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**ORIGINAL ARTICLE**

# MANAGEMENT OF ABSOLUTE GLAUCOMA: EXPERIENCE OF RAS DESTA DAMTEW HOSPITAL, ADDIS ABEBA, ETHIOPIA

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## ABSTRACT

***Introduction:*** *Absolute glaucoma is the final stage of blindness in glaucoma and it is the most common reason leading to painful blind eye. This study was conducted to identify the frequency of absolute glaucoma, pain associated with glaucoma subtypes and practical treatment options for case presenting with the condition in the Ethiopian setting.*

***Methods****: This is hospital-based cross sectional study was conducted from Sep 1,2013 to Dec 30, 2013 at Ras Desta Hospital, Department of Ophthalmology. The diagnosis of absolute glaucoma was made based on history and ophthalmic examinations. Once diagnosed, those who had pain were started on Atropine and Dexamethasone eye drops. If pain did not-resolve, retro-bulbar injection of absolute alcohol was given. Enucleation was done if the pain persisted after the injection of absolute alcohol. Data was entered on to a computer and analyzed using SPSS for windows.*

***Result****s: The study involved a total of 111 patients with absolute glaucoma. The majority of absolute glaucoma patients, 79(71.2%), had no pain. The remaining 32(28.8%) had pain and 21(65.6%) of them had got relief with topical steroid and atropine eye drops. For non-respondents, retrobulbar absolute alcohol injection was given and 7(21.9%) improved. Finally, the remaining 4(12.5%) patients eye were enucleated to relief intractable pain.*

***Conclusion:*** *-Management of painful absolute glaucoma in our setting should be started with topical steroid and atropine eye-drops. If this fails, the next step is retrobulbar injection of absolute alcohol, and finally if pain is intractable, enucleation is recommended.*

***Key words: -*** *Absolute glaucoma, pain, Management, no light perception, Ethiopia*

## INTRODUCTION

Glaucoma is the leading cause of irreversible blindness worldwide and it is next to cataract as common cause of blindness (1-3). Absolute glaucoma is the final stage of blindness in glaucoma and it is the most common reason leading to a painful blind eye (4). Other causes of painful blind eye include trauma, neoplasia, infections and inflammation (5). A blind painful eye presents several challenges for ophthalmologists with regard to its evaluation and management (6). Pain has a negative impact on the patients' quality of life as well as his ability to function in a productive manner (7).Various medical and surgical procedures have been described for the alleviation of pain; these include topical steroid with 1% atropine eye drops, nerve block with retrobulbar alcohol injection, cyclodestruction, enucleation and evisceration.

Retrobulbar alcohol has been used to provide relief to patients with painful blind eye since the early twentieth century (8). It provides near instantaneous and continual relief (6). Alcohol and other neurolytic agents exert their effect by destroying the nerve fibers by coagulativenecrosis (8,9).Cyclodestructiveprocedures include cyclodiathermy, cyclocryotherapy and cyclophotocoagulation that need special equipment and instruments. In Ethiopia, the management of absolute glaucoma is not given due attention and the magnitude of the problem is huge due to high prevalence and late presentation of glaucoma patients. Eye health professionals are treating absolute glaucoma patients with different expensive anti-glaucoma drops and systemic Acetazolamide that has serious side effects. The aim of this study was to evaluate the proportion of absolute glaucoma patients who develop pain in relation to glaucoma sub type and response of pain to management options routinely available in most eye services in Ethiopia.

## PATIENTS AND METHODS

This hospital based prospective cross sectional study was performed from September 1,2013to December 30, 2013 at Ras Desta Damtew hospital, department of Ophthalmology. Ras Desta Damtew Hospital is located in Addis Ababa and the department of Ophthalmology is established in 2000 G.C. The ophthalmic service rendered by the department include out-patient with different clinics, in-patient service with ten beds and separate rooms for

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both major and minor surgeries. The source population for the study was all ophthalmic patients with a glaucoma diagnosis. All consecutive patients with diagnosis of absolute glaucoma aged 18 year or above were included. Glaucoma cases were diagnosed by intraocular pressure above 21 mmHg, vision of no light perception, total excavation of optic disc and gonioscopy where possible by an ophthalmologist.

