findings emphasized the importance of glaucoma screening and public awareness as the population age.

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ต้อหินในพระสงฆ์และสามเณร

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วัตถุประสงค์: *เพื่อทราบอัตราการเกิด ชนิดและความรุนแรงของโรคต้อหิน รวมทั้งระดับสายตา และปัจจัยที่ทำให้พระสงฆ์สามเณรที่มีต้อหินสูญเสียการมองเห็นในโรงพยาบาลสงฆ์*

วัสดุและวิธีการ: *คณะผู้วิจัยศึกษาพระสงฆ์และสามเณรรวมถึงบุคคลทั่วไปที่มารับการรักษาที่คลินิกโรคต้อหิน ระหว่างเดือนตุลาคม พ.ศ. 2549 - กันยายน พ.ศ. 2550 จำนวน 190 ราย พบผู้ป่วย 137 รายที่เป็นโรคต้อหินและผู้ป่วยสงสัยโรคต้อหิน ผู้ป่วยได้รับการตรวจตาโดยละเอียด รวมถึงการวัดลานสายตา (Automated perimetry) และการวัดความหนาของใยประสาทตา (Stratus OCT)*

ผลการศึกษา: *พบผู้ป่วยโรคต้อหิน 106 ราย ผู้ป่วยสงสัยโรคต้อหิน (Glaucoma suspect) 31 ราย ในกลุ่มที่ได้รับการวินิจฉัยว่าเป็นต้อหิน ผลการตรวจมุมตา (gonioscopy) พบต้อหินชนิดมุมเปิด (OAG) 53 ราย (50%) โดยแบ่งเป็นกลุ่มที่มีความดันตาสูง (POAG) 36 ราย (33%) และ ความดันตาปกติ (NTG) 17ราย (16%) ต้อหินชนิด Pseudoexfoliation จำนวน 5 ราย (4.6%) ราย ต้อหินมุมปิดชนิดเรื้อรัง (PACG) 24ราย (23%) ต้อหินมุมปิดชนิดทุติยภูมิ 10 ราย (9.4%) ต้อหินมุมเปิดชนิดทุติยภูมิ (Secondary glaucoma) 7 ราย (6.6%) ต้อหินในพระสงฆ์อายุน้อย 7 ราย (6.6%) จากพระสงฆ์สงสัยต้อหิน 31 ราย วินิจฉัยจากลักษณะขั้วประสาทตา 18 ราย จากความดันตาสูง (Ocular hypertension) 8 ราย จากลานสายตาสงสัยความผิดปกติ 2 ราย และพระสงฆ์มีแนวโน้มจะเกิดต้อหินเฉียบพลันจากมุม ม่านตาแคบ (Primary angle closure) 3 ราย อัตราการเกิดโรคต้อหินเพิ่มขึ้นตามอายุ โดยช่วงอายุที่พบต้อหินมากที่สุด อยู่ในช่วงอายุระหว่าง 71-80 ปี มีพระสงฆ์ถึงร้อยละ 53 ที่ไม่เคยได้รับการวินิจฉัยว่าเป็นต้อหินมาก่อนโดยเฉพาะ พระสงฆ์ที่จำพรรษาในที่ต่างจังหวัดที่ห่างไกล ความดันตาเฉลี่ยก่อนการรักษา 26.5 $\pm$ 14.7 มม.ปรอท ความดันเฉลี่ยหลังการรักษา 14.5 $\pm$ 7.9 มม.ปรอท ค่าเฉลี่ยของ Mean deviation จากการวัดลานสายตาคือ -14.45 $\pm$ 11.11 เดซิเบล ค่าความหนาของใยประสาทตาเฉลี่ย คือ 70.8 $\pm$ 35.6 ไมครอน พระสงฆ์ได้รับการรักษา โดยยาอย่างเดียว 72% โดยยาและเลเซอร์ 18% และโดยการผ่าตัด 22% ตามเกณฑ์การวินิจฉัยโรคขององค์การ อนามัยโลก พบพระสงฆ์ตาบอดทั้งสองตาเมื่อแรกวินิจฉัยจำนวน 2 ราย ตาบอดหนึ่งข้าง 29 ราย และ มีสายตาเลือนราง ทั้งสองตา 7 ราย หลังได้รับการรักษาพบพระสงฆ์ตาบอดหนึ่งข้าง 31 ราย และจำนวนพระสงฆ์ตาบอดสองตา และสายตาเลือนรางไม่เพิ่มขึ้น โรคที่พบร่วมได้แก่ โรคความดันโลหิตสูง ไขมันในเลือดสูง และเบาหวาน ปัจจัยที่มีผลให้พระสงฆ์ไม่มาตรวจรักษาคือ การคมนาคมไม่สะดวก และสถานภาพทางเศรษฐกิจ*

สรุป: *พบอัตราการเกิดโรคต้อหินมุมเปิดจำนวน 50% ของพระสงฆ์ที่เป็นต้อหิน ต้อหินมุมปิดชนิดเรื้อรัง 23% ต้อหินทุติยภูมิทั้งชนิดมุมเปิดและมุมปิด 16% ความชุกของการเกิดโรคต้อหินพบมากขึ้นตามอายุ เพียง 47% ของพระสงฆ์มีระดับสายตาอยู่ในเกณฑ์ดี (20/20-20/60) หลังการรักษา การวินิจฉัยที่ล่าช้าเป็นปัจจัยสำคัญที่ทำให้ การรักษาได้ผลไม่ดีเท่าที่ควร โดยพบพระสงฆ์จำนวน 28% ที่ตาบอดหนึ่งข้างเมื่อแรกวินิจฉัยและพระสงฆ์ 53% ไม่เคยตรวจทราบมาก่อนว่าเป็นโรคต้อหิน*