

Hyperbaric oxygen therapy for radionecrosis

Small trials suggest that for people with LRTI affecting tissues of the head, neck, anus, and rectum, HBOT is associated with improved outcomes. HBOT also reduces the chance of ORN following tooth extraction in an irradiated field. There was no such evidence of any important clinical effect on neurological tissues. The application of HBOT to selected participants and tissues may be justified. Further research is required to establish the optimum participant selection and timing of any therapy. An economic evaluation should be undertaken ¹⁾

38 patients were studied 19 with 25 brain metastases treated with HBO prior to SRS, and 19 historical controls with 27 metastases, matched for histology, GPA, resection status, and lesion size. Outcomes included time from HBO to SRS, quality-of-life (QOL) measures, local control, distant (brain) metastases, radionecrosis, and overall survival.

The average time from HBO chamber to SRS beam-on was 8.3 ± 1.7 minutes. Solicited adverse events (AEs) were comparable between HBO and control patients; no grade III or IV serious AEs were observed. Radionecrosis-free survival (RNFS), radionecrosis-free survival before whole-brain radiation therapy (WBRT) (RNBWFS), local recurrence-free survival before WBRT (LRBWFS), distant recurrence-free survival before WBRT (DRBWFS), and overall survival (OS) were not significantly different for HBO patients and controls on Kaplan-Meier analysis, though at 1-year estimated survival rates trended in favor of SRS + HBO: RNFS - 83% vs 60%; RNBWFS - 78% vs 60%; LRBWFS - 95% vs 78%; DRBWFS - 61% vs 57%; and OS - 73% vs 56%. Multivariate Cox models indicated no significant association between HBO treatment and hazards of RN, local or distant recurrence, or mortality; however, these did show statistically significant associations ($p < 0.05$) for: local recurrence with higher volume, radionecrosis with tumor resection, overall survival with resection, and overall survival with higher GPA.

The addition of HBO to SRS for brain metastases is feasible without evident decrement in radiation necrosis and other clinical outcomes ²⁾

A retrospective review of patients with symptomatic brain RN between 2008 and 2018 who was treated with HBOT. Demographic data, steroid use, clinical response, radiologic response, and toxicities were collected. The index time for analysis was the first day of HBOT. The primary endpoint was a clinical improvement of a presenting symptom, including steroid dose reduction.

Results: Thirteen patients who received HBOT for symptomatic RN were included. The median time from the last brain radiation therapy to presenting symptoms of brain RN was 6 months. Twelve patients (92%) had clinical improvement with a median time to symptom improvement of 33 days (range 1-109 days). One patient had transient improvement after HBOT but had recurrent symptomatic RN at 12 months. Of the eight patients with evaluable follow-up MRI, four had radiological improvement while four had stable necrosis appearance. Two patients had subsequent deterioration in MRI appearances, one each in the background of initial radiologic improvement and stability. Median survival was 15 months with a median follow-up of 10 months. Seven patients reported side effects attributable to HBOT (54%), four of which were originally otologic.

Conclusions: HBOT is a safe and effective treatment for brain RN. HBOT showed clinical and radiologic

improvement or stability in most patients. Prospective studies are needed to further evaluate the effectiveness and side effects of HBOT ³⁾

1)

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2)

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3)

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Last update: **2024/06/07 02:56**

