TOPICAL LATANOPROST IS EFFICTIVE IN REDUCING INTRAOCULAR PRESSURE IN TREATMENT OF CONCOMITANT PRIMARY OPEN-ANGLE GLAUCOMA AND CATARACT: A TERTIARY INSTITUTION EXPERIENCE

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AUTHOR'S CONTRIBUTION

The sole author designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

Background and Aim: Latanoprost reduces the intraocular pressure in adult by 20–35% without significant adverse reactions. It is a useful remedy in management of primary open angle glaucoma. This study aimed to indicate latanoprost to patients presented with concomitant illnesses of primary open angle glaucoma and cataract and to observe the responsiveness.

Materials and Methods: This study was done in the Department of Pharmacology, College of Medicine at the Anbar University in cooperation with Al-Ramadi Teaching Hospital in Ramadi, Iraq. A total number of 17 patients were enrolled in this study, seven of them presented with primary open angle glaucoma without cataract (Group I) and 10 of them with cataract (Group II). The patients were treated with 0.005% latanoprost (eye drops) once daily for 4 weeks.

Results: The mean ± SD of the intraocular pressure of the right and left eye at the time of the entry into the study (before treatment) were 23.9± 4.3 mmHg and 24.4±8.9 mmHg respectively for Group I and 26.3 ±3.3 mmHg and 24.5 ± 7.3 mmHg respectively for Group II, which did not show significant difference. Four weeks treatment with latanoprost resulted in a significant reduction of intraocular pressure of the right and left eyes by 27.6 % and 26.2% respectively in Group I and by 39.2 % and 32.7% respectively in Group II.

Conclusion: Latanoprost is a safe medication for concomitant primary open angle glaucoma with cataract and it reduces the intraocular pressure in the cataract eye by more than 10% higher than non-cataract eye.

Keywords: Latanoprost; primary open angle glaucoma; cataract; effectiveness; safety.

1. INTRODUCTION

Latanoprost is a prostaglandin F2α derivative that increased the uveo-scleral outflow which leading to lower the intraocular pressure. It reduces the intraocular pressure in adult by 20–35% without any significant adverse reactions. The effect of latanoprost on the intra-ocular hypertension is a dose dependent and a reduction of IOP by 5.9 mm Hg was observed with using 100 µg/ml) [1]. There is evidence that once-daily dosing was similar or even more effective than twice-daily dosing in healthy subjects and in patients with ocular hypertension and/or glaucoma [2]. It is more effective in controlling the intra-ocular pressure in patients with primary open-angle glaucoma than the beta-adrenoceptor blocking agent

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notably the timolol[3,4].A single evening dose of fixed-combination of latanoprost 50µg/ml and timolol 0.5 mg/ml is effective treatment of primary open-angle glaucoma compared with monotherapy of timolol or latanoprost [5]. A broad spectrum of local adverse reactions were reported including burning sensation, conjuctival hyperemia, dark pigmentation of the skin surrounding the eye, iris and eyelashes and reactivation of the anterior uveitis[6].This study aimed to look for the effectiveness and the safety of topical latanoprost in patients presented with combined eye pathology of primary open-angle glaucoma and cataract.

2. MATERIALS AND METHODS

This study was done in the Department of Pharmacology, College of Medicine at the University of Anbar in cooperation with Al-Ramadi Teaching Hospital in Ramadi, Iraq from May to October 2015. The study was approved by the Institutional Scientific Committee. An ethical consent form obtained from the Office of the Research that belonged to the Ministry of Health and applied to the participants of this study. The patients who attended the Consultant Clinic of Ophthalmology at Al-Ramadi Teaching Hospital were recruited. The criteria of inclusion were patients with primary open-angle glaucoma who had an intraocular pressure of ≥21 mmHg (unilateral or bilateral) and cataract. The criteria of exclusion included intraocular pressure of < 21 mmHg had a history of angle closure, traumatic, inflammatory, pseudoexfoliation, pigmentary or neovascular glaucoma, previous filtering surgery or argon laser trabeculoplasty, uncontrolled asthma, pregnancy and lactated mother. The design of this work is the assembly of the open-label clinical trial. The patients were assigned as primary open-angle glaucoma with or without cataract. Therefore, the participants were sub-grouped into:

Group I (*n*=7): primary open-angle glaucoma without cataract
Group II (*n*=10): primary open-angle glaucoma with cataract

The patients were treated with 0.005% latanoprost (eye drops) once daily for 4 weeks. During the 1st visit (baseline) demographic information, ocular and medical histories, and concomitant medications were documented; visual acuity was measured; thorough slit-lamp biomicroscopy including eyelid examination, gonioscopy, and fundoscopy were performed by ophthalmologist using (+90) Volk lens. A manual visual field examination was conducted at baseline (using Goldmann perimeter) and intraocular pressure was measured prior to pupil dilation using an air-pulsed tonometer and a calibrated Goldmann applanation tonometer. The patients were followed-up weekly up to 4 weeks after starting the treatment. At each visit, eye examination was performed as mentioned at the time of the entry into the study. Adverse events were followed until they resolved or stabilized.

