

Clinical efficacy of adjuvant therapy with hyperbaric oxygen in diabetic nephropathy

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Abstract

Background and objective: Diabetic kidney disease (DKD) is the most common microvascular chronic complication of diabetes mellitus. Hyperbaric oxygen (HBO2) therapy will increase the partial pressure of oxygen (PaO₂) and may improve cell repair processes, which can lead to better renal function. The objective of this study was to quantify the efficacy of adjuvant HBO2 to increase the glomerular filtration rate and urinary albumin excretion in diabetic patients, as well as determine its effectiveness to modify the clinical course of DKD.

Materials and methods: An experimental study was performed on patients with stage 3 and 4 DKD. Twenty sessions of HBO2 or ambient air in a hyperbaric chamber were administered. Estimated glomerular filtration rate, urine albumin:creatinine ratio calculation and clinical stage stratification were made prior to and after HBO2 administration. A descriptive, inferential and clinical efficacy analysis was performed.

Results: Urinary albumin/creatinine (UACR) mean values prior to HBO2 were 1452.9 ± 644.3 mg/g and decreased to 876.1 ± 504.0 mg/g at the end of the study ($p=0.06$). The patients in the control group showed a UACR mean of 2784.5 ± 2128.6 mg/g and 2861.4 ± 2424.2 mg/g at baseline and at the end of the study, respectively ($p=0.82$). Patients in the experimental/HBO2 group showed an estimated GFR of 27.3 ± 9.5 mL/min /1.73m² before HBO2, with a 34.4 ± 6.9 mL/min/1.73m² after treatment ($p=0.017$); control group eGFR was 30.1 ± 9.2 mL/min/1.73m², decreasing to 22.2 ± 6.8

mL/min/1.73m² (p=0.004). Relative risk 0.00, relative risk reduction -100%, absolute risk reduction -71.4%, 95% CI (-104.9% to -38.0%), NNT 1, 95% CI (1 to 3).

Conclusions: Management with HBO₂ for DKD was associated with decreased excretion urinary albumin, improved GFR and clinical stage of patients in stages 3 and 4 of kidney damage unlike those receiving ambient air..