

BLOOD PERFUSION MRI RESPONSES OF THE HUMAN CHOROID TO MYOPIC RETINAL DEFOCUS 4342



SAFAL KHANAL, PHILIP R.K. TURNBULL, EHSAN VAGHEFI, JOHN R. PHILLIPS

AUCKLAND MYOPIA LABORATORY, SCHOOL OF OPTOMETRY AND VISION SCIENCE

THE UNIVERSITY OF AUCKLAND, NEW ZEALAND



INTRODUCTION

- The choroid can rapidly change its thickness in response to retinal image defocus, but the underlying mechanism is unclear.
- One proposed mechanism is via changes in choroidal blood perfusion.

PURPOSE

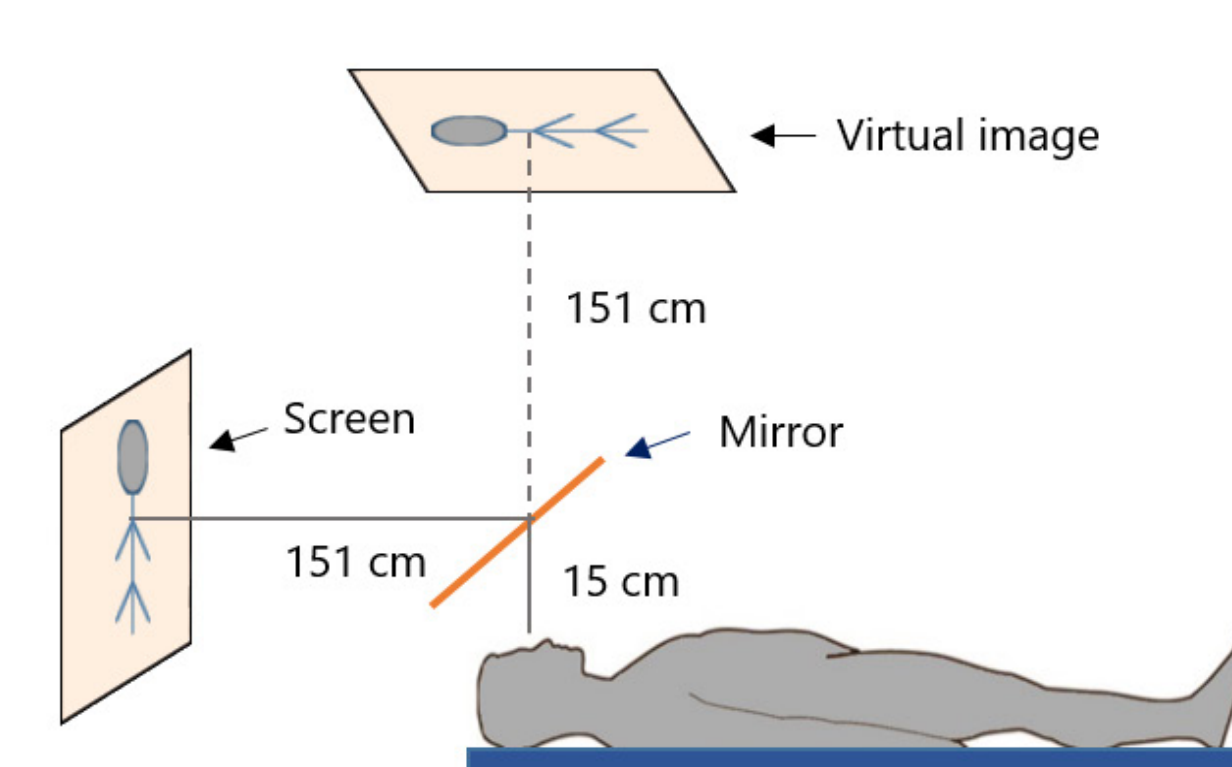
- To quantify the effect of short-term induced myopic defocus on blood perfusion in the human choroid using arterial spin labeling (ASL) MRI.

