



The outcome of YAG laser PI (peripheral iridotomy) in management of glaucoma patients in Bangladesh

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Abstract

Objective: In this study our main goal is to evaluate the outcome of YAG laser PI (peripheral iridotomy) in management of glaucoma patients in Bangladesh.

Method: This cross-sectional study was done in the in the National Institute of Ophthalmology & Hospital from September 2013 to September 2016. A total of 120 consecutive patients were included. On the basis of Academy of Ophthalmology primary Angle Closure glaucoma preferred practice pattern patients were sub divided into three group: primary angle closure suspect (PACS) (#180° iridotrabecular contact [ITC], normal IOP and no optic nerve damage), n=40: primary angle closure (PAC) (\$180° ITC with peripheral anterior synechiae [PAS] or elevated IOP, but no optic neuropathy), n=40; and primary angle closure glaucoma (PACG) (\$180° ITC with PAS, elevated IOP and optic neuropathy, n=40.

Results: during the study, 40% percent of the patients had undergone bilateral LPI. mean power used in primary angle closure glaucoma was 130±126.8.3% produced hyphema in 1st year, followed by 1% produced hyphema in 2nd year, no patients found in 3rd year. In primary angle closure suspect cases, 27% had repeated laser peripheral iridotomy, followed 11% in primary angle closure cases and 15% in primary angle closure glaucoma

Conclusion: From our study we can conclude that, laser iridotomy for the clinical treatment of early primary angle-closure glaucoma effectively reduces the intraocular pressure and improves the acuity level of patient. Early treatment by laser iridotomy may also reduce the risk rate to develop primary angle glaucoma. The effective rate of treatment is high, so the treatment improves the quality of life of patients.

Keywords: YAG laser PI (peripheral iridotomy), primary angle closure glaucoma, primary angle closure.

Introduction

Glaucoma is a group of eye conditions that damage the optic nerve, the health of which is vital for good vision. This damage is often caused by an abnormally high pressure in eye. If the

damage worsens, glaucoma can cause permanent vision loss or even total blindness within a few years.¹

YAG laser PI (peripheral iridotomy) has been widely used and accepted as a treatment for all

forms of angle closure glaucoma in which there is a component of pupillary block and is used as a prophylactic treatment for angle closure suspects.^{1,2} During ophthalmology residency training, the Accreditation Council for Graduate Medical Education (ACGME) currently recommends that all residents perform a minimum of 5 LPI procedures prior to graduation.³ Although LPIs are generally considered safe, complications are known to occur. Complications include transient blurred vision, intraocular pressure (IOP) rise, dysphotopsia, hyphema, closure of the iridotomy and damage to other tissues.^{1,2,4}

In this study our main goal is to evaluate outcome of YAG laser PI (peripheral iridotomy) in management of glaucoma patients in Bangladesh.

Objective

General Objective

- To evaluate outcome of YAG laser PI (peripheral iridotomy) in management of glaucoma patients in Bangladesh

Specific Objective

- To detect clinical characteristics of patients.
- To identify complication rates by year of the patients.

Methodology

Type of study	Cross sectional study.
Place of study	National Institute of Ophthalmology & Hospital
Study period	September 2013 to September 2016
Study population	120 consecutive patients of primary angle closure, primary angle closure suspects and glaucoma who presented to the glaucoma services.
Sampling technique	Purposive

Method

On the basis of Academy of Ophthalmology Primary Angle Closure Preferred Practice Pattern

patients were sub divided into three group: primary angle closure suspect (PACS) (#180° iridotrabecular contact [ITC], normal IOP and no optic nerve damage), n=40: primary angle closure (PAC) (\$180° ITC with peripheral anterior synechiae [PAS] or elevated IOP, but no optic neuropathy), n=40; and primary angle closure glaucoma (PACG) (\$180° ITC with PAS, elevated IOP and optic neuropathy, n=40. Patient details such as age, sex, socioeconomic status was noted. A detailed history was taken regarding the duration and type of symptoms, systemic associations and treatment taken. Initial evaluation of the patients by history and clinical examination was performed and recorded in patients’ data collection sheet.

