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Vascular endothelial growth factor in aqueous humor of patients with proliferative and no proliferative diabetic retinopathy

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Purpose: To measure Vascular Endothelial Growth Factor in both serum and aqueous of patients suffering from non proliferative and proliferative diabetic retinopathy.

Patients and Methods: 70 patients were included in this prospective non randomized non intervention study. The patients were divided into 3 groups: Group (A): 25 eyes of patients diagnosed with proliferative diabetic retinopathy. Group (B): 25 eyes with non proliferative diabetic retinopathy. Group (C): 20 control eyes in non diabetic patients. To be able to take an aqueous sample all patients were diagnosed with surgically indicated cataract. Aqueous humor sample collection was done for all groups before they underwent their cataract extraction surgery. Patients with previous intra vitreal injection were excluded. Collection of 0.1 - 0.2 ml aqueous humor fluid was conducted in the operating theater just prior to intraocular surgery by way of limbal anterior chamber puncture. Serum samples were collected prior to cataract surgery, for measuring serum, HDL, LDL, Fasting blood glucose, HbA1c and ESR levels. ELISA was used for VEGF concentration in samples. Statistical methods included mean value, Pearson correlations/ p-value, linear regression, and ROC curve analysis

Results: Mean Age was 56.7 ± 7.12 y. Mean values of both aqueous VEGF were 340.6 ± 31.9 , 226.8 ± 20.3 , and 61.55 ± 10.14 (p: 0.0001 compared to controls) for group A, B, and C respectively. Group B had significantly less number of PDR patients (p: 0.0001) of diabetic proliferative retinopathy (PDR) than the other two groups. In group (B) the variation of aqueous VEGF concentration was strongly related to the severity of DM. Seven patients of this group had aqueous VEGF ≥ 226 pg (226-260 pg), those patients had cystoid macular edema. The variation of serum VEGF concentration and its relation with aqueous concentration were analyzed and was strongly related to the severity of DM.

Conclusion: The aqueous levels of VEGF were significantly elevated in eyes with PDR compared to normal. and also to NPDR without clinically significant diabetic macular edema. These results emphasize the probability that VEGF elevation is induced by retinal ischemia and plays a major role in the development and progression of PDR.NPDR without clinically significant diabetic macular edema eyes had aqueous VEGF levels (albeit high) closer to those of normal control eyes.

Recent publications:

1. The Effect of Vitrectomy Infusion Solutions on Postoperative Electroretinography and Retina Histology Hisham Abdel Dayem, Michael Hartzler, George Williams, Philip Ferrone. BMJ Open Ophthalmology, April 03 2017; DOI: 10.1136/bmjophth-2016-000004
2. Optical Coherence Tomography Assessment of Macular and Choroidal Thickness in Patients with Proliferative Diabetic Retinopathy in Relation to HbA1C. Reem Mostafa Mohamed, Alaa Fathy Mahmoud, Hisham MK Abdel Dayem, Wael Adel Gomaa; Ms Thesis, Faculty of Medicine, Ain Shams University Library; 2017.
3. Multi-drug resistant proteins expression in primary enucleated retinoblastoma eyes versus surgery after conservative treatment

Biography

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