METHODS

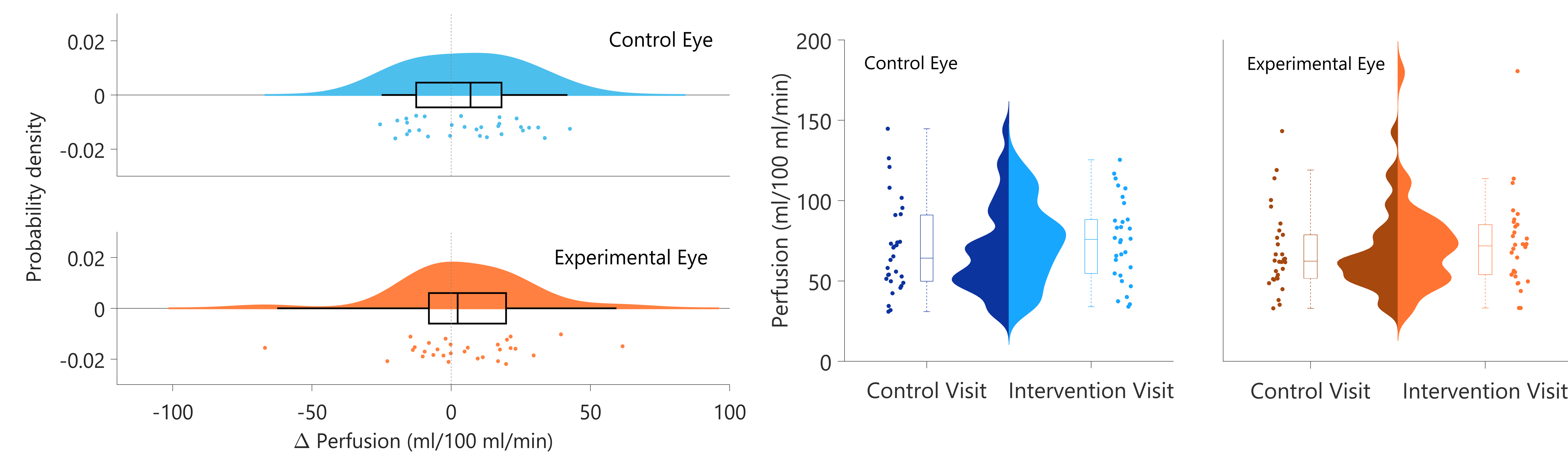
- 30 young healthy adults (12 male, age: 25 ± 4 years) were scanned by 3T SKYRA MRI in two randomised visits (within a week).
- Intervention visit: Randomly selected experimental eye received +2.00D myopic defocus, while the fellow control eye received no defocus.

Control visit: Both eyes were optimally corrected for the viewing distance.

