

The Influence of Hyperbaric Oxygen on Haemorheological parameters in Diabetic Rats

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Abstract

The effect of hyperbaric oxygen (HBO₂) treatment on hemorheological parameters of diabetic rats was investigated. This study is a placebo-controlled, in vivo animal study. 30 streptozocin-induced diabetic rats were divided into two groups; one group received hyperbaric oxygen treatment while the other did not. Hematological and hemorheological parameters were tested with blood samples collected directly from the heart using surgical procedures. Student t-tests with a type I (f) error at 0.05 was used to test any significant difference between means of the hematologic and hemorheological parameters of the control (CON) and the HBO₂ groups. Compared with the placebo group, hyperbaric oxygen resulted in significant higher lipid peroxidation stress of the erythrocytes and resistance of erythrocytes to deformation in rats of the HBO₂ group. Whole blood viscosities measured at shear rates of 5, 150 and 400 sm⁻¹ were all higher for the rats in the HBO₂ group than those for rats in the control group. In addition, the oxygen delivery index was found to be significantly lower in rats of the HBO₂ group. Thus, our work demonstrates that hyperbaric oxygen treatment significantly changes the hemorheological parameters in diabetic rats.

Keywords

Hyperbaric oxygen, diabetic rats, blood viscosity, blood viscoelasticity, erythrocyte deformability