For those patients who had pain, the available management options were informed. The possible benefits and complications of all treatment modalities were discussed with the patients and if need be also with their families. After obtaining informed consents of the patients, they were first started with 1% atropine eye drops three times per day and 0.1% dexamethasone eye drops four times per day and appointed to come back after one month. If pain resolved, they were reviewed after two months. After taking eye drops for one month, if pain persisted retrobulbar injection of absolute alcohol was given. Retro bulbar injection of 1 ml of short acting 2% lidocaine to verify the pain relief and 1 ml of absolute alcohol (96%) was given by using the same needle after topical drop of 0.5%tetracaine drop and regional asepsis. Eye was patched for twenty-four hours and next day examined with advice to continue atropine and dexamethasone eye drops. Review was done after one month and if pain stopped, next visit was done after two months. Finally, if the pain was not resolved by injection, enucleation was done.

All patients diagnosed for absolute glaucoma were recorded. Data was entered into a computer and was analyzed using SPSS for windows. In the analysis, descriptive frequency distribution of the study subjects was performed, and is displayed using tables and figures as appropriate.

## RESULTS

A total of 111 absolute glaucoma patients were included. Fifty-nine (53.7%) were females and 52 (46.8%) were males. Laterality was almost equal and 69 (62.2%) were less than 65 years and 42 (37.8%) were above 65 years (Table 1). The subtypes of glaucoma included primary open angle glaucoma, pseudoexfoliativeglaucoma, secondary angle closure glaucoma and chronic angle closure glaucoma (Table 2). Thirty-four (30.6%) patients had intraocular pressure of less than 45mmHg. Intraocular pressure between 45-75 mmHg was found in 47 (42.4%) of patients and the remaining 30 (27%) had above 74mmHg (Table 3).

Table1.Demographic characteristics of absolute glaucoma patients. Ras Desta Damtew Hospital, September 1, 2013 to December 30, 2013, Addis Ababa, Ethiopia

| | | Frequency | Percent |
|---|---|---|---|
| Sex | | | |
| | Female | 59 | 53.2 |
| | Male | 52 | 46.8 |
| Laterality | | | |
| | OS | 56 | 50.5 |
| | OD | 55 | 49.5 |
| Age | | | |
| | <65 year | 69 | 62.2 |
| | 65 or more | 42 | 37.8 |
| Total | | 111 | 100 |

Table2.Subtype of glaucoma seen in the study population, September 1,2013to December 30, 2013 Ras Desta Damtew Hospital, Addis Ababa

| | Frequency | Percent |
|---|---|---|
| POAG | 59 | 53,2 |
| PXF | 21 | 18.9 |
| 2 ACG | 30 | 27 |
| CACG | 1 | 0.9 |
| Total | 111 | 100 |

Addis Ababa, Ethiopia.

Table 3.Distribution of the Intraocular pressure in the study population, September 1,2013to December 30, 2013, Ras Desta Damtew Hospital. Addis Ababa

| | Frequency | Percent |
|---|---|---|
| <45 | 34 | 30.6 |
| 45-74 | 47 | 42.4 |
| >74 | 30 | 27.0 |

The majority of absolute glaucomapatients, 79 (71.2%), had no pain at all. The remaining 32(28.8%) patients had pain and treated with 0.1% dexamethasone and 1% atropine eye drops and 21(65.6%) got relief. For 11(9.9%) non respondents, retrobulbarabsolute alcohol injection was given and 7 (21.9%) improved. Finally, the remaining 4 (12.5%) patients' eye were enucleated to relief intractable pain (Fig. 1)

Patients with diagnosis of secondary angle closure glaucoma were those who developed pain 25(78.1%) and only 7(18%) patients with diagnoses of primary open angle and pseudoexfoliative glaucoma subtypes developed pain and this is statistically significant at $p<0.001$. As intraocular pressure increased the risk of having pain increased. This is statistically significant $p<0.05$ (Table4).

