RESEARCH ARTICLE

Effects of Laser Peripheral Iridotomy in Primary Angle Closure Suspect in asymptomatic patients (PACS) and complications of Laser Peripheral Iridotmy.

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Abstract:

Objective: The Effect of laser peripheral iridotomy(LPI) in Primary Angle Closure suspect(PACS) in asymptomatic patients and complications of laser peripheral iridotomy.

A retrospective and single institutional study.

This study's aims to evaluate the effectiveness of Laser peripheral iridotomy(LPI) in eyes with asymptomatic primary angle closure suspect (PACS) patients. We plan to conduct a retrospective chart review of patients who underwent an LPI , procedure by one glaucoma sub-specialist at Malabar Medical College and Hospital(MMC &H) between January 2017 and December2018. Patients were treated with argon green laser and Nd: Yag laser applications over iris at 7 & 4 clock in one session. Data obtained will include patients' demographics, sub-type of glaucoma, baseline IOP, Visual Fields, OCT RFNL, number of anti-glaucoma medications, and post- laser IOP at 1 hour. LPI outcomes at 4, 12 and 24weeks post laser will be evaluated by slit lamp examination and four mirror gonioscopy to know the patency of iridotomy. Statistical analyses will be performed comparing patency of iridotomy. Data on presence and degree of transient IOP rise 1-hour post procedure , complication of iridotomy will also be obtained.

Design and setting: A retrospective study, A single institutional study.

Materials and Methods: In this retrospective study, 67 adult cases of 134 eyes of Primary angle closure suspect(PACS) asypmtomatic patients were underwent 4-mirror zeiss gonioscopy before LPI procedure and slit lamp by Van Hericks ,OCT RFNL,HFA 24-2 Sita Standard ,stereioscopic fundus pictures enrolled into the study from out-patients Department of ophthalmology MMC &H, Calicut for studies between January 2017 and December 2018.

Inclusion criteria; All patients who underwent LPI treatment during above mentioned period were included.

Exclusion criteria: Eyes with corneal scar, very shallow anterior chamber , neovascular glaucoma , Iridocorneal Endothelial syndrome(ICE) ,previous ALT/ SLT patients, unco-operative patients and Uveitis patients.

Main outcome and Measure: To measure the patency of iridotomy at 4, 12 and 24weeks of post LPI treatment, to know the effects on angle of PACS patients. Statistical analyses will be performed comparing baseline gonioscopy with post-laser gonioscopy at4,12 and 24 weeks. Successful outcome will be defined as two or more ITC angles are open after LPI with no need for further medication or laser.

Results: A total of 134 eyes in 67 patients participated in this study. All 134 glaucoma eyes were treated with LPI. The 134 eyes with Successful opening of angle more than 2 for at least 24 weeks. Follow-up ranged from 4 to 24 weeks. Gonioscopy was performed in each visit to confirm the angle status and patency of iridotomy.Success is defined as opening ofmore than 2 angles ITC for at least 24 weeks, with no need for further medication or laser treatment.
The percentage of open angle at 4 weeks was more 2 angles in 36eyes(26.9%), ITC>3 angles in 28eyes, (20.9%) and ITC>4 angles in 70eyes are (52.2%) ,at 12weeks more 2 angles24eyes (17.9%), ITC> 3angles in ,30 eys(20.9%) ITC>4 angles in 80 eyes(59.7%) and 24 weeks was more 2 angles14 eyes(10.4%), ITC> 3,30eyes (22.4%) ITC>4 angle in90 eyes (67.2%) . The success rate at 24 weeks ITC more than2 angle was 10.4% , ITC>3angles 22.4% and ITC> 4angles in 67.2% respectively.In all cases, IOP was measured within 1 hour and IOP elevation of greater than 8 mm Hg was observed in eyes21 (15.7%) . Mild-to-moderate anterior chamber reaction is seen in 64eyes ,hyphema in 6 eyes, ghost images seen in 2 eyes,2 cases of macular edema, cataract progression seen in 16eyes,and closureof iridotomy in 26eyes were noted.
Post laser procedure combination of steroid and antibiotic medication was prescribed for 5 days and IOP pressure more 8 mmHg seen in 21 eyes(15.7%) ,antiglaucoma medications started and oral T. Diamox 250mg 2 tablets wre prescribed followed up after 5 days to reasess the IOP.
Conclusions: LPI is an effective treatment option for all patients with in Primary Angle Closure suspect to prevent the acute angle closure glaucoma.LPI is a effective, compliance-free, repeatable,most PACS eyes don't receive further treatment and safe therapeutic modality having only minor, transient, self-limiting or easily controlled side effects with no sequelae. Progression to PACG is uncommon in PACS and PAC. Despite our methodology, the inherent limitations of studies should be considered, and conclusion drawn from our pooled results should be interpreted with caution. Future large-volume, well-designed with extensive follow-up are awaited to confirm and update the findings of this analysis.

Keywords: Abraham lens,Laser peripheral Iridotmy, primary angle closure suspect glaucoma, intraocular pressure, iridotrabecular angle.

