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### *Comparison of the Distribution of Different Sized Vessels in Ocular Surface Images of Diabetic and Normal Individuals.*

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- **Purpose:** To compare the distribution of different sized vessels in the digital photographs of eyes of normal individuals and diabetic patients.
- **Methods:** In a cross sectional case control study conjunctival photographs were taken from upper and lower conjunctival areas of the two eyes of diabetic patients and normal controls in the same age range. All participants underwent complete ophthalmic examination. A previously described radon transform based algorithm was used for vascular segmentation and calculation of the Area of image Occupied by Vessels of different sizes (AOV).
- **Results:** Three hundred thirty four diabetic patients and 343 normal individuals were recruited. 268 diabetic patients and 279 normal individuals had good quality photos for analysis. Patients and controls differed with respect to age (45.40± 5.19 vs. 41.69± 6.95, p=0.000), systolic (126.4±19.9 vs. 120±14.8, p=0.000) and diastolic (77.8±14.1 vs. 70.1±12.2, p=0.000) blood pressure, and hematocrit (40±4 vs. 41.1 ±2.8, p=0.011). There was no difference in terms of sex, height, weight and BMI and hemoglobin levels between the 2 groups. AOV of small vessels less than 11 pixels were larger in diabetics than in controls. AOV of the vessels with 12-13 pixel width did not differ between the two groups. AOV of vessels from 14 to 52 pixels were significantly larger in controls than in diabetics. Results were similar in the 4 areas of conjunctivae studied. Mean AOV of vessels in each area did not correlate with the stage of diabetic retinopathy.
- **Conclusion:** Distribution of different sized conjunctival vessels differs between normal individuals and diabetic patients. Small vessels occupy a larger proportion of the image in diabetic eyes, and medium sized and large vessels occupy more of the image in normal individuals than in diabetics.