

Abstract 139

ASSESSMENT OF PRO-INFLAMMATORY OCT BIOMARKERS IN REFRACTORY DIABETIC MACULAR OEDEMA

Marko L.*, Ian Y., Sagnik S.

Moorfields Eye Hospital NHS Foundation Trust ~ London ~ United Kingdom

This study evaluates optical coherence tomography (OCT) pro-inflammatory biomarkers in treatment-naïve patients who display a suboptimal response to anti-VEGF therapy during the loading phase and monitors the evolution of OCT biomarkers over a 24-month treatment period. This is a retrospective analysis of clinical data collected at Moorfields Eye Hospital NHS Foundation Trust, London, UK.

This study constitutes a real-life retrospective analysis of patients' records and images from 2017 to the beginning of 2020. The cohort comprises exclusively intravitreal injection-naïve eyes eligible for intravitreal anti-VEGF treatment for diabetic macular edema (DMO) at Moorfields Eye Hospital NHS Foundation Trust in 2017. Statistical analysis was restricted to patients who underwent five monthly loading doses of intravitreal anti-VEGF injections and exhibited a suboptimal response to the treatment. The suboptimal response is defined as a reduction in central foveal thickness (CFT) of less than 20% compared to baseline, with an improvement in baseline visual acuity of fewer than 5 ETDRS letters by the time of the 5th monthly intravitreal anti-VEGF injection. Among these patients, specific focus will be placed on those whose baseline visual acuity was equal to or less than 70 ETDRS letters. The follow-up period commences at the time of the initial intravitreal injection and extends over 24 months. Each patient's assessment includes analysis of best-corrected visual acuity (BCVA), central foveal thickness (CFT), and OCT pro-inflammatory biomarkers at baseline, at the 5th monthly intravitreal anti-VEGF injection, and at 12 and 24 months. Key OCT biomarkers of interest encompass intraretinal hyperreflective foci and subfoveal neuroretinal detachment. A single 180° SD-OCT line scan (6 mm length) centered on the fovea was analyzed for each patient. All OCT scans underwent manual analysis and assessment by a single retina specialist. The statistical analysis assessing VA, CFT, and HF alterations was conducted utilizing a One-Way Analysis of Variance (ANOVA), with statistical significance established at a p-value below 0.05. We calculated Pearson's correlation coefficient between CFT and HF.

We identified 37 eyes out of 37 patients who met the inclusion criteria of suboptimal response at the time of the 5th loading intravitreal injection. All eyes included started treatment with intravitreal anti-VEGF injections, and the mean number [range] of anti-VEGF injections over the follow-up period of 24 months was 13.18 [8-26]. Baseline assessments revealed a mean VA(SD) of 59.1 ± 13 ETDRS letters and a mean CFT(SD) of 430 ± 91 μ m. At the time of the fifth intravitreal anti-VEGF injection, the mean VA(SD) was 64.5 ± 13 ETDRS letters, and the mean CFT(SD) was 390 ± 91 μ m, with p-values of 0.362 and 0.312, respectively. At the end of the 24-month follow-up, the mean (SD) VA was 67 ± 15 ETDRS letters, and the mean CFT(SD) was 297 ± 90 μ m ($p > 0.05$ and $p = 0.0000$, respectively).

The mean (SD) number of hyperreflective foci at baseline was 7.23 ± 7 . The mean (SD) number of HF at the end of the loading phase was 4.56 ± 7 ($p = 0.225$). The One-Way ANOVA analysis showed no significant decrease in HF over two years of follow-up. However, the post hoc Tukey HSD showed a significant difference in the number of HF between 12 and 24 months of follow-up ($p = 0.000$). Three eyes presented with subfoveal neuroretinal detachment at baseline, while two eyes developed the SND during the follow-up period. Pearson correlation coefficient between hyperreflective foci and

central foveal thickness was positive at all time points but weak at baseline, 12 months, and 24 months ($r = 0.3914$, 0.4779 , and 0.1924 , respectively). At the time of the 5th injection, the correlation between CFT and HF was positive and moderate ($r = 0.5564$).

Our study may suggest that OCT scans of DMO patients who suboptimally respond to anti-VEGF therapy indicate the continuous presence of hyperreflective foci, thus signaling the pro-inflammatory component of oedema.