Statistical Analysis

Data were processed and analyzed using computer-based software SPSS (Statistical Package for Social Sciences) for windows version 22. Unpaired t-test was used to compare quantitative variables. Variables were expressed as range and mean ± SD. p value < 0.05 were taken significant. Students’ t test, Pearson’s correlation coefficient test, multivariate logistic regression analysis and Fisher’s exact test as applicable.

Results

In table-1 shows age distribution of the patients where most of the patients (45.9%) belongs to age group 50-60 years. The following table is given below in detail:

Table-1: Age distribution of the patients

Variable	Distribution	Percentage (%)
Age group	40-50	31.8
	50-60	45.9
	60-70	28.9

In figure-2 shows gender distribution of the patients where male was 79% and female was 21%. Male patients were 58% higher than female. The following figure is given below in detail:

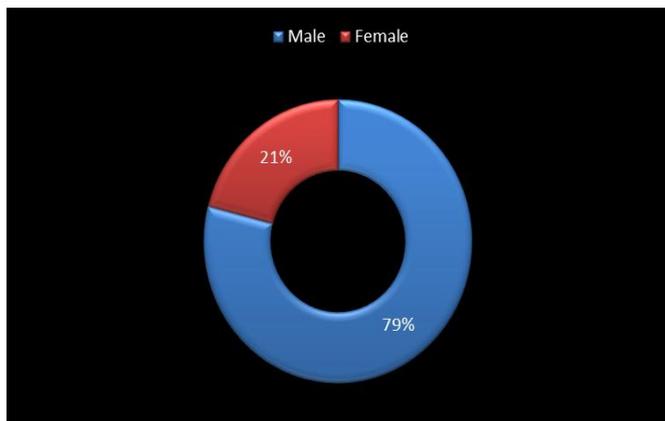


Figure-2: Gender distribution of the patients.

In table-3 shows residential area distribution of the patients where 80% patients belong to urban area the following table is given below in detail:

Table-3: Residential area distribution of the patients

Residential area	%
Urban	80%
Rural	20%

In table-3 shows clinical characteristics of the patients where 40% percent of the patients had undergone bilateral LPI. The following table is given below in detail:

Table-3: Clinical characteristics of the patients

Variable	mean±SD, %
% of eye:	
right eye	25%
left eye	35%
bilateral eye	40%
Mean baseline iOP (mmhg)	19.48±11.1
Mean post-laser iOP (mmhg)	14.30±7.8
Diagnosis	
Primary angle closure suspect,	35%
Primary angle closure	10%
Primary angle closure glaucoma	50%
Uveitic glaucoma	5%

In table-4 shows mean power use by year where mean power used in primary angle closure glaucoma was 130±126.8. The following table is given below in detail:

Table-4: Mean power use by year

Variable	1 st year	2 nd year	3 rd year
Mean power used in primary angle closure suspect	77.0±57.9	77.0±57.9	71.3±68.2
Mean power used in primary angle closure	142.5±72.5	142.5±72.5	86.9±41.1
Mean power used in primary angle closure glaucoma	86.9±41.1	135.6±86.4	130±126.8

In figure-3 shows complication rates by year where 3% produced hyphema in 1st year, followed by 1% produced hyphema in 2nd year, no patients

found in 3rd year. The following figure is given below in detail:

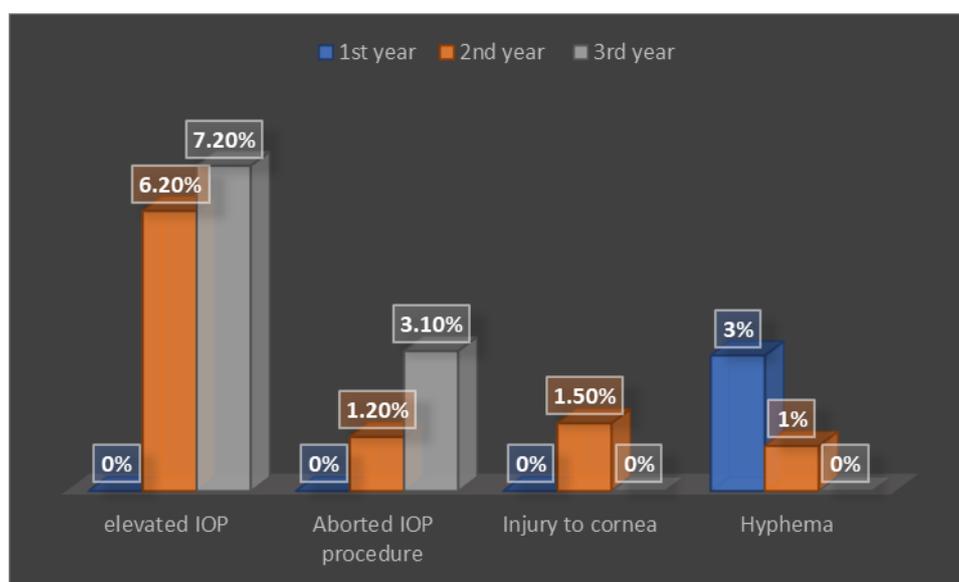


Figure-3: Complication rates by year

In table-5 shows comparison of mean power use and complication rates among different diagnoses, in primary angle closure suspect cases, 27% had repeated laser peripheral iridotomy, followed 11%

in primary angle closure cases and 15% in primary angle closure glaucoma. The following table is given below in detail:

Table-5: Comparison of mean power use and complication rates among different diagnoses.

Variable	Primary angle closure suspect, n=40	Primary angle closure, n=40	Primary angle closure glaucoma, n=40
Mean power ± sD (mJ)	70.7±62.4	90.5±65.7	107.11±89.1
elevated iOP	6.2%	6.8%	0
Failed or incomplete iOP	0.02%	0	0
Hit cornea	0.01%	0	0
Hyphema	1.4%	2%	3%
Repeat	27%	11%	15%

In figure-4 shows visual acuity of the patients were on the basis of Logmar chart, mean percentage of visual acuity where before treatment visual acuity of the primary angle closure suspect

was 80%, which was 3% increased after treatment, 83%. The following figure is given below in detail:



Figure 4: Distribution of the patients on the basis of visual acuity

Discussion

A total of 53% patients underwent repeat LPIs. All repeat procedures were performed due to occluded iridotomies. Which similar to one study.⁵

Another article reported that, an association between the total amount of energy use and risk of post-LPI IOP elevation, other studies did not report such an association.⁶ Likewise, we did not identify a correlation between post-LPI IOP elevation and energy use. The incidence of

hyphema by a year in our study was 3% produced hyphema in 1st year, followed by 1% produced hyphema in 2nd year, no patients found in 3rd year. Which is comparable to the 8.9%–34.6% reported in the literature.^{4,6-8} In our study, no subjects with hyphema had post-LPI elevation.

When the overall complication rates between the groups were analyzed, there was no significant difference between the groups. In one study reported that, inflammation, hyphema, corneal decompensation, cataract formation, IOP

elevation, retinal detachments and cystoid macular edema are more common with higher total Nd: YAG energy use in LPI procedures.^{1,2,7}

During the study, on the basis of Logmar chart, mean percentage of visual acuity before treatment in primary angle closure suspect was 80%, which was 3% increased after treatment, 83%. But in primary angle closure glaucoma before treatment it was 61%, after treatment only 2% was increased. Which was quite similar to other studies.⁶⁻⁸

Several studies over the years have shown that as IOP rises above 21 mm Hg, the percentage of patients developing visual field loss increases rapidly, most notably at pressures higher than 26-30 mm Hg. A patient with an IOP of 28 mm Hg is about 15 times more likely to develop field loss than a patient with a pressure of 22 mm Hg.⁷⁻⁸ It is recommended that the iridotomies are created using the lowest laser energy necessary to minimize complications.

Conclusion

From our study we can conclude that, from our study we can conclude that, laser iridotomy for the clinical treatment of early primary angle-closure glaucoma effectively reduces the intraocular pressure and improves the acuity level of patient. Early treatment by laser iridotomy may also reduce the risk rate to develop primary angle glaucoma. The effective rate of treatment is high, so the treatment improves the quality of life of patients.

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