Fig1. Treatment options for cases of absolute glaucoma, September 1,2013to December 30, 2013,

Ras Desta Damtew Hospital. Addis Ababa

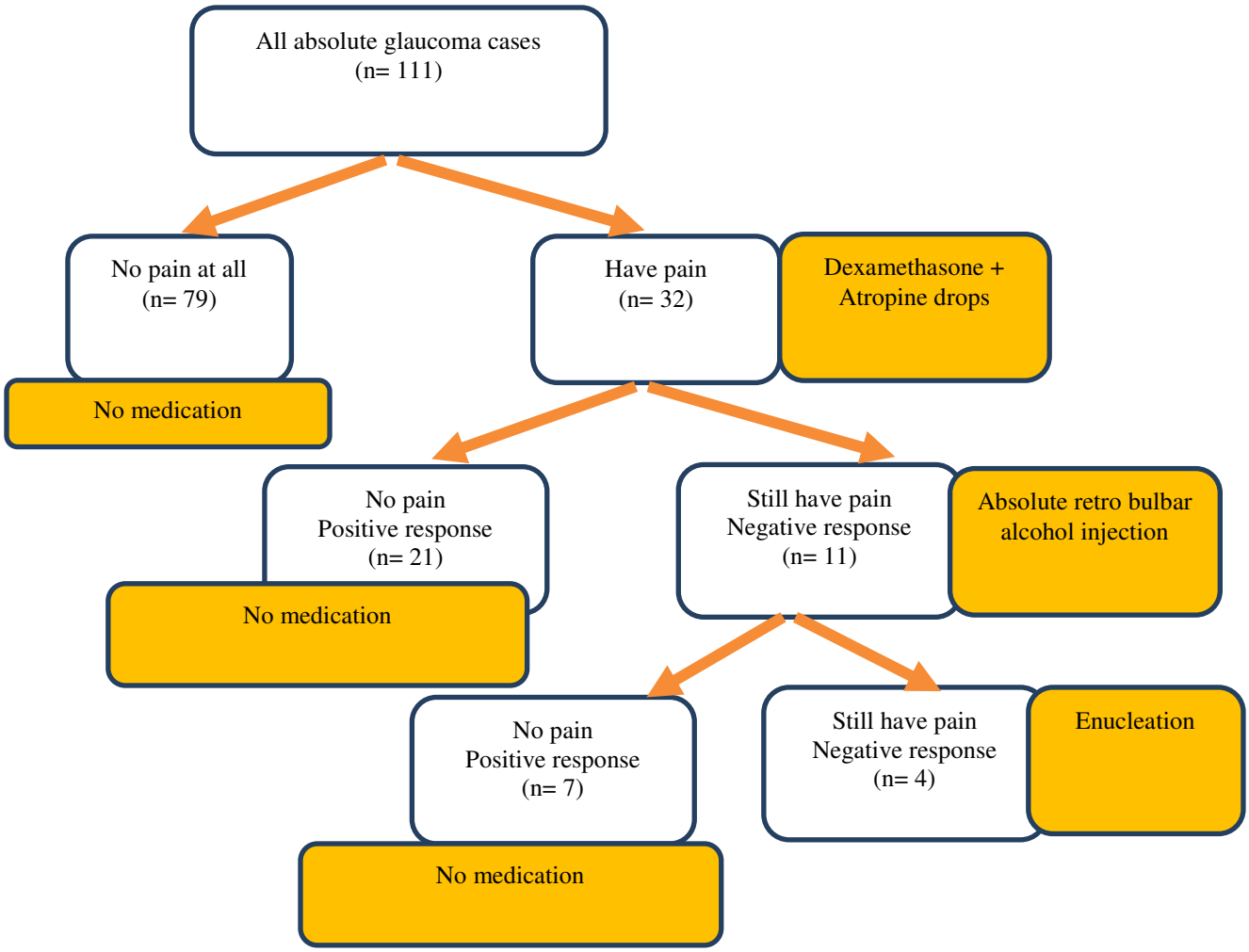

Table4. Comparison of pain by subtype of glaucoma and intra ocular pressure of patients with absolute glaucoma, Ras Desta Damtew Hospital. Addis Ababa, Ethiopia.

