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TITLE: A Conversion Model for OCTA Vessel Density Metrics in Diabetic Eyes: AngioVue vs Angioplex

SESSION TITLE: OCT Angiography Clinical Applications

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ABSTRACT BODY:

Purpose: To understand measurements variability between 2 different OCTA devices and to develop a conversion model that translate vascular metrics into a standardized and comparable value in patients with different stages of DR.

Methods: A cross-sectional study was conducted in 55 patients (n=108 eyes) with diabetes type 2 (68.1±9.3yrs), 37(67%) were males.

Each eye underwent 3x3mm OCTA scans in AngioVue (Optovue RTVue,Optovue Inc) followed by 3x3mm OCTA scans in Angioplex (Cirrus HD-OCT 5000,Zeiss Meditec Inc) both centred on fovea. The Foveal Avascular Zone(FAZ) area and perimeter and the binarized Vessel Density(bVD) in the Central area, Inner Ring (3mm ø centred on fovea) and full 3mm^2 area were collected from the Superficial Capillary plexus(SCP) images of both equipments. Agreement between AngioVue and Angioplex measurements was assessed by Intraclass Correlation Coefficient(ICC) and Bland-Altman plots. A conversion equation was established to transform bVD values from Angiovue in Angioplex-equivalent values. This equation was built using repeated-measures models with generalized estimating equations to account for the correlation in participants with 2 study eyes, with Angioplex measurement as the dependent variable and AngioVue measurement as the independent variable.

Results: Binarized VD values measured by AngioVue were significantly higher than those by Angioplex (inner ring: 42.9±4.8vs35.6±3.3; $p<0.001$). However, a good ICC between both equipments was found for FAZ metrics (0.66 (0.52-0.77) for area and 0.59 (0.45–0.70) for perimeter), showing a good agreement of these metrics independently of the device.

Regarding the conversion model between devices, the following equation was derived: Angioplex bVD=(Angiovue bVD x 0.45) + 16.3. With this equation,84% of the Angioplex-equivalent bVD values fell within 10% of the real measurements using Angioplex. The obtained difference between converted and real values of bVD was <7.21.

Conclusions: Despite the use of distinct algorithms to detect binarized retina VD between different OCTA equipments, we propose a conversion model to obtain comparable bVD measurements between AngioVue and Angioplex devices in diabetic eyes with distinct levels of severity. This conversion model opens important possibilities for clinical trials to pool data from different OCTA instruments, allowing comparison of results within and between groups that are using distinct instruments.