RETINAL ULTRASTRUCTURAL, ELECTROPHYSIOLOGICAL AND MICROVASCULAR MORPHOLOGICAL OUTCOMES IN DIABETIC MACULAR EDEMA TREATED WITH INTRAVITREAL BEVACIZUMAB

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Purpose: To investigate retinal ultrastructural, electrophysiological, and microvascular morphological changes, as well as correlations between these changes and visual outcome in naïve diabetic macular edema (DME) patients after intravitreal bevacizumab therapy

Design: A prospective interventional study

Methods: A total of 31 DME patients' eyes had monthly intravitreal bevacizumab injections for three consecutive months. Best-corrected visual acuity (BCVA) and intraocular pressure (IOP) were measured, and fundus fluorescein angiography, optical coherence tomography (OCT), microperimetry (MP), as well as optical coherence tomography angiography (OCTA) were performed before and after therapy. Patients were then grouped based on BCVA improvement after three consecutive intravitreal injections: group 1- >10 letters, group 2- ≤5 letters, and group 3- between 6 and 10 letters.

Results: Mean BCVA increased significantly after therapy, rising from 34.2 to 39.9 letters ($p<0.001$). The central macular thickness (CMT) decreased significantly from baseline 335.1 μm to 276.4 μm ($p<0.001$). Fixation stability, mean retinal sensitivity, and mean local deficit all improved significantly after therapy ($p<0.001$ for all). There was no statistically significant change in IOP before and after therapy ($p=0.665$). While OCTA parameters did not change significantly, patients with lower foveal avascular zone area, higher FD-300 and deep plexus vascular density showed better improvements in mean BCVA, retinal sensitivity, and local defect. Also, there were no significant intergroup differences in gender, age, baseline BCVA, HbA1c, IOP, phakic/pseudophakic lens ratio, presence of concomitant hypertension, and superficial capillary plexus vascular density.

Conclusions: Intravitreal bevacizumab therapy was associated with significantly improved BCVA, retinal ultrastructural integrity, and electrophysiological patterns in naive DME patients. Improvements in retinal electrophysiology correlated with ultrastructural improvements, which could be predicted using OCTA.