Scope
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Ole of Cyclocryotherapy for Painful Blind Eye at Tertiary Care Hospital in Uttrakhand

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Abstract

Introduction:-Aim of the study was to overview the cost-effectiveness of cyclocryotherapy in patients of painful blind eye of glaucoma OPD patients. **Materials and methods:** -Twenty patients of painful blind eye from glaucoma clinic, who underwent cyclocryotherapy, were included in the study. Were corded the demographic & clinical details. Patient underwent complete ocular examination including visual acuity, intraocular pressure (IOP) , anterior segment examination on slit lamp & fundus examination (ifocular media is clear). Paired sample t-test was used to compare pre and post cyclo IOP at 3months. **Results :-** The mean age of 20 patients was 57.2± 14.5 years; male: female ratio was 0.8:1.Patient were mainly from rural areas (70%). The mean pre treatment IOP in all patients was 41.35±10.76 mmHg and 18.22±6.49 mmHg at 3 month follow-up. Thus, there was significant reduction in IOP post cyclocryotherapy ($p<0.001$). **Conclusion :-**In the current era of drastic innovations, cyclocryotherapy still stands the test of time in context to palliative care for patients of painful blind eye in our glaucoma clinics.

Keywords : Cyclocryotherapy; IOP reduction; Glaucoma; Painful blind eye

Introduction

Painful blind eye is a known entity, which all ophthalmologists come across in day-to-day practice. The blind painful eye is defined as an end stage where vision is unsalvageable and there is poorly responsive ocular discomfort.(1)
Common causes encompass clinical conditions of absolute glaucoma following trauma, end stage glaucoma, neovascular glaucoma, uveitis.(1) These refractory cases do not respond to bouquet of eye drops of pressure-lowering agents, steroid, and cycloplegic preparations to reduce pain. For such patients cyclodestructive procedures are the answer. Treatment modality in the past incorporated procedure like cyclocryotherapy, cyclodiathermy, cyclophotocoagulation, retrobulbar alcohol injection and evisceration.(2,3,4) Innovation & improvement has touched upon foresaid procedure as with any other domain of medicine & surgery. However, there are few instances where old procedure are still in vogue. We have tried to assess the outcome of cyclocryotherapy in patients of painful blind eye at glaucoma clinic of our tertiary care hospital.

Material Methos

It was a prospective; hospital based interventional study conducted at our tertiary care hospital for a duration of 36 months from January 2021 to December 2023. Ethical clearance obtained from institutional ethical committee. Out of total 836 glaucoma clinic patients, 20 patients who required cyclocryotherapy were included in present study.
Inclusion criteria: Patient of painful blind eye due to primary or secondary glaucoma, who consented to undergo cyclcryotherapy were included in the study.
Exclusion criteria: Retinal pathologies treated with anterior retinal cryopexy (ARC), as the root cause lies in the posterior segment of eye.

We recorded demographic details including age, sex, address. Patient underwent complete ocular examination including visual acuity , intraocular pressure (IOP) , anterior segment examination on slit lamp& fundus examination (if ocular media is clear). Patients were asked to rate their pain on a likert scale of 1 to 10 (10 being most painful). They were asked to rescale their pain 1 month post procedure. IOP was recorded pre and 3month post cyclocryotherapy. Success was pain scale less than 3 at three month/IOP less than 25/ patient off AGM at three monthfollow-up. Data was tabulated and analysed.

Statistical Analysis: Results were presented in percentages, mean and standard deviation (SD). Paired sample t-test was used to compare pre and post cyclo IOP at 3months. The p value <0.05 were considered significant.

Procedure

Cyclocryotherapy–We used peribulbar anesthesia for all our patients. A retinal cryo-probe with a diameter of 2.5 mm was applied directly on the intact conjunctival surface, 1.5mm posterior to limbus, thus being directly over the ciliary body. We limited to a maximum of 6 clock hours (180 degrees of the eye's circumference) in our single session. We used approximately 1 freeze-spot per clock-hour (60 seconds each at -80ºC).(5)

Proper care was taken to avoid the 3and 9 o'clock locations minimizing damage to the long posterior ciliary vessels and contact with adjacent lid tissue. Probe allowed to defrost completely before removing it from the tissue by thawing for 1 minute. In all cases, the probe applied in such a way that the margin of the ice-craters touched one another on each application. Following cryoprocedure, the eyes were patched for 24 hours. Post operatively, patients were prescribed 1% Atropine eye ointment twice daily for 2 weeks and eyedrop prednisolonone acetate 1% 4 times a day for a week, which was then continued 3 times a day for one week and tapered every week. Oral analgesics were given for 5 days. All patients continued pretreatment antiglaucoma medications for first two weeks and then tapered depending on the IOP. IOP were recorded at each 1 month, 2 month and 3 month.

