

# Optic nerve head and macula perfusion in diabetics after anti-VEGF injection



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Poster # 3076-A0419

## BACKGROUND

- Glaucoma studies have shown that patients with elevated intraocular pressure (IOP) have poor optic nerve perfusion.
- Lee [BMC 2016] showed IOP increases after anti-VEGF injection can result in decrease of mean ocular perfusion pressure.
- The purpose of this study is to quantitatively evaluate the perfusion of the optic nerve and macula in response to Anti-VEGF injection in diabetics using OCT angiography.

## METHODS

- Patients with diabetes and age-matched normals were imaged with the optic nerve head (ONH) 4.5mm x 4.5mm and macula 3mm x 3mm angiography scans using ZEISS AngioPlex<sup>®</sup> OCT Angiography (ZEISS, Dublin, CA).
- Tonopen<sup>®</sup> AVIA (Reichert, Depew, NY) was used to measure baseline IOP. Post injection IOP, ONH scan and macula scan were performed at 1 minute, 10 minutes, and 20 minutes.
- Angiography metrics measured perfusion with CIRRUS 11.0 software at each time point.
- Each diabetic patient's baseline perfusion was compared with a normal subject.

## CONCLUSION

- Diabetics have a less perfused macula and a similarly perfused optic nerve compared to normal eyes at baseline.
- IOP increased in all patients post-injection while macula and optic nerve perfusion decreased. The perfusion change in the macula was significant whereas the change in the nerve was not.
- After 20 minutes, measured parameters tended to return near baseline.
- AngioPlex OCTA demonstrates the transient effect on perfusion in diabetics in response to intravitreal injection.

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Disclosures: KM (E), CW (C), MD (E), SR (C): Carl Zeiss Meditec, Inc

## RESULTS

Figures 1 & 2 show macular and optic nerve perfusion of normal and diseased patients. On average, at baseline, the macula perfusion of 15 diabetic eyes (Age:57 +/- 14) was 13.5% less perfused (p=0.0002) than 15 normal eyes (Age: 53+/- 12) and the optic nerve was 3% less perfused (p=0.06) than 15 normal eyes (Age: 55 +/- 12). Post injection, average IOP increased 114% (p=0.0002) while macular perfusion decreased 7.5% (p=0.01) and optic nerve head perfusion decreased 2% (p=0.06). Figure 3 shows the IOP fluctuations of the injected diseased patients

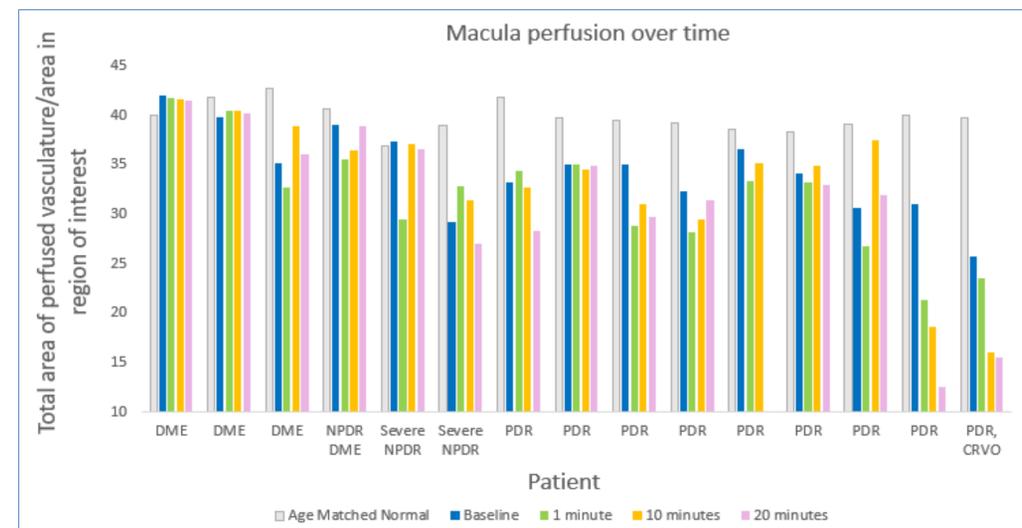


Figure 1.

