HYPERBARIC OXYGEN TREATMENT IN MAINTAINING OF THE CARDIAC FUNCTION IN INSULIN-TREATED RATS WITH DIABETES TYPE 1

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The side effects of hyperbaric oxygen (HBO) treatment, such as oxidative stress and oxygen toxicity, have long been of interest. However, there are no comprehensive studies evaluating such toxic effects in diabetes mellitus (DM). The purpose of this study was to determine the effects of HBO on glucose homeostasis and cardiac function in experimentally induced diabetes and insulin treated and non-treated rats.
Diabetes was induced by intraperitoneal administration of 60 mg/kg streptozotocin to Wistar albino rats. A total of 48 male Wistar rats were randomly divided into 4 groups: 1) Control group, no diabetic induction without HBO treatment; 2) HBO group, exposed to 100% oxygen at 2.8 ATA (atmosphere absolute) for 1 h once daily, for 5 days (two weeks); 3) DM group, diabetes induced by streptozotocin (STZ) injection; and 4) DM + HBO group, received both STZ injection and HBO exposure; 5) DM+INS group, NPH insulin 5U/day, 6) DM+HBO+INS, received both NPH insulin and HBO exposure for 2 weeks.
The efficacy of the insulin therapy or HBO treatment was evaluated by comparing cardiac parameters among the experimental groups, as well as glycemia measurement. Glycemic levels, dp/dt max and min, SLVP, DLVP, HR and CF were reestablished in diabetic rats treated with insulin (ITD). We observed a 30% improving of cardiodynamics in the treated diabetic rat with insulin and HBO. We established an insulin therapy that consists of a daily insulin dose for all animals to maintain most of them at or near normoglycemia. Our results provide, what is to our knowledge, the most detailed schedule of insulin therapy for treating STZ-diabetic rats and HBO treatment.

Keywords: diabetes mellitus type 1, streptozotocin, hyperbaric oxygen therapy, neutral protamine hagedorn (NPH) insulin