| | Pain | No pain | OR (95% CI) |
|---|---|---|---|
| Subtype of glaucoma | | | |
| 2 ACG | 25(80.6) | 6(19.4) | 39.5 ( 7 , 218 ) |
| POAG | 5(8.5) | 54(91.5) | 0.88 ( 0.1 ,5) |
| PXF | 2(9.5) | 19(90.5) | 1.00 |
| Intra ocular pressure | | | |
| <45 | 4(11.8) | 30(88.2) | 1.00 |
| 45-74 | 14(29.8) | 33(70.2) | 3.18 ( 0.9 ,10.7 ) |
| >74 | 14(46.7) | 16(53.3) | 6.56 (1.8 , 23.3) |

## DISCUSSION

Visual loss due to glaucoma is irreversible and the main purpose of management is to preserve the remaining vision before it is lost completely. If once vision is turned to be no perception of light, there is no reason to treat. However, few patients develop severe pain that requires management.

The management of absolute glaucoma in Ethiopia is not given due attention and eye professionals treat patients with different anti-glaucoma medications; which are not necessary, expensive and associated with serious side effects specially Acetazolamide. Treatment of all diseases should be started with options of simple and relatively safe ones and aggressive and invasive approach is justifiable when the previous fail.

This review showed that the majority of absolute glaucoma (>70%) do not develop pain especially primary open angle glaucoma and pseudoexfoliative glaucoma, which are common in Ethiopia, and there is no need of treatment.

Secondary absolute angle closure glaucoma and few other subtypes develop pain and the preferred initial treatment is topical steroid and 1% atropine eye drops. Most of the absolute painful glaucoma patients respond with this regimen and if not, we can proceed to retrobulbar injection of absolute alcohol. Despite above management, if pain persists we remove the eye.

Retrobulbar administration of alcohol has been used for pain control since the 1900s with reported success rate of 20-87% and the duration of pain relief of 2 weeks to 2 years (4). The pain relief with alcohol is provided by the coagulation of protein and precipitation of lipids of the sensory nerve fibers and the recurrence of pain is related to the degree of nerve destruction (4,10). The retrobulbar alcohol injection has some potential complications which should also be considered carefully (11,12). These complications may be due to both alcohol and block itself. Alcohol may cause cellulitis, eyelid edema and conjunctivalchemosis by penetrating intraocular tissuesand forming a temporary tissue reaction(12). Blepharoptosis and external ophthalmoplegia are associated with infiltration of the motor nerves by alcohol or retobulbar hemorrhage. However, these complications are frequently temporary and require no specific treatment in blind eye and resolve in days.

Retrobulbar block is our daily practice when we do intraocular surgeries in Ethiopia and every eye professional can do it without difficulty. Short acting local anesthetics such as lidocaine are administered before injecting absolute alcohol, which not only correct placement of the needle in the retro bulbar space, but also provides an anesthetic effect that reduces intraoperative pain (13).Retrobulbar alcohol injection is safe and effective. The success rate of this study is comparable to others (14-16).

Most of secondary angle closure subtypes of absolute glaucoma cases were those who developed pain and they were accompanied by intraocular inflammation. The risk of developing pain was almost four times greater in secondary absolute angle closure glaucoma when compared to primary open angle and pseudoexfoliative absolute glaucoma. Atropine and Dexamethas one eye drops help to treat this inflammation and there by relief pain. This shows us that pain of absolute glaucoma depends not only on extent of intraocular pressure, but also to the severity of eye inflammation.

The majority of absolute glaucoma patients do not develop pain and hence there is no need of treatment. Most of the time, secondary angle closure sub type of absolute glaucoma patients can have pain whereas commonly seen primary open angle and pseudoexfoliative absolute glaucoma do not. Management of painful absolute glaucoma in our setting is better if started with topical 1% atropine and 0.1% dexamethasone eye drops. If this management fails, the next step is retro bulbar injection of absolute alcohol, and finally if pain is intractable, enucleation is recommended. Patients were followed only for few months and verbal analogue pain scores (VAS) was not used. Further study with long duration to see long term effect of drops and alcohol injection and use of VAS is needed.

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