Introduction

Literature Review

Background

Friedrich Wilhelm Ernst Albert von Grafe prussian poineer German ophthalmologist introduced iridectomy for glaucoma in 1857. 111 million people around the world predicted to have glaucoma by 2040.[1] Angle closure glaucoma is an aggressive condition that causes millions to become blind world wide.This article explores the use of prophylactic laser peripheral iridotomy (LPI)in patients primary angle-closure suspect. Angle closure glaucoma is defined by the presence of iridotrabecular contact(ITC), either by appositional or synecheial.

Glaucoma is a disease in which the optic nerve is damaged, leading to progressive and irreversible loss of vision. Glaucoma can develop at any intraocular pressure is one of the major risk factors for the development and progression of glaucoma. .

Ethinic background is one of the major factors determining susceptibility to primary angle- closure (PAC).Among aged 40 years and overs , the prevalence of PAC ranges from 0.1% in Europeans, through 1.4% in East Asians, upto 5% in Greenland Inuit. [2] In vellore , southern India , the prevalence of PACG, was 4.3% among aged 30 to 60 years. [3] All the PACG cases detected were of the chronic type, making PACG about 5 times as common as POAG. Glaucoma is a disease in which the optic nerve is damaged , leading to progressive and irreversible loss of vision. Glaucoma can develop at any intraocular pressure, but elevated intraocular pressure(IOP) is one of the major risk factors for the development and progression of glaucoma.

Laser peripheral iridotomy (LPI) is the procedure of choice for angle closure glaucoma caused by relative or absolute pupillaryblock.LPI eliminates pupillary block by allowing the aqueous to pass directly from the posterior chamber to anterior chamber , bypassing the pupil.LPI can be performed with an argon laser, with a neodymiun:yttrium- aluminum – garnet(Nd:yag) laser or with both [4]

Intraocular pressure (IOP) remains the only modifiable risk factor for glaucoma and its reduction has shown to delay the onset and progression of the disease. One such means is through laser peripheral iridotomy (LPI), which describes the use of laser on iris to promote aqueous outflow that in turn lowers the IOP. [5] A type of laser Laser Peripheral Iridotomy(LPI) has been considered a safe and effective modality for reducing (intraocular pressure) IOP in patients with Primary angle closure suspect (PACS) or Primary Angle closure (PAC).

Indications:

Indication for LPI includethe following-
Acute angle closue glaucoma.
Fellow eye with angle closure suspect.
Narrow angle and occludable angle.
Other conditions like-pigmentary glaucoma, phacomorphic glaucoma, plateau iris sysndrome.

Contraindications: for LPI includes conditions that cause poor visualisation of angledue to snechieal closure of the angle chamber and iris.
Corneal edema. Corneal opacity.Shallow anterior chamberNeovascular glaucoma Irido corneal endothelial synrome (ICE)
Classification of Angle ClosureGlaucoma . [6]

PAC becomes more likely as the separation between the iris and TM decreases.The risk of iridotrabecular contact in a narrow angle begins to increase once the iridotrabecular angle is less than 20degree.With angle of 20 degree or less signs of previous closure, such as PAS os iris pigment on the TM,

should be carefully sought signs of previous closure. [4]

1)Primary Angle closure Suspect(PACS)

Two or more quadrants of irido trabecular contact(ITC),normal IOP, no PAS, no evidence of glaucomatous optic neurophathy(GON).

2)Primary Angle closure (PAC)

Iridotrabecular contact(ITC) resulting in PAS and / or raised IOP.No evidence of glaucomatous optic neurophathy(GON).

3)Primary Angle closureGlaucoma (PACG)

Iridotrabecular contact(ITC) causing GON: PAS and raised IOP may be absent at the time of initial examination.

LPI has been FDA approved and has a proven track record for efficacy. The LPI eliminates the pupillary block and prevents the acute attack. The treatment effect may last for life time and the laser can be repeated when the LPI closed by pigmentation. It has a good safety profile and has almost no permanent side effects . The biggest advantage of LPI is that it is repeatable.

The Shaffer system is based on angularity . It also uses a number system, but is in reverse of the Scheie system. For example, a Grade 4 angle in the Shaffer system is wide open, while a Grade IV in the Scheie system is anatomically closed with no structures visible. [6]

Table-1 Shaffer classification

Angular Grade	**Width (in degrees)**	**Grade**	**Clinical Interpretation**
Wide Open Angle	45-35	4	Angle closure impossible in both Grades 3 and 4
	35-20	3	
Narrow Angle	20	2	Angle closure possible
Narrow Angle, extreme	10 or less	1	Angle closure probable, eventually
Narrow Angle, slit	Critically narrowed angle, quite possibly against the trabecular meshwork beyond Schwalbe's line	-	-
Narrow angle, partial or complete closure	0	0	Angle closed in part or all of circumference

Van Herick system.

Van-Herick is a non-gonioscopic grading system. It uses an estimation of the peripheral anterior chamber depth.It is done at the slit lamp and is most helpful before dilation. A thin slit beam is aligned on temporal limbus approximately 60 degrees and aimed at the cornea peripherally near the temporal limbus. The corneal thickness is compared to the anterior chamber depth. The ratio is then used to provide some information on the width of the anterior chamber angle. It is done without gonioscopy, no angle structures can be identified and it does not replace gonioscopy.

Table 2-Van Herick Classification system.

