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EFFECTS OF SUB-TENON STERIOD IN PAN RETINAL PHOTOCOAGULATION IN DIABETIC RETINOPATHY

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Abstract:

Objective: *The study is focused on the analysis of visual consequences in patients who suffer from diabetic retinopathy. The patients involved were treated using pan retinal photocoagulation with or without sub-Tenon triamcinolone acetonide.*

Patients and Methods: *The subjects were divided into two groups based on the treatment i.e. sub-tenon triamcinolone with pan retinal photocoagulation (Group 1) and pan retinal photocoagulation alone (Group 2). The cases were randomly distributed among both the groups. Change in visual acuity was considered to be the only major variable factor in this study. Visual acuity was checked after two months from the treatment and difference was measured from the standard readings.*

Results: *The patients treated with a combination of sub-tenon triamcinolone and pan retinal photocoagulation showed improvement in visual acuity much greater than the patients who were treated with pan retinal photocoagulation only. The difference was statistically significant ($p < 0.005$). 73% of patients in Group 1 were having improved visual acuity as compared to only 6.6% of patients in Group 2.*

Conclusion: *Sub-Tenon triamcinolone acetonide injection has proved to be an outstanding treatment in the deterrence of pan retinal photocoagulation. The visual acuity has improved much with the dose of the said injection and the visual loss caused by macular edema is minimized.*

Keywords: *Diabetic retinopathy, sub-Tenon triamcinolone acetonide injection, Visual acuity.*

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INTRODUCTION:

People around the world are suffering from the diabetic retinopathy and it has become a primary reason for visual loss. The Early Treatment Diabetic Retinopathy Study (ETDRS) has revealed that pan retinal photocoagulation (PRP) laser treatment has the potential to minimize the risk of partial or complete blindness. PRP worked for the patients with high-risk proliferative diabetic retinopathy. Despite the fact that pan retinal photocoagulation can stop the proliferation of the disease in affected retinas. It can intensify the macular edema which is the major cause of visual disorder [1]. Many factors are induced and released due to PRP treatment. VEGF (vascular endothelial growth factor) is one of them. Propagation of macular edema in macula is catalyzed by VEGF. It has been observed that steroids present in ocular system have the tendency to reduce the blood-retinal barrier. Sub-Tenon injection, when used with PRP, has produced exceptional results in the treatment of diabetic retinopathy [2].

This work was outlined to assess the adequacy of sub-tenon infusion of triamcinolone (PSTA) with PRP in patients with extreme non-proliferative or proliferative diabetic retinopathy against patients treated as it were with PRP.

PATIENTS AND METHODS:

The study was conducted at Nishtar Hospital Multan. The comparative study was conducted randomly. The subjects were divided into two groups and the results were matched after both treatments. The study was carried out in a time span of one year from January 2016 to January 2017. Patients who participated in the study were informed and their written willingness to undergo the research was obtained. The subjects were selected irrespective of gender and with ages of 30 or more with type 1 or type 2 diabetes mellitus. The subjects selected for the trial were patients with non-proliferative diabetic retinopathy (NPDR) or proliferative diabetic retinopathy (PDR) with clear visual media and no other illness in either eye. The patients seem to have clinically critical macular edema (CSMO) as characterized by the ETDRS because it was on the off chance that it was display in both eyes. The respondents of the study had to experience a total ophthalmic examination, counting best-corrected visual acuity (BCVA), slit-lamp bio microscopy, fundoscopy, applanation tonometry, and fluorescein angiography. Patients suffering from any other eye disease such as pan retinal or focal photocoagulation, vitrectomy, vitreous hemorrhage, vitreomacular traction, periocular or intraocular steroid use within the past 6 months, glaucoma, or ocular hypertension were excluded from the study.

Group 1 (PSTA with PRP) and Group 2 (PRP alone) were allotted eyes randomly. People who tested visual acuity, specialists, and those performing statistical analysis were masked. Subjects and examiners were not masked. Triamcinolone acetonide (TA) 20 mg in a volume of 0.5 ml was infused within the inferotemporal quadrant under local anesthesia with Xylocaine 1 week before initial PRP session for Group 1 whereas Group 2 members were not given any TA injection. PRP was performed four times at 2-week interims; laser spot estimate was calculated to be 200-300 pm, power was 150-200 MW, and the duration, 0.2 s. The total numbers of burns at the end of 4^{th} session was 1600 approx. Xylocaine was used for the anesthesia of all patients. The study was terminated when a change in visual acuity BCVA is observed at the end of 8^{th} month routine examination. The BCVA is compared with baseline and evaluated with the Snellen visual acuity chart. On each visit BCVA, intraocular pressure (IOP), slit- lamp assessment, and indirect ophthalmological measurements were applied. Fluorescein angiography was performed at baseline and 2 months. Thirty eyes in each group were required to acquire 80% power based on an unpaired Student t test with a two- sided significance level of 0.05. Statistical techniques were employed for furnishing of results. For this purpose, SPSS version 17.0 was utilized. Values are expressed as mean (Standard Deviation). A p-value of less than 0.05 was considered to be statistically significant. The data was analyzed by using student t test.