Results

Out of total 836 glaucoma clinic patients, 20 patients required cyclocryotherapy. The mean age of the subjects was 57.2±14.5 years (Table 1). The male: female ratio was 0.8:1 (Table 2). Thefollow-up time was 3 months. Patient were mainly from rural areas (70%) (Table 3). The pre-treatment mean IOP of all patients was 41.35±10.76 mmHg and 18.22±6.49 mmHg at 3 month follow-up (Table 4). Significant reduction in IOP post cyclocryotherapy ($p<0.001$) at 3 month follow-up. Patient were mainly on a pain scale of 8-10 on presentation to glaucoma clinic. After one month, all twenty patients rescaled their pain less than 3 at three month follow up.

Patients underwent cyclocryotherapy for Primary Glaucoma in 4 patients and Secondary Glaucoma in 16 patients (Table 5). The Secondary glaucoma causes included neovascular glaucoma (56.2%),uveitic glaucoma (18.75%), pseudophakia bullous keratopathy (12.5%) &pseudoexfoliation glaucoma (12.5%) (Table 6).

Discussion

Various cyclodestructive modalities are there in the armamentarium of ophthalmologist for the treatment of painful blind eye including cyclodiathermy, cyclocryotherapy, ultrasonic ciliary body ablation and laser cyclophotocoagulation. (6,7)
Cyclocryotherapy, one of the oldest cyclodestructive method, involves freezing the ciliary processes from an external approach. It is based on rapid tissue freezing to temperatures around -80 °C, which results in the formation of intracellular microcrystals with consequential damage to the ciliary body epithelium. Moreover, obliteration of small blood vessels and necrosis of the ciliary body contribute to decreased aqueous synthesis. Consequently, reduced aqueous production leads to IOP lowering to an acceptable level.(8,9)
In present study, Out of total 836 patients attending the glaucoma clinic, 20 patients required cyclocryotherapy. It accounts for 2.4%. The number is very less in contrast to high volume of such category patient, which was encountered a decade before. More awareness, prompt treatment facilities, advanced medical management has led to abrupt decline in incidence of painful blind eye. Similar low numbers are in other recent studies. (10)

Patient were mainly from rural areas comprising approximately 70% of presenting cases (Table 3). This highlights the fact that the medical facilities and awareness has still a long way to reach these out skirts areas.

The follow-up time was 3 months. The mean IOP in all patients was 41.35±10.76 mmHg on presentation to glaucoma clinic. It reduced drastically to 18.22±6.49 mmHg at 3 month follow-up after cyclocryotherapy.Fall in intraocular pressure was statistically significant (p=<0.001) in our patient in the present study. Similar result reported in other studies as well to show the efficacy of the procedure.(10,11). All patients were followed for a period of 3 months and were satisfied. One of the patients required a second sitting of other 180 degree at 2 months follow up. Thus, we attained a significant success with the results of cyclocryotherapy a 3 months.
Patient were mainly on a pain scale of 8-10 on presentation to eye OPD. At three months of presentation, all the patients felt symptomatically better. All patients rescaled their pain less than 3 at likert pain scale. This observation was collaborating to reduction of IOP. We obtain a significant result in the success criteria as taken in methodology.

Fall in intraocular pressure was statistically significant in our patient in the present study. Cyclocryotherapy setup is economical & budget friendly. procedure does not need any special OT setting or microscope. Probe is easy to maintain & use repeatedly. Patient with systemic co-morbidity can easily undergo the procedure as it takes couple of minutes.
Further studies with more number of patients and longer duration of follow up may be required to assess the benefits of cyclocryotherapy at large.

Conclusion

The aim of treatment of blind painful eye is pain alleviation. In the current era of drastic innovations, cyclocryotherapy still stands the test of time in context to palliative care. It is a boon for developing country where cost is a concern.

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Table 1: Age distribution of patients

Age distribution (in years)	Number of patients(n)	Percentage
21-40	3	15%
41-60	9	45%
61-80	6	30%
>80	2	10%
Total	20	100%
Mean age	57.2±14.50years	

(n):number of patients

Table 2: Gender distribution of patients

Sex distribution	Number of patients (n)	Percentage
Male	9	45%
Female	11	55%
TOTAL	20	100%

(n):number of patients

Table 3: Address distribution of patients

Address distribution	Number of patients (n)	Percentage
Urban	6	30%
Rural	14	70%
TOTAL	20	100%

(n): number of patients

Table 4: Mean Intra Ocular Pressure Pre and 3 months post cyclocryotherapy follow up

Pre-cyclocryotherapy IOP (mmHg)	Post-cyclocryotherapy IOP(mmHg)
41.35±10.76	18.22±6.49
p=<0.001 (significant)	

IOP: Intra Ocular Pressure

Table 5: Distribution of Primary and Secondary Glaucoma

Causes	Number of patients (n)	Percentage
Primary glaucoma	4	20%
Secondary glaucoma	16	80%
TOTAL	20	100%

(n): number of patients

Table 6:Distribution of causes of secondary glaucoma

Causes	Number of patients (N)	Percentage
Neovascular galucoma	9	56.2%
Uvetic glaucoma	3	18.75%
Pseudophakia Bullous Keratopathy	2	12.5%
Pseudoexfoliationglaucoma	2	12.5%
Total	16	100%

(n): number of patients