Grade Cornea:	**Peripheral anterior chamber ratio**	**Risk of angle closure Angle (°)**
4	1:1 or higher	Very unlikely or impossible 35-40
3	1:1/2	Unlikely or improbable 20-35
2	1:1/4	Possible 20
1	1:<1/4	Likely or probably 10
0	No anterior chamber slit visible	Closed 0

The work behind LPI was pioneered by von Graefe . We used two laser for LPI,Argon green laser and Q-switched, frequency-doubled neodymium:Ytrium–aluminum–garnet (Nd:YAG) laser. We used same laser settings in patients with blue or green/light brown irides.

Argon green laser is employed to remove the iris stroma and thinning, results in lower energy needed with the Nd:Yag laser, which is then used to penetrate the iris and create an iridotomy.Argon laser carries a lower risk of complications namely hyphema.

The iridotomy site should be in the peripheral third of the iris just anterior to the arcus. A crypt or a thinned area of the iris is recommended. Most ophthalmologists place the iridotomy between 11 o'clock and 1 o'clock, where it is superiorly covered by

the lids. The author, however, prefers using the 4-o'clock or 7-o'clock position. With a nasal or temporal iridotomy site, the view is not limited by the arcus; also, optical aberrations are less frequent than they would be with a superior site.Fleck has recommended that the iridotomy be at least 200 μm in size. [7] Lam et al prefer that it be 500 μm in diameter. [8]

Application of laser

Different laser settings are employed, depending on the device used, the clinical situation, and the color of iris.

We used same laser settings in patients with blue or green/light brown irides. [8]

Argon green laser is employed to remove the iris stroma and thinning, results in lower energy needed with the Nd:Yag laser, which is then used to penetrate the iris and create an iridotomy.Argon laser carries a lower risk of complications namely hyphema. [9]

Using the following argon laser settings:

- Power - 750 mW
- Spot size - 50 mm
- Duration - 0.03-0.04 seconds

Neodymium:yttrium-aluminum-garnet (Nd:YAG) laser, using the following settings:

- Power - 4-8 mJ
- Pulses/burst - 1-3
- Spot size - Fixed

If an air bubble develops, the power is reduced. The bubble can be easily dislodged by aiming the next laser shot at the inferior margin of the bubble. Aiming at the center of the bubble is not recommended, because the laser energy may be reflected back toward the cornea and causes a corneal burn. [10]

The goal is to visualize aqueous following through the iridotomy site with iris pigment release. Additionally, the anterior capsule should be visible. If iris bleeding develops, pressure is applied to the globe with the contact lens (for approximately 10-20 seconds) until the bleeding is stopped.

End point-A small size 150-200micron,peripheral and completely patent, when pigment, mixed with aqueous, flows from posterior into the anterior chamber. [8] After fullthickness hole has been made, should be enlarged horizontally to achieve an adquate size. Transillumination through the iridotomy is not a reliable indicator of patency.

LPI is essentially a very safe laser treatment with only a few transient side effects that include anterior chamber reaction. [5] , IOP spikes during the first few hours, eye pain, corneal edema or coneal decompensation and blurred vision. Rarer complications can include corneal haze,diplopia, ghost images, scarring, choroidal effusion and macular oedema. [5]

However, LPI is uniformly effective for all with PACSpatients. Based on our understanding of the laser LPI compare to incisional technology, we are aware that variations in race and iris (dark vs blue) pigmentation can potentially influence laser success. [5] The main purpose of our study is to determine the effect of LPI onasymptomatic PACS glaucoma eyes.

Type & Design of study: Retrospective study.

Department of Malabar Medical College and Hospital, Atholi , Calicut, Kerala for studies between January 2017 and December 2018.

Inclusion criteria: All patients who underwent LPI treatment during above mentioned period were included.

Exclusion criteria: Eyes with corneal scar, very shallow anterior chamber , neovascular glaucoma , Iridocorneal Endothelial

syndrome (ICE), uncooperative patients and Uveitis patients.

Study Design and plan: This is a retrospective study planned to be conducted by the Department of Ophthalmology through reviewing charts of those who underwent an LPI procedure at Malabar Medical College and Hospital, between January 2017 and Dcember 2018. Patients were identified from computerized coding for glaucoma and LPI performed during the above period were reviewed. These patients were managed by the same glaucoma sub-specialist and study investigator (AB) at Malabar Medical College and Hospital. All patients were provided with written consent prior to undergoing laser treatment after risks, benefits, complications and alternatives were fully discussed with the patient .

Patient Preparation for Laser.

Writtern consent has taken prior to laser procedure and ethical committie approval has been taken before strarting study.

