

Rapid Recovery Hyperbarics

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[Clin Experiment Ophthalmol.](#) 2006 Aug;34(6):584-9.

Hyperbaric oxygen therapy ameliorates the blood-retinal barrier breakdown in diabetic retinopathy.

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Source

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Abstract

BACKGROUND:

To study the effect of hyperbaric oxygen (HBO) therapy on diabetic retinopathy in a streptozotocin-induced diabetic rat model.

METHODS:

Sprague-Dawley albino male rats were divided into three groups. The three groups were as follow: (i) non-diabetic control group (non-DM control); (ii) diabetic control group (DM control); and (iii) diabetic rats receiving hyperbaric oxygen therapy (DM HBO). Rats in DM HBO group were incubated in an oxygen monoplace chamber. The HBO condition was set at 2.5 atmospheres and 100% oxygen. The duration of a single HBO treatment was 90 min. Rats in DM HBO groups received HBO three times per week for 3 months. Retinal vascular permeability was assessed by measuring fluorescein isothiocyanate-labelled bovine albumin and retinal Evans blue leakage into the retina.

RESULTS:

We found that the retinal parenchyma showed prominent thickening but not statistically significant in rats with DM, corresponding to the retinal oedema, compared with the control and DM HBO groups. fluorescein isothiocyanate relative fluorescence intensity (Mean \pm SE) in normal control animals, diabetic animals, and HBO-treated diabetic animals was 356 \pm 47, 865 \pm 78, and 518 \pm 49, respectively, demonstrating significant difference between the means of diabetic and HBO-treated diabetic animals, and between means of control and diabetic animals (n=8, P<0.05). Retinal Evans blue leakage in control animals, diabetic animals, and HBO-treated diabetic animals was 7.6 \pm 2.9, 18.5 \pm 4.2 and 10.2 \pm 3.1 microL plasma/g retinal dry weight/h, respectively, demonstrating significant difference between the means of diabetic and HBO-treated diabetic animals, and between means of control and diabetic animals (n=8, P<0.05).

CONCLUSION:

HBO therapy may diminish the extent of the increased blood-retinal barrier breakdown in diabetic animals.

PMID:

16925707

[PubMed - indexed for MEDLINE]