**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).

**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.

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