Risks and benefits in detail disussed with patients.
Topical anaesthesia with proparacaine 0.5%(Paracaine) is applied before performing LPI.
Application of 1%pilocarpine eye drops, one drops twice in15 mintues apart to constrict the pupil ,to reduce iris thickness , stretch the peripheral iris and making it thinner , eaiesr to penetrate. [11] Higher concentrations of pilocarpine are not recommended, because they can cause paradoxical angle closure glaucoma.[11]
Postlaser IOP spike is a common complication of LPI, the eye should be pretreated with topical pilocarpine 1%, and either apraclonidine (0.5% or 1%) or brimonidine (0.1%, 0.15%, or 0.2%); the use of apraclonidine or brimonidine significantly reduces the risk of post laser IOP spikes. [12, 13]

Equipment
We used two laser machines first an argon Green laser followed by neodymium:yttrium-aluminum-garnet (Nd:YAG) laser and used lens an Abraham .The Abraham lens consists of glass plate has a +66 diopter planoconvex button bonded into a decentered 8-mm hole. [9]
Technique
LPI was performed with the combination of Argon green laser and neodymium:yttrium-aluminum-garnet (Nd:YAG) laser .
Placement of contact lens on eye
Identification of iridotomy site
The iridotomy site should be in the peripheral third of the iris just anterior to the arcus. A crypt or a thinned area of the iris is recommended. Most ophthalmologists place the iridotomy between 11 o'clock and 1 o'clock, where it is superiorly covered by the lids. The author, however, prefers using the 4-o'clock or 7-o'clock position. With a nasal or temporal iridotomy site, the view is not limited by the arcus; also, optical aberrations are less frequent than they would be with a superior site.Fleck has recommended that the iridotomy be at least 200 μm in size [7] . Lam et al prefer that it be 500 μm in diameter. [8]

Application of laser
Different laser settings are employed, depending on the device used, the clinical situation, and the color of iris.
We used same laser settings in patients with blue or green/light brown irides[14] .
Argon green laser is employed to remove the iris stroma and thinning, results in lower energy needed with the Nd:Yag laser, which is then used to penetrate the iris and create an iridotomy. Argon laser carries a lower risk of complications namely hyphema.

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Monitoring and Follow-up

At 1 hour after completion of LPI, the intraocular pressure (IOP) should be checked to make sure that it did not increase significantly (ie, that IOP has not increased by 8 mm Hg or more and that IOP does not exceed 30 mm Hg). [5]

Topical prednisolone acetate 1% and antibiotic is given 4 times a day for 5-7 days. At 4 weeks, the patient is seen to monitor IOP, to confirm the patency of the iridotomy site by gonioscopy and to check for any significant intraocular inflammation.Repeated laser was performed when the initial LPI was found to be non-patent after gonioscopy and anterior segment OCT.

At 12 and 24 weeks , the patient is seen again for a complete examination that includes IOP measurement, slit-lamp examination, gonioscopy, and dilated fundus examination. IOP is also measured after dilation. If IOP rises by more than 8 mm Hg, the anterior chamber angle is still occludable, and the patient must be evaluated for other causes of angle closure (eg, plateau iris) .

Patients received a argon green laser and Nd:Yag laser during one session as a standard treatment protocol. All LPI procedures were performed by the same glaucoma sub-specialist (AB) using a argon green laser and Q-switched Nd:YAG laser , topical anesthesia and a Abhram Lens .Eyes that were excluded were those who did not complete the LPI treatment or those with corneal disease that inhibited good visualization of the iris.

Data will be extracted from the medical records at baseline visit (pretreatment) and at follow up visit at 24 weeks post treatment. At baseline, the following data are to be obtained from patient records: age, gender, glaucoma subtype, previous glaucoma treatments, baseline IOP, baseline glaucoma severity (i.e mean deviation (MD) and pattern standard deviation (PSD) on visual field), baseline best corrected visual acuity (BCVA). At 24 weeks follow up, the following data are to be extracted from patient records: current anterior chamber depth and patentof LPI by gonioscopy. Gonioscopy examination revealed that angle deepening had no effect on the need for IOP-lowering medications.

Incidence and severity of IOP spikes at 1hour post LPI will be calculated and recorded. All IOP measurements recorded were performed using the standard Goldmann applanation tonometry (GAT).

Statistical analysis will be performed using appropriate tests to analyze the date. Several outcome measures will be looked at24 weeks :opening of angle, success rate, complicatons and degree of transient IOP rise at 1-hour post procedure.

Statistical Analysis:

Data were analyzed using IBM SPSS statistics 22.0 (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version

22.0. Armonk, NY: IBM Corp.) Categorical variables were presented with frequency and percentage, continuous variables presented with mean and standard deviation.

Results:

Clinical results with LPI in our retrospective study of 134 eyes(67 patients) of asymptomatic primary angle closure suspect glaucoma (PACS) . Of the studied 134 eyes the mean age of the patient in the population was 62 years.(Table1) Out of 134 eyes, 52eyes had ITC opening of 2angles,40 eyes ITC more than3 angles closure and 42eyes of more than 4 angle closure in this study. (Table1) The laser peripheral iridotomy were treated in one session by two ophthalmologist (AB).
All patients were not on any antiglaucoma medications, VF 24-2, OCT RFNL are normal . IOP range from 16 mmHg to 19 mmHg before treatment.

Follow-up ranged from 4 to 24 weeks. Repeated laser was performed when the initial LPI was found to be non- patent after gonioscopy and anterior segment OCT. The percentage of open angle at 4 weeks was more 2 angles in 36eyes(26.9%), ITC>3 angles in 28eyes, (20.9%) and ITC>4 angles in 70eyes are (52.2%) ,at 12weeks more 2 angles24eyes (17.9%), ITC> 3angles in ,30 eys(20.9%) ITC>4 angles in 80 eyes(59.7%) and 24 weeks was more 2 angles14 eyes(10.4%), ITC> 3,30eyes (22.4%) ITC>4 angle in90 eyes (67.2%) .(Table5).