2.1 Statistical Analysis

The results expressed as number, percentage and mean ±SD. The data were analyzed using Student's t test (paired and unpaired, two tailed) taking the lowest limit of significance is the probability of ≤ .05**.**

3. RESULTS

Table 1 shows the characteristics of the participants enrolled into the study. The ratio of male to female of the all participant was 3.25. The mean age of Group II patients was non-significantly(*p*=.171) higher than corresponding value of the Group I. Family history of glaucoma was reported in two out of ten patients belonged to the Group II. History of systemic arterial hypertension and diabetes mellitus observed in 3 and 5 patients of the Group II participants while none of these illnesses observed in the Group I. In the Group I, intraocular pressure of ≥ 21 mmHg was observed in both eyes in 4 patients compared with 5 patients in Group II. Two patients of Group II had only one eye, that is, lost for reasons other than glaucoma or cataract. The mean ± SD of the intraocular pressure of the right and left eye at the time of the entry into the study (before treatment) were 23.9± 4.3 mmHg and 24.4±8.9 mmHg respectively for Group I and 26.3 ±3.3 mmHg and 24.5 ± 7.3 mmHg respectively for Group II. There were non-significant differences between Group I and Group in the intraocular pressure of the right eye (*p*=.254) and of the left eye (*p*=.986). In the Group I, four weeks treatment with latanoprost resulted in a reduction of intraocular pressure of the right eye from 23.9±4.3 mmHg to 17.3±1.6 (*p*=.004) and of the left eye from 24.4±8.9mmHg to 18.0±3.4mmHg(*p*=.112), that is the intraocular pressure is reduced by 27.6 % and 26.2% respectively (Figs. 1 and 2). In the Group II, latanoprost reduced the intraocular pressure of the right eye from 26.3±3.3 mmHg to 16.0.3±2.4 (*p*<.001) and of the left eye from 24.5±7.3mmHg to 16.5±2.4mmHg (*p*=.007), that is the intraocular pressure is reduced by 39.2 % and 32.7% respectively (Figs. 1 and 2).

4. DISCUSSION

The results of this study show that the effectiveness of latanoprost in the management of open angle glaucoma that coexisted with cataract is superior

compared with glaucoma in absence of cataract. This effect is free from adverse reactions whether locally on the eye or systematically. Most studies referred to be cautious in using latanoprost in patients presented with concomitant glaucoma and cataract. Moghimi etal (2012) found that topical application of latanoprost after cataract surgery did not cause significant effects on the macula of the eye [7]. In this study, the topical latanoprost was applied when both glaucoma and cataract coexisted. In the experimental animal model using dogs, latanoprost failed to reduce the intraocular pressure after phacoemulsification and aspiration of cataracts [8], a finding that does not agree with the present study because the increase intraocular pressure was induced by medication. Recent study focused on the initial treatment of the cataract when it coexisted with acute angle closure glaucoma as the surgical management of the cataract resulted in the reduction of the intraocular pressure without using drugs that reduce the intraocular pressure [9]. In the present study, the pharmacotherapy of open angle glaucoma was initiated without providing any surgical intervention for cataract and the application of latanoprost provides a significant reduction of intraocular pressure in the eye complicated with cataract. Cataract surgery e.g. phacoemulsification is a procedure that potentially reduce the intraocular pressure which is sustained even after surgery [10] while in another study the latanoprost reduced the intraocular pressure without producing any harmful or beneficial effects on the cataract eye. Moreover, surgical intervention using implantation of supracoroidal micro-stent is applicable for management of concomitant illnesses of cataract and glaucoma which carried a low incidence of complication and reducing the intraocular pressure [11]. This study adds new information that latanoprost exerts a promising low intraocular pressure when cataract is a concomitant illness. This observation highlights that latonoprost may exert a pharmacological action on the pathogenesis which required to disclose. One of the limitations of the study is a small sample size.