Macula perfusion of age-matched normal eyes in comparison to diseased eyes at baseline. In addition, the perfusion of the diseased eyes at 1 minute, 10 minutes and 20 minutes post Anti-VEGF injection.

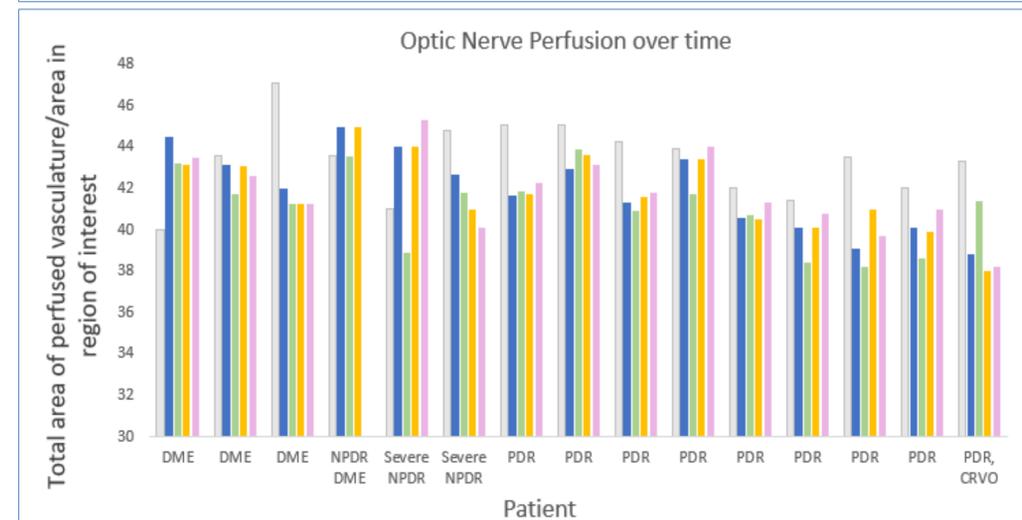


Figure 2.

Optic nerve perfusion of age-matched normal eyes in comparison to diseased eyes at baseline. In addition, the perfusion of the diseased eyes at 1 minute, 10 minutes and 20 minutes post Anti-VEGF injection.

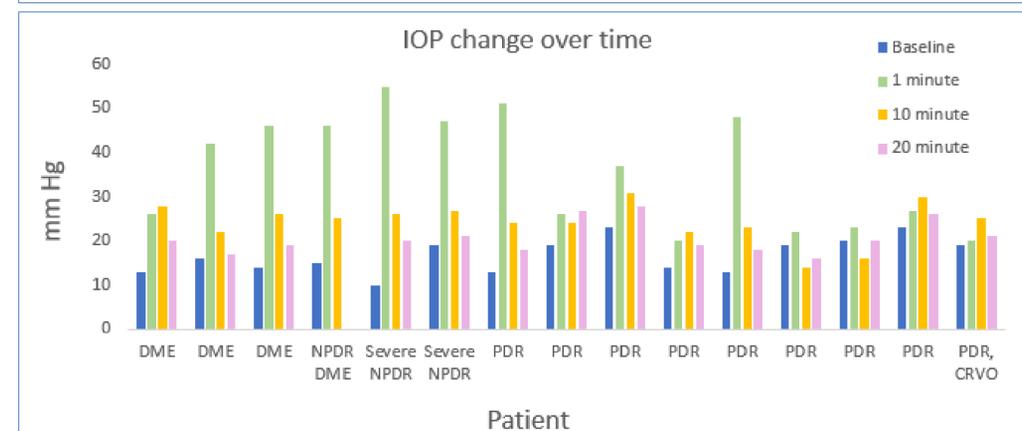


Figure 3.

Intraocular pressure at baseline, 1 minute, 10 minutes, and 20 minutes post injection in the diseased eyes.