The success rate at 24 weeks ITC more than2 angle was 10.4% , ITC>3angles 22.4% and ITC> 4angles in 67.2% respectively. (Table5 and Bar chart 6,7,8)).

In all cases, IOP was measured within 1 hour and IOP elevation of greater than 8 mm Hg was observed in 21 eyes (15.7%)(Table and Bar chart 3,4) , Mild-to-moderate anterior chamber reaction was observed in 61 eyes (45.5%) and hyphema in 6 (4.5%)eyes . Other complications like CME in 2(1.5%) eyes, closure of LPI in 26(19.4%) eyes, Ghost images in 2(1,5%) eyes and cataract progression is seen in 16 (11.9)eyes.(Table 9 and Bar chart 10).

Post laser procedure antibiotic and steroid combination topical drops four times per day for 5days medication was prescribed and started antiglaucoma medications for those who were IOP more 8 mmHg. Patients with high IOP followed up after 5 days to recheck the IOP.

Table 1: Characteristics of the patients.

Variables	**Age**	**number**	**%**
Gender Male	40-70 years	24	35.8%
Female	40- 65 years	43	64.1%
Gonioscopy- by 4 mirrorPre – Laser before LPI		Number of eyes	%
ITC=2angles		52	38.8%
ITC>more than 3angles		40	29.85
ITC all 4angles closure		42	31.3%

Table 2:Bar chart showing characteristics of the patients.

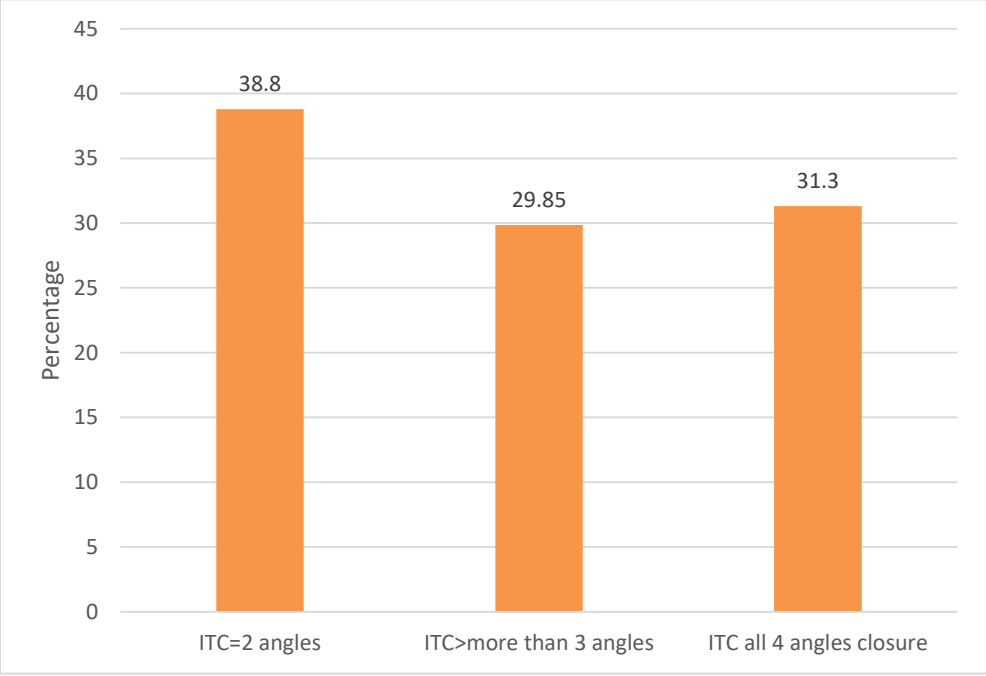


Table 3: Measurement of IOP post 1 hour , using paired t test.

IOP measurement	**Number of eyes. 134 Eyes.**	**p-Value***
Less than <8 mmHg	113	84.3%
More than > 8 mmHg	21	15.7%

Table 4: Bar chart showing measurement of IOP post 1 hour , using paired t test.

