Retinal vessel oxygen saturation in patients suffering from inherited diseases of the retina

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PURPOSE
The aim of this study was to evaluate the oxygen saturation in patients with inherited diseases of the retina.

METHODS
Fundus oximetry images were taken using a retinal vessel analyser (IMEDOS Systems UG, Jena, Germany). Retinal vessel oximetry was performed in 53 eyes of 27 patients suffering from inherited retinal diseases and compared to 22 eyes of 11 healthy controls. The oxygen saturation in all four major retinal arterioles (A-SO2) and venules (V-SO2) were measured and their difference (A-V SO2) was calculated. The data were compared within groups and to controls.

RESULTS
Based on V-SO2 values, the rod-cone dystrophy group (66.46%; SD, ± 5.09) could well be differentiated from controls 54.02% (SD, ± 3.04), from cone-rod dystrophies 57.56% (SD, ± 5.66), as well as from inherited maculopathies 58.42% (SD, ± 4.74). The mean A-SO2 in the rod-cone dystrophy group was increased to 98.96% (SD, ± 6.06, p<0.014), while in the cone-rod group and in the maculopathy group it was 92.75% (SD, ± 3.75), respectively 94.44% (SD ± 4.85), closer to the normal values (92.68%; SD, ± 3.53, p>0.05). The A-V SO2 difference, as an indirect indicator for retinal oxygen use, was reduced in the rod-cone patients, however only when the controls were taken into account (p=0.01).

CONCLUSION
This is to our knowledge the first study which proposes the retinal vessel oximetry to be a sensitive measure for differentiating rod-cone dystrophy patients not only from controls, but also from patients with other inherited retinal dystrophies.