Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 4 (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Study on Efficacy of Treatment Modalities in Angle Closure Glaucoma Patients

Dr. Ujjwala Vennara Varma[1], Prof. Dr. Rubina Huda[2], Prof. Dr. Syed Ali Nasar Waris[*3], Dr. Mohan Ram Kumar[4], Dr. Deborah Rinita[5], Dr. Himaja Singana[6], Dr. M. Rajeshwari[7]

[1]Post Graduate, MS Ophthalmology Final Year, Shri Sathya Sai Medical College & Research Institute, SBV Chennai Campus, Shri Sathya Sai Nagar, Ammapettai, Chengalpattu Dist., Tamil Nadu– 603 108

https://orcid.org/0009-0005-8320-263X

[2]Professor, Department of Ophthalmology, Shri Sathya Sai Medical College & Research Institute, SBV Chennai Campus, Shri Sathya Sai Nagar, Ammapettai, Chengalpattu Dist., Tamil Nadu– 603 108

https://orcid.org/0000-0002-6694-1204

[*3]Professor and HOD, Department of Ophthalmology, Shri Sathya Sai Medical College & Research Institute, SBV Chennai Campus, Shri Sathya Sai Nagar, Ammapettai, Chengalpattu Dist., Tamil Nadu– 603 108

https://orcid.org/0000-0002-1178-9006

[4]Associate Professor, Department of Ophthalmology, Shri Sathya Sai Medical College & Research Institute, SBV Chennai Campus, Shri Sathya Sai Nagar, Ammapettai, Chengalpattu Dist., Tamil Nadu– 603 108

https://orcid.org/0009-0004-5527-5244

[5]Assistant Professor, Department of Ophthalmology, Shri Sathya Sai Medical College & Research Institute, SBV Chennai Campus, Shri Sathya Sai Nagar, Ammapettai, Chengalpattu Dist., Tamil Nadu– 603 108

https://orcid.org/0000-0002-0584-6633

[6]Post Graduate, Department of Ophthalmology, Shri Sathya Sai Medical College & Research Institute, SBV Chennai Campus, Shri Sathya Sai Nagar, Ammapettai, Chengalpattu Dist., Tamil Nadu– 603 108

https://orcid.org/0009-0005-6212-1101

[7]Post Graduate, Department of Ophthalmology, Shri Sathya Sai Medical College & Research Institute, SBV Chennai Campus, Shri Sathya Sai Nagar, Ammapettai, Chengalpattu Dist., Tamil Nadu– 603 108

https://orcid.org/0009-0005-6697-2122

[*]Corresponding Author:

Dr. Syed Ali Nasar Waris

Cite this paper as: Dr. Ujjwala Vennara Varma, Prof. Dr. Rubina Huda, Prof. Dr. Syed Ali Nasar Waris, Dr. Mohan Ram Kumar, Dr. Deborah Rinita, Dr. Himaja Singana, Dr. M. Rajeshwari, (2025) Study on Efficacy of Treatment Modalities in Angle Closure Glaucoma Patients. *Journal of Neonatal Surgery*, 14 (4), 204-208.

ABSTRACT

Angle closure glaucoma, the major cause of blindness, especially in Asian populations, is often caused by a shallow anterior chamber. Indian patients with ACG and shallow AC are examined in this case series in terms of their clinical presentation, treatment, and results. Data from 20 patients were analyzed to provide insights into demographic patterns, clinical features, and treatment efficacy.

Keywords: *Shallow AC, Angle Closure Glaucoma, Glaucoma, ITC, PAS, Gonioscopy, Risk factors, Asian population, Retrospective study, PACS, PAC, PACG, APAC, Treatment Modalities, Efficacy, LPI, Medical Management, Trabeculectomy, Follow up*

1. INTRODUCTION

Angle closure glaucoma is a type of glaucoma brought on by obstruction of the aqueous humor outflow, which can harm the optic nerve and result in blindness. Angle closure glaucoma (ACG) results from appositional or synechial closure of the anterior chamber angle leading to reduction in aqueous outflow facility, IOP elevation, and subsequent damage to the optic

nerve with associated visual field loss. There are primary and secondary forms of angle closure glaucoma . An important risk factor for this condition, which is particularly prevalent in Asian populations, including Indians, is a shallow anterior chamber. [1]. Understanding this demographic's clinical presentation and management outcomes is essential for improving patient care.

2. METHODS

Patient Selection

This study included 20 Indian patients diagnosed with shallow AC and Angle Closure Glaucoma at a tertiary eye care facility between January 2019 and December 2022.

