

## Original article

# Evaluation of hyperbaric oxygen treatment of neuropsychiatric disorders following traumatic brain injury

SHI Xiao-yan, TANG Zhong-quan, SUN Da and HE Xiao-jun

**Keywords:** traumatic brain injury; hyperbaric oxygenation; computed tomography, single photon; emission computed tomography

**Background** Improvement of clinical symptoms following hyperbaric oxygen (HBO) treatment of neuropsychiatric disorders arising from traumatic brain injury was proved by our previous study. This study was aim to obtain the evidence of other changes.

**Methods** Three hundred and ten patients with neuropsychiatric disorders arising from traumatic brain injury were treated twice with hyperbaric oxygen. Cerebral single photon emissions computed tomography (SPECT) images and computed tomography scans (CT) before and after hyperbaric oxygen treatment, were compared.

**Results** Before treatment, the proportion of abnormal cerebral changes detected by SPECT was 81.3% but only 15.2% by CT. After HBO treatment, 70.3% of SPECT scans showed no abnormalities and these patients were clinically improved. Treatment improved regional cerebral blood flow.

**Conclusion** SPECT was much more sensitive than CT in the diagnosis of neuropsychiatric disorders following hyperbaric oxygen treatment of neuropsychiatric disorders arising from traumatic brain injury.

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Psychiatric disorder often occurs after traumatic brain injury (TBI).<sup>1</sup> We noted the clinical effectiveness of hyperbaric oxygen (HBO) in treatment of neuropsychiatric disorders after TBI. Initially, the evaluation of its effects was only based on the improvement of clinical symptoms and there was no any other objective evidence to support the improvement. To study the effects of HBO on cerebral blood flow (CBF) and the usefulness of single-photon-emission computed tomography (SPECT) images in the diagnosis and assessment of neuropsychiatric disorders after TBI, we compared the results of cerebral SPECT and cerebral computed tomography (CT) before and after HBO treatment.

## METHODS

### Patients

Three hundred and ten patients with neuropsychiatric disorders arising from TBI were included (male 206, female 104, aged 12 to 78 years, mean 45 years). Eighteen patients were younger than 15 years, 20 patients were older than 60 years. All the patients had been diagnosed as head trauma based on (1) clear cut head trauma history; (2)

headache, dizziness, poor memory, epilepsy, hysteria, poor concentration and attention deficit; (3) no history of intracranial space occupying lesion, hypertension or cardiovascular diseases. Among the 310 patients, 212 had a disease course of 1 to 6 months, 79 had a course of 6 months to 1 year and 19 had a course longer than 1 year. Two hundred and twenty-five patients had headache, dizziness, poor memory, epilepsy, hysteria and poor concentration. Forty-seven patients had epilepsy and thirty-eight patients had post traumatic hydrocephalus.

Neuroscience Care Unit, Second Affiliated Hospital of Zhejiang University College of Medicine, Hangzhou 310009, China (Shi XY)

Department of Hyperbaric Oxygen, Second Affiliated Hospital of Zhejiang University College of Medicine, Hangzhou 310009, China (Tang ZQ)

Department of Nuclear Medicine, Second Affiliated Hospital of Zhejiang University College of Medicine, Hangzhou 310009, China (Sun D)

Editorial Board of Chinese Journal of Emergency Medicine, Hangzhou 310009, China (He XJ)

Correspondence to: Dr. SHI Xiao-yan, Neuroscience Care Unit, Second Affiliated Hospital of Zhejiang University College of Medicine, Hangzhou 310009, China (Tel:86-571-87783951. Fax: 86-571-87783647. Email: xys0571@hotmail.com)