Correlation of Best Corrected Visual Acuity and Central Subfield Thickness in Macular Edema Due to Retinal Vein Occlusion, Diabetic Retinopathy and Uveitis

Michael Ip, M.D.
CA

Thomas A Ciulla, M.D., M.B.A.

Purpose:

Given the clinical importance of best corrected visual acuity (BCVA) measured as a visual acuity letter score (VALS) and macular edema (ME) quantitated from OCT central subfield thickness (CST), this study assessed the relationship between VALS and CST in ME due to retinal vein occlusion (RVO), diabetic macular edema (DME) and noninfectious uveitis (NIU).

Methods:

Eyes with ME due to RVO, DME, or NIU were analyzed to assess the relationship between VALS and CST in ME across disease state, in 6 clinical trials, with monitor-verified diagnoses per eligibility criteria, Early Treatment Diabetic Retinopathy Study (ETDRS) protocol refractions and OCT reading center evaluation. Patients were assessed at monthly intervals up to 6 months, irrespective of randomization to the active or control arm of the clinical trial. The clinical trials for each of the disorders were analyzed separately and analyzed pooled by disorder. Correlation and univariate regression analyses were performed to assess relationships between VALS and CST.

Results:

This analysis included 1,063 eyes with ME due to RVO (774 eyes), DME (91 eyes) and NIU (198 eyes). With respect to baseline VALS and CST, Pearson Correlation Coefficients were: ME due to RVO -0.56 (95% CI -0.61 to -0.51, P <0.001), DME -0.50 (95% CI -0.64 to -0.33, P <0.001), and ME due to NIU -0.38 (95% CI -0.49 to -0.26, P <0.001). When correlating change from baseline to 6 months for both VALS and CST, Pearson Correlation Coefficients were: ME due to RVO -0.35 (95% CI -0.43 to -0.27, P <0.001), DME -0.30 (95% CI -0.48 to -0.09, P =0.006), and ME due to NIU -0.42 (95% CI -0.53 to -0.29, P <0.001).

Conclusions:

At baseline, there were significant moderate negative linear correlations between BCVA and CST in subjects with ME due to RVO, DME and NIU, but CST accounted for less than one third of the total variation in BCVA. For change from baseline to 6 months, there were also significant but lower negative linear correlations between BCVA and CST across these disease states, compared to baseline correlations. However, change in CST accounted for a minority of the total variation in change in BCVA.