INCLUSION CRITERIA

1. Age ≥ 40 years
2. Diagnosed with ACG based on gonioscopy findings – PACS, PAC or PACG
3. Presence of shallow anterior chamber as determined by gonioscopy along with AS-OCT (Anterior segment Optical Coherence Tomography).
4. Elevated IOP >21mmHg
5. Gonioscopy findings- angle closure or narrow angle (<20 degrees)
6. Visual field loss
7. Informed consent

EXCLUSION CRITERIA

1. Secondary causes of angle closure – plateau iris, NVI, trauma, uveitis, lens subluxation
2. Previous ocular surgery
3. Ocular comorbidities - advanced cataract, diabetic retinopathy etc.
4. Systemic comorbidities, eg, Uncontrolled hypertension, etc.
5. Use of medication that affects IOP without a washout period – eg Miotics, alpha agonists, steroids.
6. No PL vision
7. Inability to provide consent.

Data Collection

Clinical information, such as-

1.Demographics – age, gender, family history of glaucoma

2.Presenting symptoms

3 Visual acuity, slitlamp examination and IOP readings

4.Gonioscopy results

5.Treatment modalities

6.Follow-up outcomes were gathered retrospectively from medical records.

3. TYPE OF STUDY

This study involves the documentation and analysis of data from a group of patients—i.e.,patients with a shallow anterior chamber, angle closure glaucoma, and the modalities of treatment with the patients' response to different modalities of treatment. It is a retrospective study, using data from past medical records.

4. RESULTS

Demographic and Clinical Characteristics

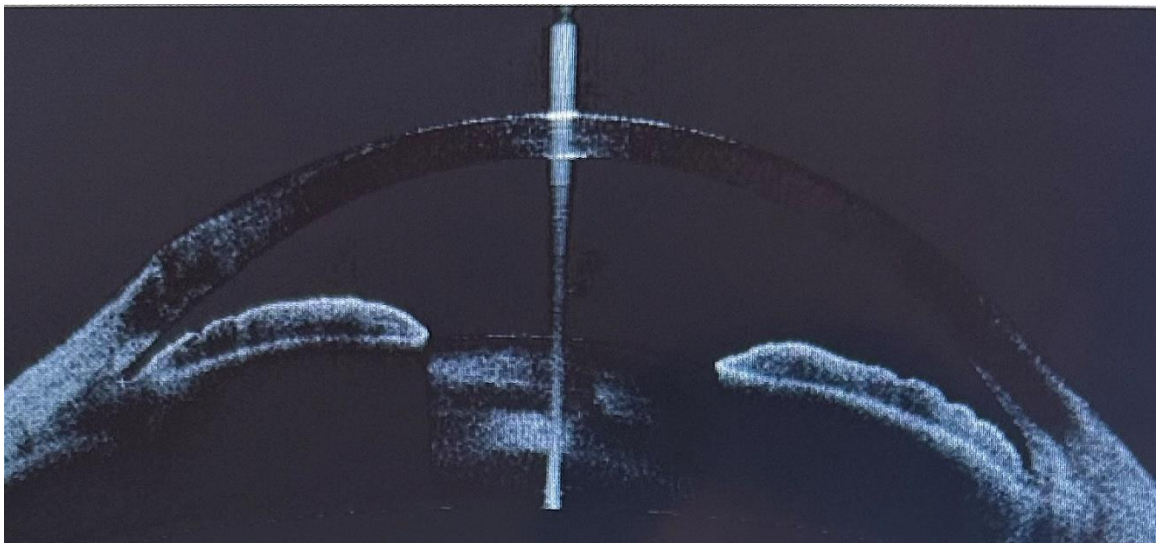
The demographic data and the patients' baseline clinical features are shown in Table 1.

Variable	Value (n=20)
Mean Age (years)	58.4 ± 8.7
Gender (M/F)	8/12
Mean IOP at Presentation (mmHg)	42.3 ± 8.2
Mean Central Anterior Chamber Depth (mm)	1.8 ± 0.2
Symptoms at Presentation	Acute Pain (70%), Blurred Vision (90%), Halos (55%)

Gonioscopy and AS-OCT Findings

Finding	Number of Patients (%)
Peripheral Anterior Synechiae (PAS)	14 (70%)
Iridotrabecular Contact	20 (100%)
Lens Position	Anterior (80%), Normal (20%)

Table 2 details the gonioscopy and AS-OCT findings.



Treatment Modalities

All patients underwent initial medical management with hyperosmotic agents, pilocarpine, beta-blockers, and carbonic anhydrase inhibitors. Subsequent interventions included laser peripheral iridotomy (LPI) and finally surgical options. Due to an increase in progression, glaucoma surgery was more common in PACG eyes compared to APAC eyes that have a history of Acute Primary Angle Closure.

The treatment modalities followed in the subjects of this study are listed below in Table 3.

Treatment	Number of Patients (%)
Medical Management Alone	4 (20%)
LPI	16 (80%)
Lens Extraction	5 (25%)
Trabeculectomy	3 (15%)

Outcomes

Outcome	Number of Patients (%)
IOP Control (≤ 21 mmHg)	18 (90%)
Visual Acuity Improvement	12 (60%)
No Further Intervention Required	16 (80%)

Table 4 presents the treatment outcomes after A 12-month follow-up period.

