

Publication

Effects of acute bouts of endurance exercise on retinal vessel diameters are age and intensity dependent

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 4399340**Author(s)** Nussbaumer, M.; Donath, L.; Fischer, M.; Schäfer, J.; Faude, O.; Zahner, L.; Schmidt-Trucksäss, A.; Hanssen, Henner**Author(s) at UniBasel** [Hanssen, Henner](#) ; [Zahner, Lukas](#) ;**Year** 2014**Title** Effects of acute bouts of endurance exercise on retinal vessel diameters are age and intensity dependent**Journal** AGE**Volume** 36**Number** 3**Pages / Article-Number** 1249-1261**Mesh terms** Adolescent; Adult; Aged; Aged, 80 and over; Aging, physiology; Cross-Over Studies; Female; Follow-Up Studies; Healthy Volunteers; Humans; Male; Microcirculation, physiology; Middle Aged; Physical Endurance, physiology; Prospective Studies; Retinal Vessels, physiology; Vasoconstriction, physiology; Young Adult

Alterations of retinal vessel diameters are associated with increased cardiovascular risk. We aimed to investigate changes in retinal vessel diameters in response to acute dynamic exercise of different intensities and whether these changes are age dependent. Seventeen healthy seniors (median (IQR) age 68 (65, 69) years) and 15 healthy young adults (median (IQR) age 26 (25, 28) years) first performed a maximal treadmill test (MTT) followed by a submaximal treadmill test (SMTT) and a resting control condition in randomised order. Central retinal arteriolar (CRAE) and central retinal venular (CRVE) diameter equivalents were measured before as well as 5 (t5) and 40 (t40) minutes after exercise cessation using a static retinal vessel analyser. Both exercise intensities induced a significant dilatation in CRAE and CRVE at t5 compared to the control condition ($P < 0.001$). At t40, the mean increase in CRAE and CRVE was greater for MTT compared to that for SMTT (CRAE $1.7 \mu\text{m}$ (95 % confidence interval (CI) -0.1, 3.6; $P = 0.061$); CRVE $2.2 \mu\text{m}$ (95 % CI 0.4, 4.1; $P = 0.019$)). However, the estimated difference at t5 between seniors and young adults in their response to MTT compared to SMTT was $5.3 \mu\text{m}$ (95 % CI 2.0, 8.5; $P = 0.002$) for CRAE and $4.1 \mu\text{m}$ (95 % CI -0.4, 8.6; $P = 0.076$) for CRVE. Wider arteries and veins after maximal versus submaximal exercise for seniors compared to young adults suggest that myogenic vasoconstriction in response to exhaustive exercise may be reduced in seniors. Age-related loss of vascular reactivity has clinical implications since the arteriolar vasoconstriction protects the retinal capillary bed from intraluminal pressure peaks.

Publisher Springer Verlag**ISSN/ISBN** 0161-9152 ; 1574-4647**URL** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4082577/>**edoc-URL** <https://edoc.unibas.ch/62268/>**Full Text on edoc** No;**Digital Object Identifier DOI** 10.1007/s11357-014-9650-3**PubMed ID** <http://www.ncbi.nlm.nih.gov/pubmed/24728623>**ISI-Number** WOS:000342142300019**Document type (ISI)** Article