



Application of Hyperbaric Oxygen (HBO) therapy for patients with spontaneous intracranial hemorrhage (sICH): preliminary result of one university-affiliated medical center

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Introduction

Limited clinical data supports the indication of HBO for treating patients with sICH. This study focused on the patients who sustained **poor consciousness and response (GCS<5T)** one month after the brain insult. In prior to HBO, computed tomography (CT) scan was performed to exclude out newly onset lesion (hemorrhage, infarction or edema). By measuring modified Rankin scale (mRS) and tracking GCS, we try to determine the positive effect of HBO on sICH.

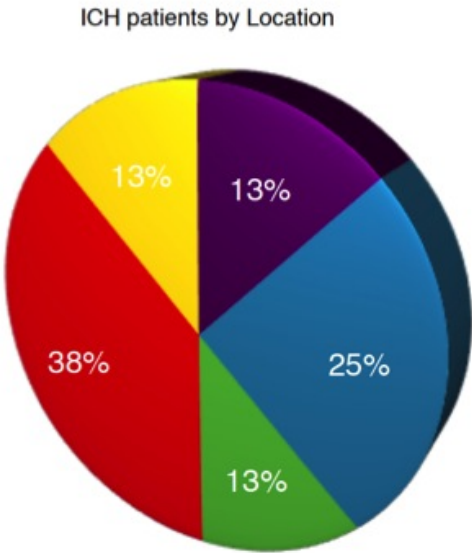
Methods

Between Mar. 2011 to June. 2012, sixteen patients with supratentorial sICH (including basal ganglia, putamen, and thalamus) underwent at least once EVD placement. Tracheostomy was done by the end of 2nd week with poor weaning profile. The HBO was conducted by 100% O2 tension, 2ATA for one hour per session for 8 patients and the others went conservative. Ten sessions were given within 2-week time. **The Glasgow Coma Scale (GCS) alteration** and **outcome assessment** (by **modified Rankin scale, mRS**) were analyzed by linear regression statistic.



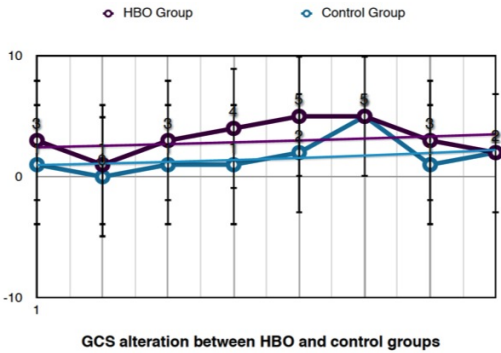
Distribution of ICH by Location

- Basal ganglia
- Putamen
- Cortical
- Thalamus
- Caudate
- with IVH



Pie Chart by Percentage

GCS alteration through the treatment



Group comparison

Demographic table and outcome analysis

	HBO group (8)	Control group (8)
Demographic		
Age(Yr)	67.5	70.2
Gender(M:F)	5:3	6:2
Involved side (R:L)	6:2	4:4
Comorbidity	HTN(7), CV(4)	HTN(8), CV(6), CHE(2)
Initial GCS on admission	6.5	6.38
Major deficit before HBO	Drowsy(6), Plegia(5)	Drowsy(7), Plegia(8)
Treatment Outcomes		
GCS alteration at 6 m	3.2	1.6
modified Rankin Scale (mRS) at 6 m	2.6	4.5
Residual major deficit	Paresis(2) Spasticity(1)	Stupor(3) Paresis(3) Cognition(1) Circadian Rhythm confusion(6)
Complications	No HBO-related	Tympanic rupture(2)

CV: dysrhythmia, valvular heart disease and MI
CHE: COPD and pulmonary arterial hypertension
Confusion, drowsy and stupor are all conscious disturbance
Cognition means disorientation sequelae

Results

In comparing clinical parameters between 2 groups, the GCS sloped upwards after the completion of HBO therapy (mean 3.2 vs 1.6). Good mRS (mean 4.5) was observed in HBO group and OR of 2.8 rather than conservative group is **associated with better end-result in our cohort at 6 months**

Learning Objectives

- 1.Knwoing the alternative adjuvant therapy of sICH.
- 2.Knwoing the indications and contraindications of HBO when considering as supplement therapy.
- 3.Exploring the optimal timing to initiate HBO after the cerebrovascular insult.
- 4.Exploring the potential use for radio-sensitizing of brain tumors, brain abscess, cerebral ischemia caused by vessel occlusion and brain edema or vasospasm following aSAH is expected.

Conclusions

Our preliminary results and limited cases support the application of **HBO on sICH as a promising adjunct in additional to medication**. A prospective randomized study is indicated to validate the critical role for sICH.

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