5. DISCUSSION

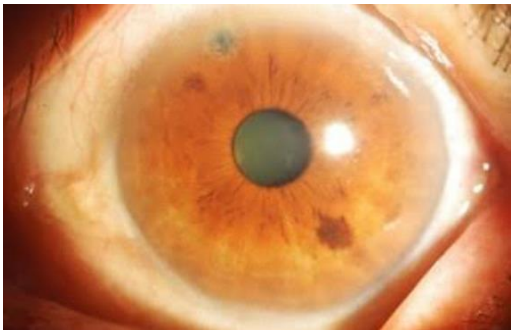
The results of this study underscore the high prevalence of ACG in Indian patients with SAC. The mean age of 58.4 years aligns with existing literature indicating higher prevalence in middle-aged and elderly populations [2]. The female predominance (60%) observed is consistent with previous studies suggesting that women are at greater risk due to anatomical differences [3].

The high incidence of peripheral anterior synechiae (70%) and complete iridotrabecular contact (100%) highlights the severity of the condition at presentation. Early detection and management are critical to prevent irreversible optic nerve damage.

Laser peripheral iridotomy (LPI) was the primary intervention, demonstrating significant efficacy in reducing IOP and preventing further attacks. LPI has a good safety profile. LPI not only affects IOP, but is also believed to prevent disease progression.

A subgroup of patients, however, needed supplementary surgical procedures, including lens extraction or trabeculectomy, in order to attain the best possible IOP control. In PACG eyes with a history of glaucoma, glaucoma surgery was more common. Acute Primary Angle Closure. Such subjects had a higher progression rate from APAC to PACG, and usually had preceding symptoms for about 3 days before presentation. Factors related with glaucoma progression include the degree of angle closure, the duration of elevated IOP, and a family history of the ailment. At presentation, a greater degree of synechial angle closure and a higher C:D ratio were factors related to the necessity for surgery in PACG eyes.

In every PAC stage, LPI reduces IOP in subjects without pre-existing disc damage, but additional treatment may be required in eyes with APAC. and such patients' progress should be tracked. to glaucoma and IOP elevation after LPI.



6. CONCLUSION

This case series highlights the clinical features and outcomes of treatment for Indian patients with shallow angle closure and anterior chamber glaucoma. Early detection, adequate intervention with frequent follow ups are essential to effectively manage this high-risk group. More such research is required to enhance long-term results and improve treatment techniques.

7. STUDY ADVANTAGES

1.Helps document variations in clinical presentation and response to treatment.

2. Provides in depth insight into angle closure glaucoma in patients with a shallow AC.

3. Useful for identifying patterns that can aid future research, like clinical trials or cohort studies.

8. STUDY LIMITATIONS

1. This study does not include Factors associated with and predisposing to sustained angle closure following laser peripheral iridotomy, including a larger mean lens vault, a thinner iris, and an anteriorly positioned ciliary body.
2. Cannot establish cause and effect relationship
3. Selection bias-no control group, and small sample size leading to limited generalizability.
4. Confounding variables- lack of adjustment for external factors that may affect the outcome

REFERENCES

[1] Foster PJ, Johnson GJ. Glaucoma in China: how big is the problem? Br J Ophthalmol. 2001;85(11):1277-1282.

[2] Quigley HA, Broman AT. The number of people with glaucoma worldwide in 2010 and 2020. Br J Ophthalmol. 2006;90(3):262-267.

[3] Lavanya R, Wong TY, Friedman DS, et al. Determinants of angle closure in older Singaporeans. Arch Ophthalmol. 2008;126(5):686-691.

[4] Radhakrishnan S, Chen PP, Junk AK, et al. Elevated intraocular pressure and other risk factors for glaucoma: identification of potentially modifiable risk factors. SurvOphthalmol. 2020;65(5):604-616.

[5] Nongpiur ME, He M, Amerasinghe N, et al. Lens vault, thickness, and position in Chinese subjects with angle closure. Ophthalmology. 2011;118(3):474-479.

[6] Friedman DS, Gazzard G, Foster PJ, et al. Ultrasonographic biomicroscopy, Scheimpflug photography, and anterior chamber depth measurement before and after laser iridotomy. Am J Ophthalmol. 2003;136(2):225-231.

[7] Tham YC, Li X, Wong TY, et al. Global prevalence of glaucoma and projections of glaucoma burden through 2040: a systematic review and meta-analysis. Ophthalmology. 2014;121(11):2081-2090.

[8] Ang LP, Aung T, ChuaWH, et al. Visual field loss from primary angle-closure glaucoma: a comparative study of symptomatic and asymptomatic disease. Ophthalmology. 2004;111(9):1636-1640.