

Comparison of Visual Fields of Medically and Surgically Regulated Open-Angle Glaucoma Patients

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Abstract

Purpose: To compare the visual field changes of medically or surgically regulated ocular tensions of patients with open angle glaucoma followed up for two years

Materials and Methods: Twenty one medically and 17 surgically regulated open angle glaucoma patients were included the study. Complete ophthalmic and gonioscopic examinations are made. For all patients at the beginning and every three months, visual field analysis with Humphrey 30-2 standard test was also performed. For diagnosing visual field changes we used glaucoma progression analysis statistical program of Humphrey Visual Field Analyser750 II-A (Carl Zeiss Meditec-USA). We used t-test for calculating age difference and Fisher's D2 test to compare visual field worsening. To compare the visual acuities and ocular tensions between two groups, we were used unpaired t-test.

Result: We did not find visual field worsening difference between medical and surgical group($p=0.49$, $p>0.05$).

Özet

Amaç: Oküler tansiyonları cerrahi veya medical tedaviyle regüle olan primer açık açılı glokomlu olguların görme alanı değişikliklerinin iki yıllık takipte farklılık gösterip göstermediğinin tespit edilmesi.

Materyal ve Method: 2011 -2013 yılları arasında kliniğimizde primer açık açılı glokom nedeniyle opera edilmiş 17 ve tıbbi tedavi gören 21 hasta dahil edildi. Rutin oftalmolojik muayeneleri ve ön kamara açısının değerlendirilmesi yapıldı. Tüm hastaların başlangıç ve her 3 ayda bir Humphrey 30-2 görme alanı muayeneleri yapıldı. Görme alanları yanında görme alanı değişimlerinin istatistiksel olarak değerlendirilmesi için cihazın glokom ilerleme analizi programı kullanıldı. Hastaların yaşları arasındaki fark t- testi, görme alanındaki kötüleşmelerin karşılaştırılması ise Fisher'in keskin K² testiyle yapıldı. Vizyon ve tansiyonlar her iki grupta karşılaştırılırken unpaired t-test kullanıldı.

Sonuç: Her iki grupta görülen görme alanı kötüleşmelerini gösteren kötüleşme analizleri arasında anlamlı bir fark görülmedi ($p=0.49$, $p>0.05$).

Introduction

Primary open angle glaucoma is one of the leading cause of blindness in the world¹. Our goal in its treatment is to reach a target pressure that will not destruct the optic nerve². Today topical antiglaucomatous therapy is the first choice. If it's not enough to reach the target pressure, surgery is indicated⁴. The most preferred surgery type is trabeculectomy⁴.

Visual field (VF) testing is mandatory in diagnosis and follow up of the disease. Loss of visual functions is directly related with quality of life so we need to know about the VF defects of the patients. In great, randomized controlled studies (EMGT, AGIS and CNTGS) worsening of the field defects in normal ocular tensions had been seen^{5,6,7}. Because of this only monitoring ocular pressure is not enough, we also need visual fields. In glaucoma treatment using static perimeters is mandatory. Kinetic Goldman perimeter is not eligible for detecting early defects. Small defects may be lost between isopters⁸. Detecting an early VF defect is very important in today's glaucoma therapy. The softwares were developed in automated perimeters for this reason. As an example EMGT study was used Humphrey Glaucoma Progression Analysis. In this program if there is a worsening in three test points and repeated in consecutive three tests, it's probably means an advancement in visual field defect.

In our study we used the same program for comparing our medically and surgically regulated open angle glaucoma patients.

Materials and Methods

All the study procedures adhered to the principles outlined in the Declaration of Helsinki for research involving human subjects. An informed consent was taken from all patients. Fourteen woman, 24 man, diagnosed as open angle glaucoma were included the study. Any choroidal, retinal or other optic disk pathologies making visual defect were excluded. Visual acuity, ocular tension measurements, anterior and posterior segment, gonioscopic examinations were made for all patients. VF analysis with Humphrey 30-2 (Humphrey 750 II A, Humphrey Instruments, Zeiss Company) full threshold tests were made and repeated every three months for two years. Back ground illumination was 31.5 asb, stimulus size was III

and pupil size was 3mm. Before analysis, near or far refractive errors are corrected with glasses. After the last test Glaucoma Progression Analysis program of the analyzer is taken for evaluating visual field defect advancement. For calculating the age difference between two groups we used t-test, for visual field worsening Fischers exact K² test for calculating visual acuity and for ocular tension between two groups unpaired t-tests were used.

Results

Seven of the all patients had myopia more than 1D, 2 had more than 1.5 D of hypermetropia. Four of the patients in medical therapy group, had systemic hypertension. They were using ACE inhibitors, calcium channel blocker or both. In medical therapy group, 4 patients were using Timolol Maleate %0.5, 3 Betaxolol HCL, 14 Carteolol HCL %2 plus Latanoprost %0.005. All the surgical group patients were used antiglaucomatous medications before.

Mean age of surgery group was $57,42 \pm 10.2$ and was 61.04 ± 12.6 for medical group, the difference was statistically insignificant ($p=0.86$, $p>0.05$). Mean visual acuity in surgery group was 0.39 ± 0.29 , and in medical group 0.43 ± 0.34 . The difference was insignificant (0.26 , $p>0.05$). At the beginning of the study in surgery group mean intraocular pressure (IOP) was 15.15 ± 4.8 mmHg, in medical group was 16.22 ± 4.01 mmHg; at the end, in surgery group it was 15.17 ± 2.57 mmHg and was 17.1 ± 2.5 mmHg in medical group. The mean intra ocular pressure in surgery group was significantly lower than the other group at the end of the study ($p=0.037$, $p<0.05$).

VF defect advancement was seen in 4 patients in medical and in 3 patients in surgery group but this difference was insignificant ($p=0.49$, $p<0.05$).

Discussion

As it's shown by this and other studies that pressures lower than 21 mmHg, that means statistically normal IOP levels, visual field (VF) progression may also be seen. Mao and co-workers treated primary open angle glaucoma patients with topical medication or laser trabeculectomy and found that in all patients who have IOP greater than 21 mmHg, VF defects

In a study it was shown that systemic hypertension, if it was poorly controlled, could increase the risk of primary open angle glaucoma²⁸, conversely in Grunwald's study²⁹ they compared the ocular blood flow in glaucoma patients with and without systemic hypertension and found that optic nerve blood flow was greater in systemic hypertension group. But both study was pointed out that antihypertensive medicines were decreasing ocular blood flow and nocturnal hypotension may be the reason for this. In our study antihypertensive medicines were being used by four patients in medical therapy group and this may affect their VF results.

As a result we think that long term follow up time and large case series are needed for both groups benefits on VF

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