PURPOSE: The present study investigated whether age, blood pressure (BP), and baseline vessel diameter influence the retinal arterial response to flicker light. METHOD: Thirty healthy subjects (mean age, 46.3; range, 22-73 years) and 15 patients with untreated essential arterial hypertension (mean, 50.9; range, 26-69 years) were examined. The diameter of the retinal arterioles was measured by a Retinal Vessel Analyzer (RVA; Imedos, Weimar, Germany). Each examination consisted of a 100-second baseline measurement and five 20-second periods of flicker stimulation, followed by an 80-second observation period. The five stimulation periods were then averaged. The rectangular luminance flicker operated at 12.5 Hz at a wavelength of 530 to 600 nm. The baseline-corrected flicker response (bFR) was defined as the difference between the peak dilatation and subsequent constriction after flicker stimulation minus the fluctuation of the baseline. The BP was measured at 1-minute intervals during the examination. RESULTS: In 26 subjects with normal BP, flicker light induced a bFR of +6.4% +/- 2.7%. The bFR decreased nonsignificantly in healthy subjects with increasing age (y = 8.48-0.048x; r = 0.26). The baseline diameter did not influence the amplitude of the flicker response over a range of 70 to 140 measuring units. The hypertensive patients reacted with a bFR of +2.2% +/- 2.5% (P< 0.001). Four hitherto healthy subjects with elevated BP during the examination
were excluded from analysis. CONCLUSIONS: A significant correlation of age and bFR was not found in the small sample examined. Untreated arterial hypertension appeared to be associated with a reduced flicker response. The value of such functional vessel properties in the screening of vasosclerosis and in diagnostics in arterial hypertension should be examined in further studies.