Variability and repeatability of quantitative, fourier-domain optical coherence tomography doppler blood flow in young and elderly healthy subjects

Abstract

The purpose of this study was to determine the within-session variability and between-session repeatability of spectral domain optical coherence tomography (OCT) Doppler measurements. OCT Doppler blood flow measurement of young and elderly subjects.

Methods. Doppler OCT blood flow was measured using the RTVue system. One eye of each of 26 healthy young (14.7 ± 2.7 years) and 16 healthy elderly (64.6 ± 8.1 years) subjects was randomly selected, and the pupil was dilated. The double circular scanning pattern of the RTVue was employed. Six Doppler OCT measurements (i.e., each separate measurement comprising an upper and lower nasal retinal vessel) were acquired at each session. The mean flow was calculated as the average of the flow determined over the three repeated measurements for each subject. The coefficients of variation (CV) and repeatability (COR) were calculated for each individual.

Results. The individual CVs for retinal blood flow for young subjects ranged from 0.4% to 10.4% (median 1.8%) and for the elderly subjects ranged from 1.6% to 21.4% (median 9.2%). The group mean CVs for retinal blood flow for young participants were 1.4 ± 3.1 μL/min (median 1.1 ± 3.1 μL/min, relative to a mean retinal vessel) and for elderly subjects were 10.5 ± 1.0 μL/min (median 9.3 ± 1.0 μL/min, relative to a mean retinal vessel 4.0 μL/min).

Conclusions. Doppler OCT gave consistent and repeatable blood flow measurements within normal vessels in normal subjects. Considering the individual variation in blood flow measurements, confidence limits for retinal hemodynamics needs to be determined on an individual basis. © 2014, the Association for Research in Vision and Ophthalmology, Inc.

Author keywords

Retinal blood flow, Optical coherence tomography, Doppler blood flow, Total retinal blood flow, Repeatability

Indexed keywords

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