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Abstract:

Sixteen patients, 12 with episodic and four with chronic cluster headache (CH) according to the International Headache Society criteria (1), participated in the study. They were randomly selected to start with one out of two different hyperbaric treatments in a double-blind, placebo-controlled, cross-over study design. Both gases were administered by mask inside a multiplace hyperbaric chamber for 70 min at 250 kPa (2.5 ATA) in two sessions 24 h apart. Active treatment was 100% oxygen (HBO treatment), while placebo treatment was 10% oxygen in nitrogen (hyperbaric normoxic placebo = sham treatment) corresponding to breathing air at sea level. All patients were decompressed on air. The patients documented the number of headache attacks and their degree of severity according to a modified VAS scale (level 0-4, where level 0 = no headache and level 4 = very severe headache). A headache index (HI = sum of (number of attacks times degree of severity)) was calculated for the run-in week prior to and the week after each separate treatment. A treatment was regarded as effective if it reduced the HI by >50%. Blood samples were taken from the external jugular vein before and during hyperbaric treatment (after 30 and 70 min), 1 day and 1 week after each treatment for analyses of calcitonin gene-related peptide (CGRP), vasoactive intestinal peptide (VIP) and neuropeptide Y (NPY) and in a few patients also endotheline and nitrate. No difference between HBO and sham treatment on the HI or the prophylactic effect was observed in our study. However, 83% of the episodic CH patients and 25% of the chronic ones responded to either of the two treatments with at least 50% reduction of HI or remission for shorter or longer periods. This response rate exceeds an expected high placebo response due to the study procedure. Two episodic CH patients still experienced remission on follow-up 1 year after sham treatment. Five patients reported mild or moderate CH attacks during the sham treatment, and none during the HBO treatment. Changes in neuropeptides, endotheline and nitrate levels did not differ systematically when comparing the two different hyperbaric treatments or with respect to responders and non-responders. We conclude that two HBO sessions were not more effective than two sham treatments in reducing the HI and interrupting the CH period when given in a well-established cluster period or in chronic CH. The hyperbaric condition itself seems effective in reducing the HI, at least in patients with episodic CH, although a powerful placebo response can not be ruled out.

Keywords: Cluster headache; episodic; chronic; hyperbaric; neuropeptides; oxygen

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