Table 1. Characteristics of the participants enrolled in the study

	Group I (*n*=7)	**Group II (*n*=10)**
Gender (Male: Female)	6:1	7:3
Age	57.9±16.9	68.3±9.4
Family history of glaucoma	0	2
History of:		
Diabetes mellitus	0	3
Hypertension	0	5
Intraocular pressure ≥ 21 mmHg		
Right eye	6	8
Left eye	5	7
Both eyes	4	5
Lost eye	0	2

The results are expressed as number and mean± SD

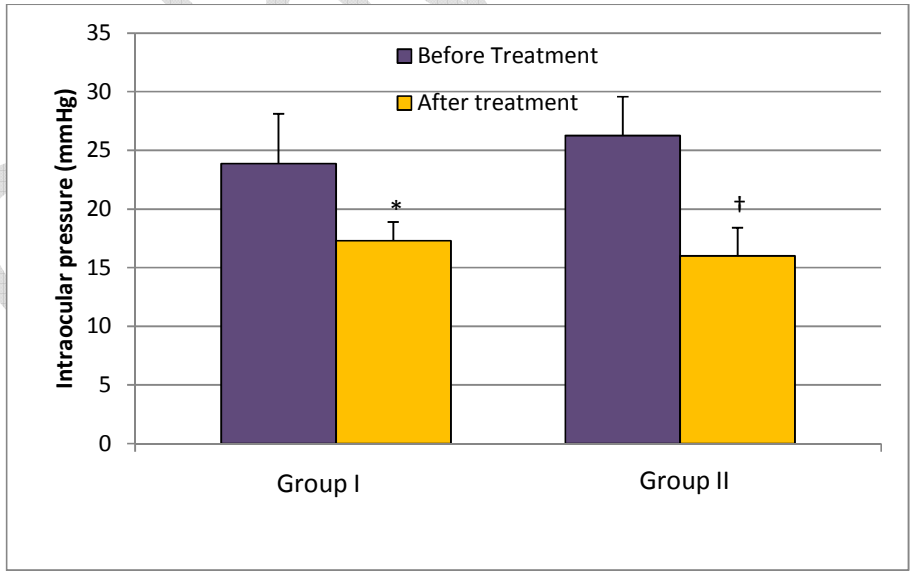

Fig. 1. Effect of single application per day of latanoprost eye drop (0.005%) on the intraocular pressure of the right eye of patients presented with glaucoma without cataract (Group I) and with cataract (Group II)

** p=.004 and †p < .001 significant difference compared with "Before treatment" for each group*

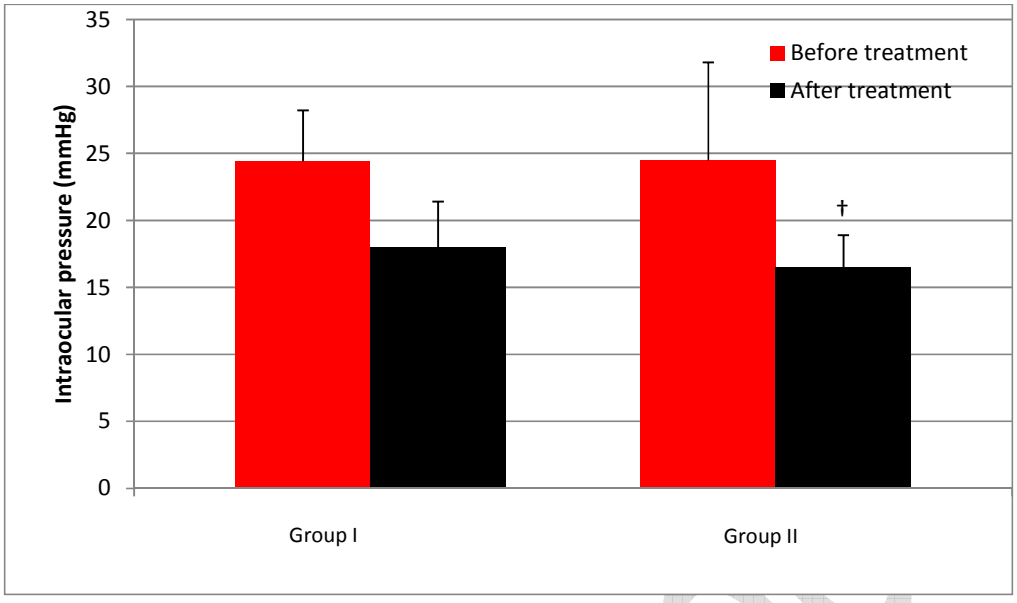

Fig. 2. Effect of single application per day of latanoprost eye drop (0.005%) on the intraocular pressure of the left eye of patients presented with glaucoma without cataract (Group I) and with cataract (Group II)

†p=.007Denote the significant difference compared with "Before treatment" for each group

5. CONCLUSION

It concludes that latanoprost is a safe medication for concomitant primary open angle glaucoma with cataract and it reduces the intraocular pressure in the cataract eye by more than 10% higher than non-cataract eye.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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