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## 1st successful treatment for chronic TBI

New Orleans, LA -- A research team led by Dr. Paul Harch, Assistant Professor of Clinical Medicine at Louisiana State University Health Sciences Center New Orleans and Director of the LSU Hyperbaric Medicine Fellowship Program, has published findings that show hyperbaric oxygen therapy (HBOT) improved spatial learning and memory in a model of chronic traumatic brain injury. HBOT is the use of greater than atmospheric pressure oxygen as a pharmacologic treatment of basic disease processes/states and their diseases. The paper is reported in the October 12, 2007 issue of *Brain Research*. (Paper available upon request.)

The research team adapted a well-known acute animal model of focal traumatic brain injury to chronic brain injury to evaluate the ability of low-pressure hyperbaric oxygen therapy (HBOT) to improve behavioral and neurobiological outcomes. The 64 rat subjects were divided into three groups -- an untreated control group (22), an HBOT group treated with a human protocol (19), and a group treated with sham hyperbaric pressurization (23). The subjects were tested pre and then 31-33 days post HBOT using the Morris Water Task (MWT), a behavioral test which measures learning and memory. The HBOT group received low pressure twice daily therapy, and the sham-treated normobaric air group the identical schedule of air treatments using a sham hyperbaric pressurization. All groups were subsequently retested in the MWT. Post experiment, blood pressure density was measured in the brain and was correlated with MWT performance. HBOT caused an increase in vascular density in the injured hippocampus ( $p < 0.001$ ) and an associated improvement in spatial learning ( $p < 0.001$ ) compared to the control groups. The increased vascular density and improved MWT in the HBOT group were highly correlated ( $p < 0.001$ ). In conclusion, a 40-day series of 80 low-pressure HBOTs caused an increase in vascular density and an associated improvement in cognitive function. These findings reaffirm the clinical experience of HBOT-treated patients with chronic traumatic brain injury and write the authors, represent the first demonstration of noninvasive improvement of chronic brain injury in an animal model.

Traumatic brain injury (TBI) is a disorder of major public health significance. According to the National Institutes of Health, each year in the United States alone there are 100 new cases/100,000 population and 52,000 deaths. Most patients survive and add to an increasing prevalence of chronic TBI, estimated at 2.5-6.5 million individuals in 1998. Direct and indirect costs have been estimated at \$56 billion/year in 1995. Unfortunately, there is no cure for chronic TBI and only a few previous studies suggest effectiveness under limited conditions. These new findings could hold enormous significance not only for the million+ who sustain TBI from falls, motor vehicle accidents and assaults in this country each year, but also for returning US military veterans.

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