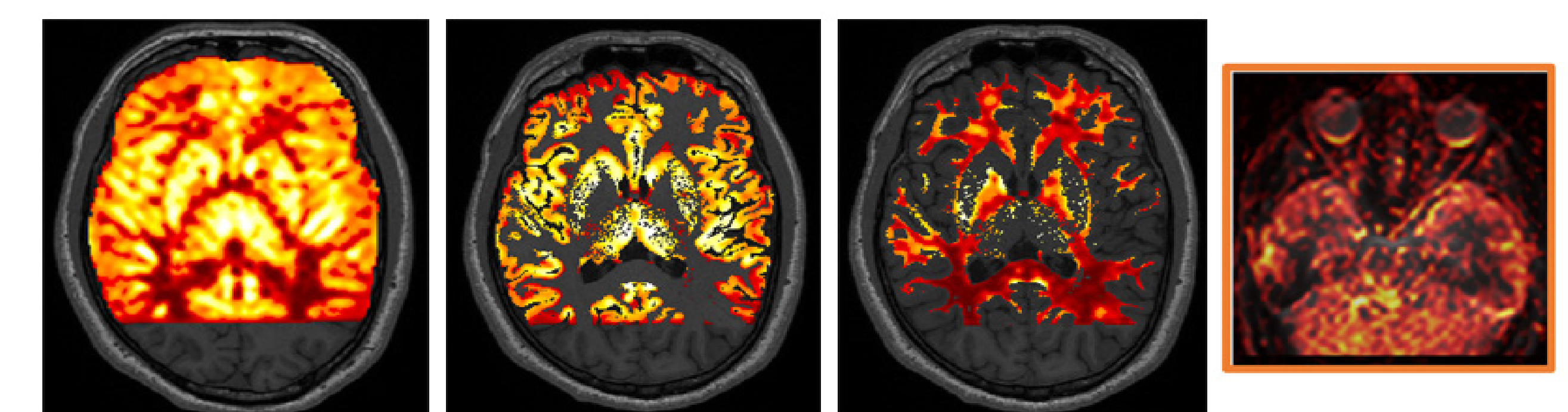
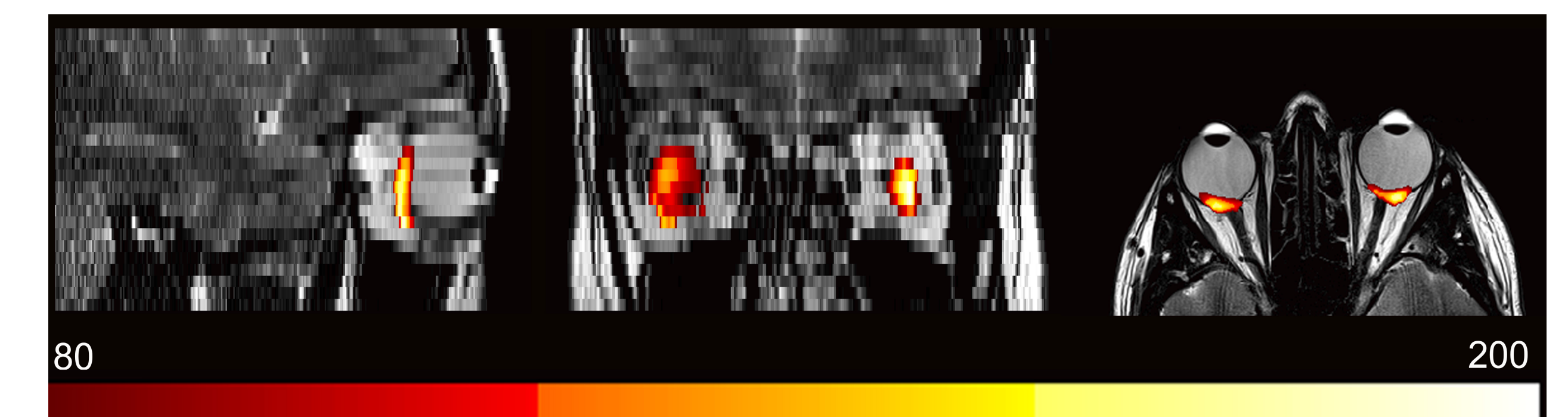
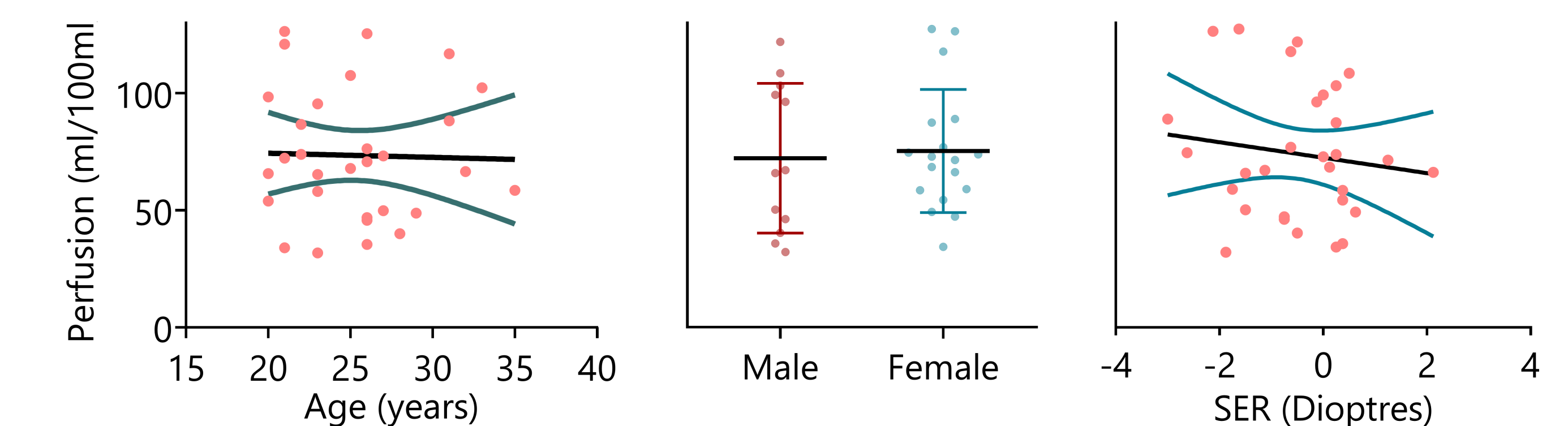
- Subjects had to watch a video for 40 minutes in a supine position prior to the MRI scans.
- Choroidal blood perfusion was imaged using a 3D pseudo-continuous ASL technique with turbo-gradient-spin-echo acquisition and background suppression.
- MRI images were processed and analysed using Functional MRI of the Brain Software Library tools and MATLAB.



