

Late Treatment of Severe Brain Injury with Hyperbaric Oxygenation
(Definitive evidence of brain death and/or recoverable idling neurons)

Richard A. Neubauer, M.D.
Virginia Neubauer
Franz Gerstenbrand, M.D.

ABSTRACT

Controlled studies have demonstrated safety and efficacy of hyperbaric oxygenation therapy (HBOT) in the treatment of anoxic, toxic, traumatic, ischemic, or thrombotic brain injury. Over the past 15 years, our clinic has treated 350 seriously brain-injured patients, from six months to 14 years after the event, suffering from various degrees of the apallic syndrome ranging from 1-8. Despite the hopeless prognosis that most patients were given by their physicians, varying degrees of clinical improvement occurred, along with substantial reductions in the cost of ongoing care. Such improvements were correlated with increased perfusion and metabolism with reactivation of dormant idling neurons demonstrated by sequential single photon emission computerized tomographic (SPECT) scanning.

Background

With major traumatic or ischemic brain insults, there is an epicenter of irreversible damage surrounded by a plume of viable but "idling" neurons. It is hypothesized that improved tissue oxygenation, made possible through the much higher plasma concentrations of oxygen that occur when patients breathe 100% oxygen under hyperbaric conditions, can revitalize these dormant neurons. This follows Henry's gas law and is especially applied in the CNS fluid.

In the 1970s, clinical and electroencephalographic (EEG) improvements were shown in both early and chronic post-stroke patients by Holbach and coworkers.¹ As previously noted,² randomized, controlled studies showed that HBOT improved survival and recovery rates in patients with traumatic brain injury,³ as well as having a favorable effect on cerebral metabolism and intracranial pressure.⁴

Our clinic was the first to demonstrate the existence of the ischemic penumbra and its reperfusion and recoverability after HBOT with sequential single photon emission computerized tomographic (SPECT) scanning.^{5,6}

As we believed that this experimental work and the encouraging clinical results offered a promising new modality to treat otherwise hopeless cases, we made it available to patients seeking our care.

Methods

As our facility is a clinic devoted to patient care rather than a research institution, we optimized each patient's treatment regimen according to our own judgment and the patient's circumstances. This is thus an observational study of approximately 350 patients referred to our clinic over 15 years as a "last resort."

nc.
or
onal
ar
on.

Second International Congress on
Vascular Dementia
Salzburg, Austria, January 24-27, 2002



Final Program & Book of Abstracts

Meeting Organizers:

KENES International

CARES FOR YOUR ORGANIZATION
GLOBAL CONGRESS ORGANIZERS AND
ASSOCIATION MANAGEMENT SERVICES

17 Rue du Cendrier, P.O. Box 1726
CH-1211 Geneva 1, Switzerland

Tel: +41 22 908 0488

Fax: +41 22 732 2850

Website: www.kenes.com

E-mail: kenesinternational@kenes.com