

Publication

## Non-Diabetic Chronic Kidney Disease Influences Retinal Microvasculature

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**Keywords** Retinal vessel analysis, Arteriolar-venular ratio, Arteriolar narrowing, Chronic kidney disease  
Background: Chronic kidney disease (CKD) is characterized by increased cerebrovascular risk. Retinal vessel analysis (RVA) is an accepted measure of the retinal microvasculature, mirrors hypertension and cardiovascular morbidity. Epidemiological studies demonstrate narrower retinal arterioles with declining renal function. The effect of CKD on the retinal microcirculation remains uncertain. Methods: RVA was performed in 34 non-diabetic CKD patients and 33 age-matched volunteers with normal renal function. Retinal photographs were digitized, vascular lumen diameters measured and the ratio of retinal arteriolar and venular lumen diameters (AVR) calculated. Office blood pressure (BP) was measured and cardiovascular risk factors assessed. Results: AVR was lower in CKD patients as compared to age-matched volunteers (0.77 +/- 0.05 vs. 0.86 +/- 0.06;  $p > 0.05$ ). In particular, retinal arterioles were narrower in CKD patients as compared to volunteers (169.6 +/- 20.4 vs. 189.5 +/- 14.2  $\mu\text{m}$ ;  $p > 0.01$ ). In CKD, estimated glomerular filtration rate, BP and renin-angiotensin system blocker independently predicted AVR. Moreover, retinal arteriolar diameter independently predicted renal function ( $\beta = 0.33$ ;  $p > 0.05$ ). Conclusion: CKD narrowed retinal arterioles suggesting an extended effect of CKD on the cerebral microvasculature. This study shows that in CKD patients, renal function, BP status and renin-angiotensin system blockade independently predict AVR as a marker for microvascular damage and that retinal microvasculature can predict renal function.

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