RESULTS



- Baseline measures of perfusion under no imposed defocus were not significantly different between the control and the experimental eye (median, 64.2 vs 62.3 ml/100ml/min, median difference (MD) = 0.05, Wilcoxon $p = 0.95$).
- No significant changes in perfusion were observed for the control eye (MD = -6.95, $p = 0.15$).
- The experimental eye (MD = -2.32, $p = 0.20$) also showed no significant changes in choroidal perfusion between the intervention and control visits.
- Changes in perfusion between the visits were also not different between the control and the experimental eye (MD = -1.69, $p = 0.69$).



Whole brain Grey matter White matter

CONCLUSION

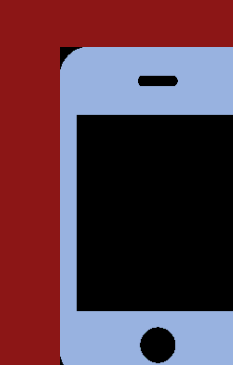
- ASL-MRI provides a feasibility to obtain quantitative reliable measures of choroidal perfusion *in vivo*.
- Choroidal perfusion measures as obtained with the ASL-MRI technique are repeatable.
- Short-term imposed myopic defocus does not affect choroidal perfusion.
- Changes in blood perfusion may not underlie defocus-induced thickness alterations in the choroid.
- Further investigations on one or more of the fluid redistribution mechanisms could provide insights into how the choroid modulates its thickness in response to retinal image defocus.

Acknowledgements:

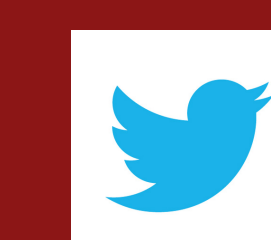
CooperVision Inc., New Zealand Optometric Vision Research Foundation, and Rober F. Kinnear

Disclosures: None

Changes in choroidal blood perfusion do not mediate choroidal thickness responses to retinal image defocus



Take a picture for technical details



@SafTalks



s.khanal@auckland.ac.nz