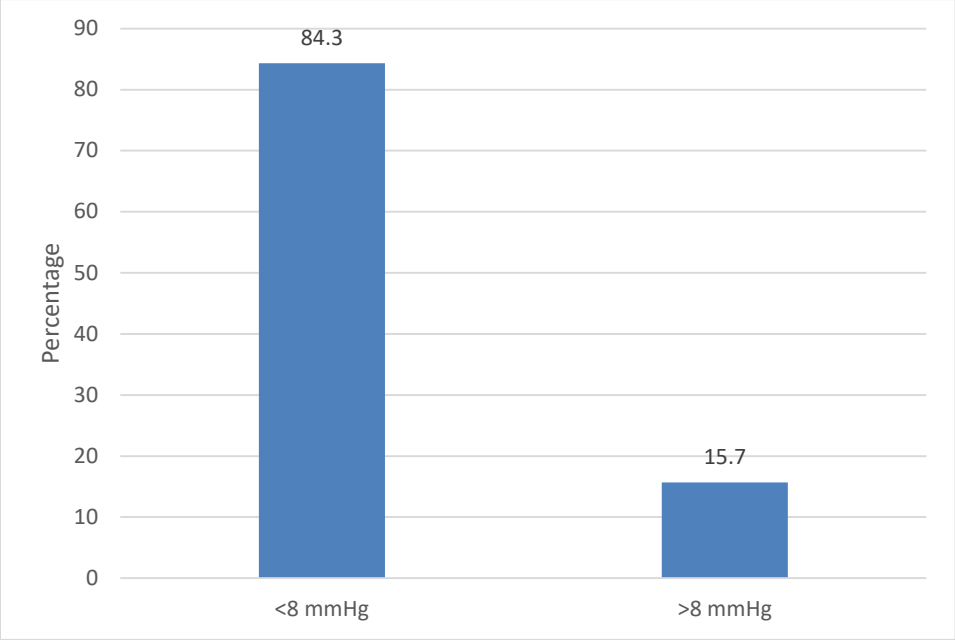


Table 5: Comparison of post 4,12 and 24 weeks, gonioscopy measurement after LPI.

Angle measurement by goinioscopy	**4 weeks**		**12 weeks**		**24 weeks**	
Eyes	134	%	134	%	134	%
ITC,>2angles	36	26.9%	24	17.9%	14	10.4%
ITC>3angles open	28	20.9%	30	22.4%	30	22.4%
ITC>4angles open	70	52.2%	80	59.7%	90	67.2%

Table 6:Bar chart showing Comparison of post 4 weeks, gonioscopy measurement after LPI.

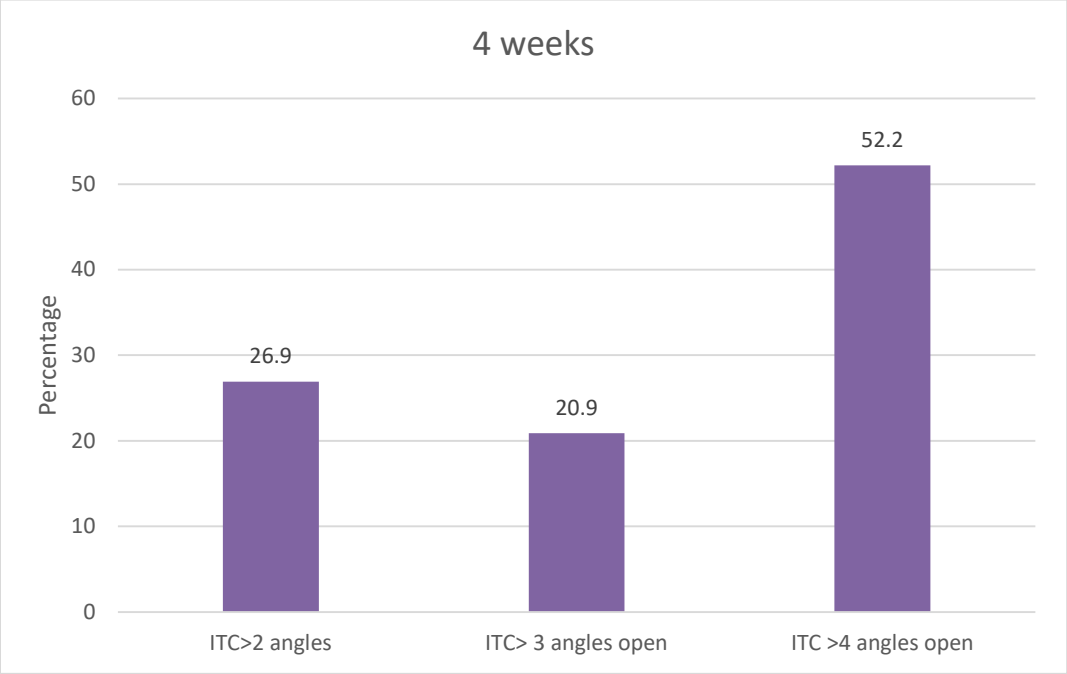


Table 7:Bar chart showing Comparison of post 12 weeks, gonioscopy measurement after LPI.