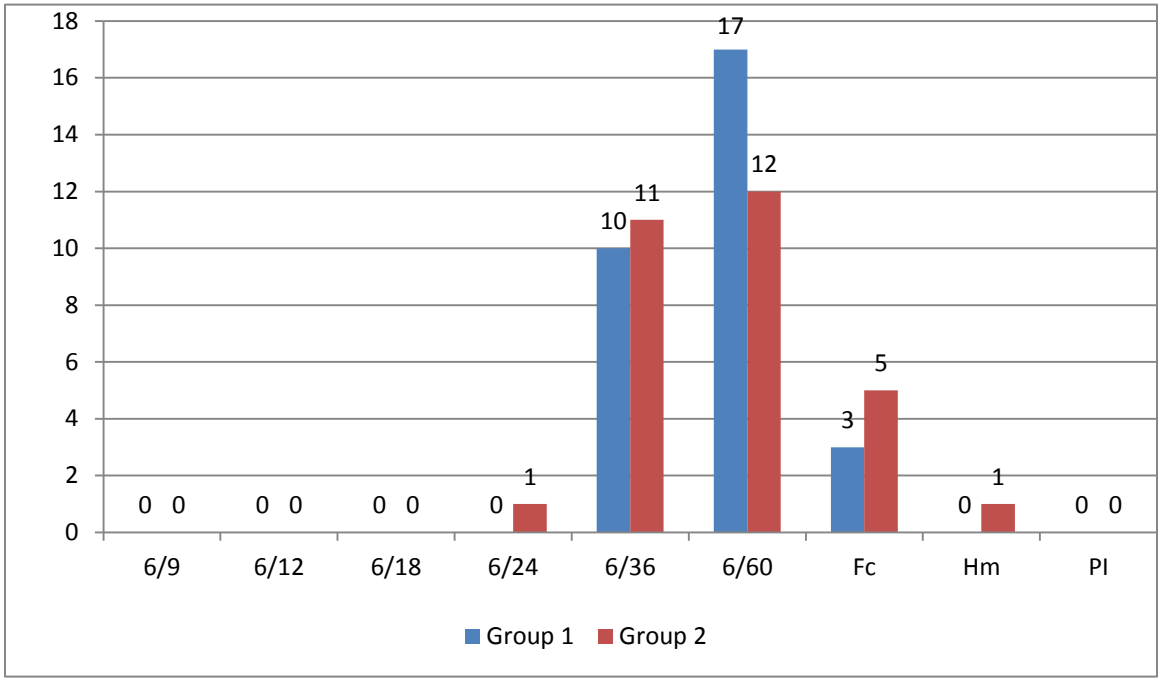
RESULTS:

Out of total 60 cases 32 patients (53.3%) were males and 28 (46.7%) were females. The subjects were within the age range of 30 to 83 years. The mean value for age was calculated and found to be 63.3 years ± 7.35. Both groups were randomly selected with 30 subjects in each group irrespective of gender. The groups were formed keeping in view that the baseline characteristics are well balanced. At the baseline no significant difference was seen in BCVA of the subjects of each group. BCVA was measured one day before PRP treatment and in 1st and 8^{th} week after PRP. Pre-laser visual acuity is shown in Table I. Post PRP visual acuity was statistically significant ($p < 0.05$). Twenty-two subjects from Group 1 showed improvement in visual acuity of one or more lines. The visual acuity number for group two was as low as 2. After PRP, 67.7 % subjects of group 1 came up with visual acuities better than 6/24 whereas only 3.33 % of Group 2 subjects had 6/24 or better acuities. Group 1 patients were all good with their pretreatment visual acuity but 36.67 % of Group 2 subjects had visual acuities poorer than 6/18 after the treatment (Table II). Six of the subjects (20 %) of Group 1 which were injected were seen with the symptoms of bleeding blood vessels in conjunctiva a condition known as subconjunctival hemorrhage. The condition was set after

2-3 weeks without any outer influence. Group 2 subjects did not show any complications.

