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Research Article

Implication of Intrinsic Intraocular Risk Factors at Ocular Blood Flow to Primary Glaucoma

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Abstract

Purpose: To assess the implication of intrinsic intraocular risk factors at ocular blood flow (OBF) to primary glaucoma (POAG).

Method: In a retrospective control study included 51 consecutive patients, mean age 50, 5±7, in follow-up 2008-2012 divided in control group (CG) 15 patients without POAG, group A (GRA) 15 patients with POAG, group B (GRB) 21 patients with POAG, 9 of them with disc hemorrhage (DH) and 12 with peripapillary atrophy (PPA). We performed baseline glaucoma examination including monitoring pulsatile ocular blood flow (POBFA), pulse amplitude (PA), central corneal thickness (CCT), OCT and visual field (VF) examination. Exclusion criteria: Previous ocular trauma and surgery, pathologies with evident VD. Paired T-test and linear regressions used for statistical analysis.

Results: Our findings indicated a strong correlation between OBFA, IOP and an interrelation between POAG and intrinsic risk factors, DH and PPA (P=0,001). In GRB versus CG,GRA POBF were very sensible and fluctuated depending on the intraocular VD.CCT and IOP changes (P=0,002), showed the abnormality auto regulation(r=0,650). In GRB the POBF and PA were lower ≥8% than other subgroups (P<0,001). LATANOPROST with IOP reduction from baseline 30, 8%, POBF improved 16,6%, PA 10% was the best therapy in GRA. In GRB the switch therapy DORZOLAMIDE + LATANOPROST, DORZOLAMIDE + BIMATOPROST IOP reduction 33.0% from baseline, POBF improved 36%, PA 22%, with added therapy NILVADIPIN 60 mgr + GINKGO BILOBA 150 mg, VISIONACE plus the hemodynamic parameters further improved ≥5%.

Keywords: Vascular Dysregulation; pulsatile ocular blood flow; Pulse Amplitude; Factor Risk , Disc Hemorrhage; Peripapillary Atrophy; Primary Glaucoma; Hemodynamic Parameters; Selective Therapy.

Abbreviations: VDR: Vascular Dysregulation; POAG: Primary Glaucoma; POBF: Pusatile Ocular Blood Flow; PA: Pulse Amplitude; DH: Disc Hemorrhage; PPA: Peripapillary Atrophy; CCT: Central Corneal Thickness; VF: Visual Field

Introduction

Glaucoma is multifactorial disease [1-3]. Investigations of vascular theory in Glaucoma, changed the treatment strategy [4,5]. Vascular dysregulation (VDR) as a systemic dysfunction develop more efficient treatment approach [4,6] compound by extra ocular and intraocular factors [6,7]. DH and PPA are intrinsic important expressions of VDR [8].

Purpose: To assess the implication of intrinsic intraocular risk factors at ocular blood flow (OBF) to primary glaucoma (POAG) patients evaluating medical strategy.

Method

In a retrospective control study included 51 consecutive patients, mean age 50, 5±7, in follow-up 2008-2012 divided in control group (CG) 15 patients without POAG, group A(GRA) 15 patients with POAG , no significant vascular dysregulation(VDR) factor , group B (GRB) 21 patients with POAG, 9 of them with disc hemorrhage (DH), identified supratemporal in 5 cases, infratemporal 4 cases, and 12 with peripapillary atrophy (PPA) was measured in three sectors around the disc circumference 1-5 o'clock . We performed standardized protocol of baseline glaucoma

examination including monitoring pulsatile ocular blood flow (POBFA), pulse amplitude (PA), central corneal thickness (CCT), OCT, and visual field (VF) examination. Exclusion criteria: Previous ocular trauma and surgery, pathologies with evident VD. Paired T-test and linear regressions used for statistical analysis.

Results

Our findings indicated a strong correlation between OBFA, IOP and an interrelation between POAG and intrinsic risk factors, DH and PPA (P=0,001). In GRB versus CG,GRA POBF were very sensible and fluctuated depending on the intraocular VD.CCT and IOP changes (P=0, 002), showed the abnormality auto regulation(r=0,650). GRB showed a mean decrease of OBF=26, 5%, PA=28, 5% from control group and OBF and PA were lower ≥10% than GRA (P<0,001), explained by correlated vascular risk factors. OCT shows a significant difference between CG and eyes with PPA (p=0, 0005), which remained unchanged. LATANOPROST with IOP reduction from baseline 30, 8%, POBF improved 16, 6%, PA 10% was the best therapy in GRA. In GRB the switch therapy DORZOLAMIDE + LATANOPROST, DORZOLAMIDE + BIMATOPROST IOP reduction 33.0% from baseline, POBF improved 36%, PA 22%, with added therapy NILVADIPIN 60 mgr + GINKGO BILOBA 150 mg, VISIONACE plus the hemodynamic parameters further improved ≥10%.

Discussion

These findings indicated a multifactorial VDR not only "extrinsic" but also intrinsic [9,10]. DH, PPA must be considered risk factor of glaucoma progression [9]. DH theorized that they are as result of a micro vascular occlusion of the disc blood supply or by optic nerve neurodegenerative [11,12]. PPA describes as atrophy or thinning of retinal layers and retinal pigment epithelium [2,13]. In GRB the circadian fluctuations of OBF with PA reduction are significant predictor of glaucoma progression, reflected to VF and OCT. Our selective therapy is to get IOP as low as possible with important OBF improved [14-16].

Conclusion

DH and PPA must be considered risk factor of glaucoma progression and intrinsic important expressions of VDR. Ocular hemodynamic parameters are compromised by DH and PPA in glaucomatous eyes. Fluctuations of OBF and PA reduction are indices of vascular dysregulations. Careful observations and multimodal therapy are necessary [10,13,15].

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