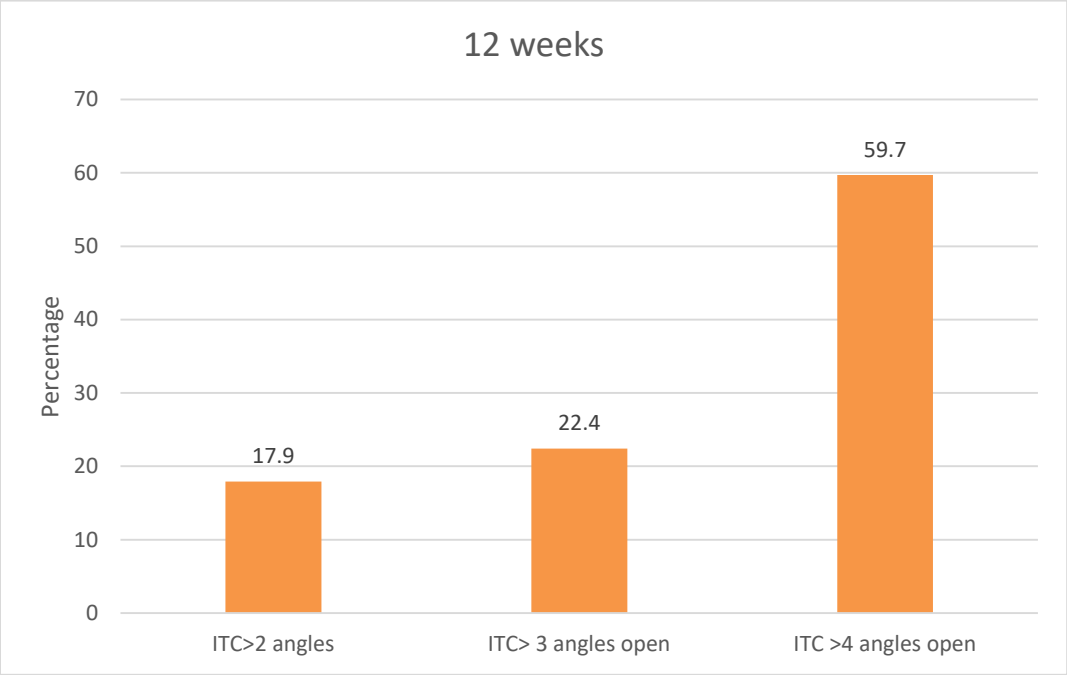


Table 8:Bar chart showing Comparison of post 24 weeks, gonioscopy measurement after LPI.

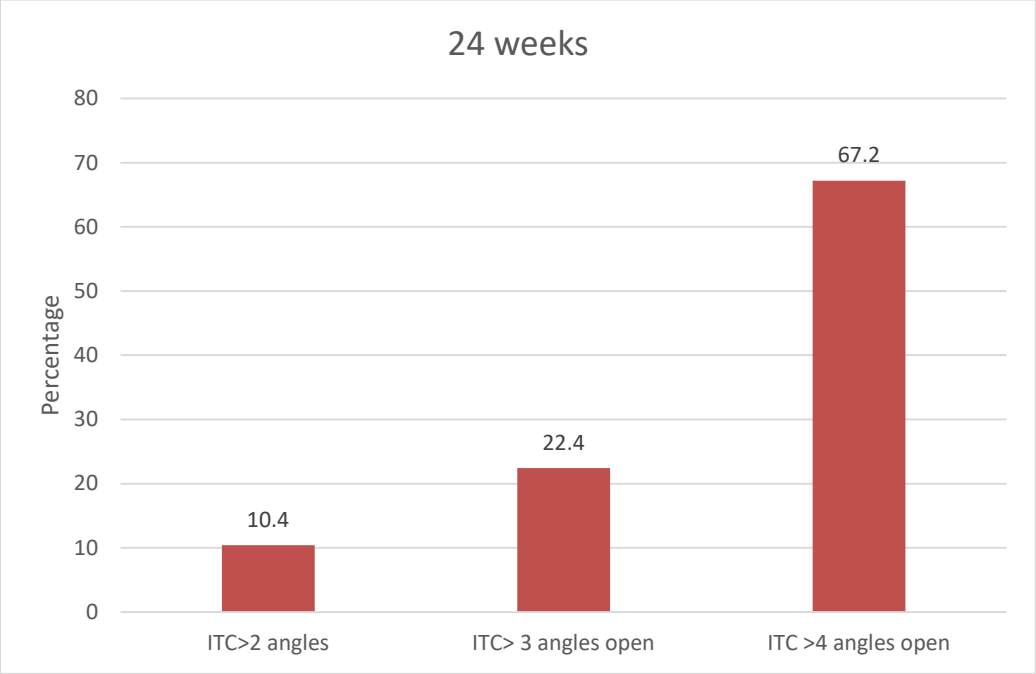
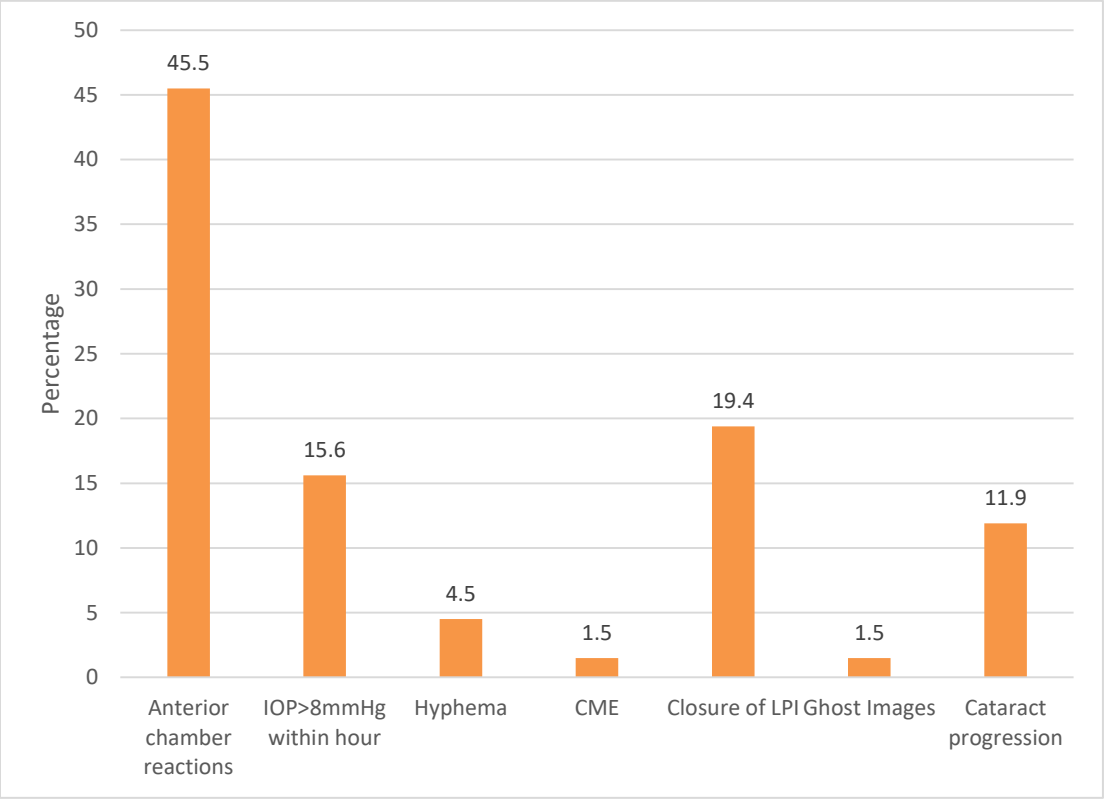


