Retinal vessel oxygen saturation and its correlation with structural changes in retinitis pigmentosa

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PURPOSE
To study the influence of retinal structural changes on oxygen saturation in retinitis pigmentosa (RP) patients.

METHODS
Oximetry measurements were performed on 21 eyes of 11 RP patients and compared to 24 eyes of 12 controls. Retinal oxygen saturation was measured in all major retinal arterioles (A-SO) and venules (V-SO) with an oximetry unit of the retinal vessel analyser (IMEDOS Systems UG, Jena, Germany). Oximetry data were compared with morphological changes measured by Cirrus optical coherence tomography (OCT) (Carl Zeiss Meditec, Dublin, CA, USA, macular thickness protocol).

RESULTS
In RP patients, the retinal A-SO and V-SO levels were higher at 99.3% (p = 0.001, anova based on mixed-effects model) and 66.8% (p < 0.001), respectively, and the difference between the two (A-V SO) was lower at 32.5% (p < 0.001), when compared to the control group (92.4%; 54.0%; 38.4%, respectively). With the RP group, the A-V SO correlated positively, not only with central macular thickness, but also with retinal thickness, in zones 2 and 3 (p = 0.006, p = 0.007, p = 0.014).

CONCLUSION
These data indicate that oxygen metabolism was altered in RP patients. Based on our preliminary results, retinal vessel saturation correlated with structural alterations in RP. This method could be valuable in monitoring disease progression and evaluating a potential therapeutical response.