Table I: Baseline visual acuity in all patients (n=60)

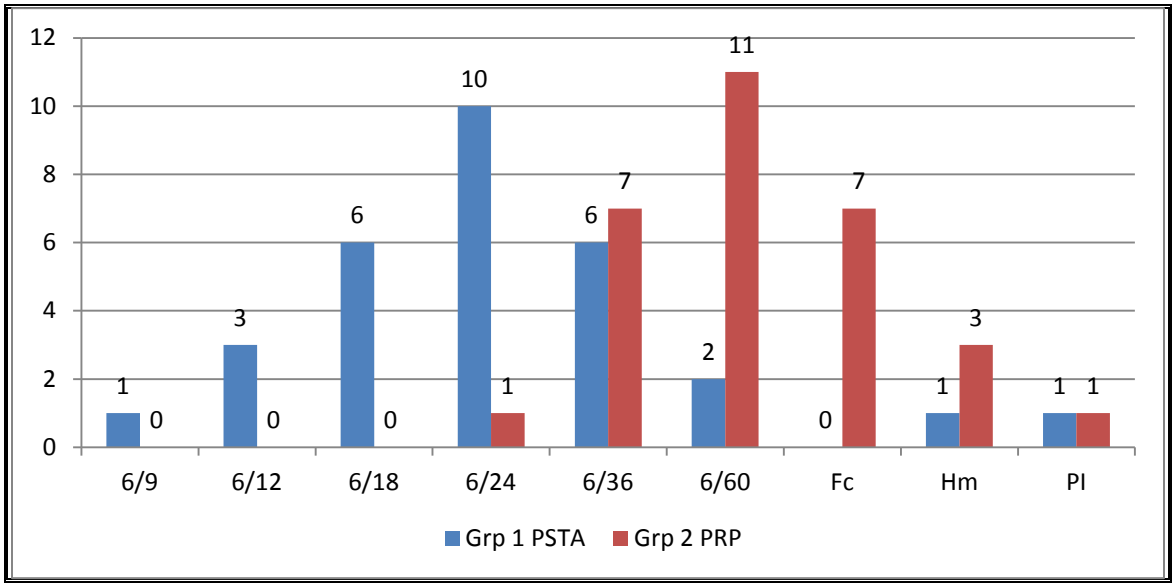
Baseline vision in control group	GROUP 1 (n=30)	GROUP 2 (n=30)
6/9	0	0
6/12	0	0
6/18	0	0
6/24	0	1
6/36	10	11
6/60	17	12
Fc	3	5
Hm	0	1
PI	0	0
Total	30	30



Baseline Visual Acuity

Table II: Post procedure visual outcome in patients in Group 1 (posterior sub tenon triamcinolone acetonide + pan retinal photocoagulation) and Group 2 (pan retinal photocoagulation alone) n=60

Post intervention visual acuity	Group 1 PSTA group	Group 2 PRP only control	Total
6/9	1	0	1
6/12	3	0	3
6/18	6	0	6
6/24	10	1	11
6/36	6	7	13
6/60	2	11	13
Fc	0	7	7
Hm	1	3	4
PI	1	1	2
Total	30	30	60



Post Procedure Visual Outcome

Visual acuity is better in Group 1 compared with Group 2.

Fc = finger counting Hm = Hand movement Pl = Perceives light

DISCUSSION:

Pan retinal photocoagulation (PRP) can decrease the incidence of visual loss or blindness. Diabetic macular edema patients, when treated with triamcinolone acetonide along-with sub-tenon injection has produced excellent results [3]. Some studies conclude that its effects are temporary. During the current research, BCVA values measured after two months of the procedure for Group 1 were statistically greater than the BCVA value for Group 2 [4]. Another study on this topic, BCVA values for cases were lower than controls. The values drifted each month for both groups and were difficult to monitor. Foregone in view, it is possible that Posterior Sub-tenon TA injection prevents PRP induced macular edema hence minimizing the risk of visual loss [5].

Hence, PSTA may be utilized to avoid the visual disintegration after PRP in patients with diabetic retinopathy. Periocular infusion of triamcinolone acetonide can have unfavorable responses, counting increments in intraocular pressure (IOP) and cataract formation. The mean IOP of eyes in was not statistically distinctive between standard at each follow-up visit for both groups [6]. This finding underpins the truth that expanded IOP is frequently reported following after intravitreal administration of triamcinolone acetonide, in spite of the fact that it is once in a while detailed with sub- tenon administration [7]. Whereas no eye had cataract development amid us ponder period, we cannot conclude that a single sub-Tenon capsule infusion of triamcinolone acetonide would have no impact on cataract arrangement since steroid-induced cataract arrangement may take longer than 2 months to gotten to be appear [8]. Other potential complications of PSTA might include blepharitis's, orbital fat atrophy, strabismus, and conjunctival necrosis. However, no such symptoms were observed during this case-control study [9].

One barrier of the study is the utilization of an observation arm as control, instead of a pretense infusion, making it inconceivable to guarantee that the patients and agents were masked with respect to treatment [10]. Be that as it may, we compensated for this confinement by guaranteeing that the specialists who performed the visual acuities were masked. The activity was done at a single center instead of different centers and included people of one race. These are the components that restrain our capacity to generalize the outcomes [11].

CONCLUSION:

Sub-Tenon triamcinolone acetonide injection has proved to be an outstanding treatment in the deterrence of pan retinal photocoagulation. The visual acuity has improved much with the dose of the said injection and the visual loss caused by macular edema is minimized. In any case, bigger trials are required to explain the pertinence of this treatment choice.

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