Table 9: Complications of peripheral Laser iridotomy using paired t test.

Complications	Number eyes134	Percentage (%)
Anterior chamber reactions	64	45.5%
IOP->8mmHg within hour	21	15.6%
Hyphema	6	4.5%
CME	2	1.5%
Closure of LPI	26	19.4%
Ghost images	2	1.5%
Cataract progression	16	11.9%

Table 10: Bar chart showing complications of peripheral Laser iridotomy using paired t test.



Discussion:

Primary angle closure glaucoma affects 20 million people worldwide. People classified as PACS have a higher but poorly quantified risk of developing glaucoma. We aimed to assess efficacy and safety of laser peripheral iridotomy prophylaxis against PACS.

Lpi has been available since 1970s,its role in the treatment for PACS is still under debate: questions such as who should be treated with an iridotomy and whether iridotomy prevents disease progression continue to be relevant today. [15] LPI is generally a safe procedure with good efficacy in the the prevention of pupil block. Laser iridotomy is performed primarily for the treatment of acute angle-closure glaucoma (AACG) or PACS caused by relative papillary block. Laser iridotomy offers the same efficacy as surgical iridectomy with fewer complications and can be easily and quickly performed in outpatient departments. [16] Success rates of laser iridotomy have been reported to be from 65-76%, [17]and are relatively low in patients of east Asian descent[18]. The success rate of laser iridotomy is influenced by the length of follow-up period. [19]

The most common procedure for angle closure is YAG LPI, but of late controversy surrounds the ability to diagnose cases which actually require iridotomy. The lack of precise tests which prognosticate the need for an iridotomy has resulted in clinical examination being used to decide whether an eye has to undergo an iridotomy. Since not all primary angle closure suspects (PACS) will progress to primary angle closure (PAC) or to PACG, one must be

judicious in advising an iridotomy. Among PACS, only those with high risk should be considered for LPI. LPI had a modest, albeit significant, prophylactic effect. In view of the low incidence rate of outcomes that have no immediate threat to vision, the benefit of prophylactic laser peripheral iridotomy is limited; therefore, widespread prophylactic laser peripheral iridotomy for primary angle-closure suspects is not recommended.

The Indian and East Asian population has a high incidence and prevalence of primary angle closure glaucoma (PACG) which also has a greater blinding potential when compared to open angle glaucoma.

This study differs from other studies in that the study population included only eyes with good visual acuity, IOP in normal limits , not on any anti- glaucoma medications, normal VF and OCT RFNL and study does not include eyes with a history of previous acute angle closure attacks. Because both eyes of a patient were included in this study, this may have biased the estimation of standard deviations of outcome variables, as there was a correlation between eyes.

Also, only 2 ophthalmologists were involved in the care and treatment of the patients, making generalizability of the results limited. Nevertheless, this study is unique in that it is the first study to provide information regarding clinical outcomes after initial PI in the entire PACS spectrum of patients.

Conclusions:

Laser peripheral iridotomy increases angle width in all stages of primary angle closure suspect(PACS) and has a good safety profile.LPI is an effective treatment option for in patients with in Primary Angle Closure suspect to prevent the acute angle closure glaucoma.LPI is a effective, compliance-free, repeatable, most PACS eyes don't receive further treatment and safe therapeutic modality having only minor, transient, self-limiting or easily controlled side effects with no squeale. Progression to PACG is uncommon in PACS and PAC. Despite our methodology, the inherent limitations of studies should be considered, and conclusion drawn from our pooled results should be interpreted with caution. Future large-volume, well-designed with extensive follow-up are awaited to confirm and update the findings of this analysis

Conflict of Interests

The authors of the paper do not have a direct financial relationship with the commercial entities mentioned in the paper that might lead to a conflict of interests.

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