Effect of sleeping in a head-up position on intraocular pressure in patients with glaucoma

Buys YM, Alasbali T, Jin YP, Smith M, Gouws P, Geffen N, Flanagan JG, Shapiro CM, Trope GE

Department of Ophthalmology and Vision Sciences, University of Toronto, Toronto, Ontario, Canada. y.buys@utoronto.ca

Abstract
PURPOSE: To determine whether a 30-degree head-up sleeping position decreases nocturnal intraocular pressure (IOP) compared with lying flat in patients with glaucoma.

DESIGN: Prospective, nonrandomized comparative case series.

PARTICIPANTS: Seventeen eyes of 17 patients with glaucoma with controlled IOP and new disc hemorrhage.

METHODS: Patients with a new disc hemorrhage despite well-controlled IOP were evaluated in a sleep laboratory on 2 separate nights, the first night lying flat and the second night in a 30-degree head-up position. Intraocular pressure and blood pressure (BP) were measured every 2 hours from 6 PM to 8 AM. For the 6 PM, 8 PM, 10 PM, and 8 AM measurements (awake period) the subjects were sitting for both nights. For the midnight, 2 AM, 4 AM, and 6 AM measurements (sleep period) , the subjects were supine for the first night and 30 degrees head up for the second night.

MAIN OUTCOME MEASURE: Difference in IOP during the sleep period (midnight to 6 AM) between lying flat and 30-degree head-up positions.

RESULTS: Seventeen eyes of 17 patients were included. There were no significant differences (P=0.68) between the 2 study visits in IOP during the awake period (6 PM, 8 PM, 10 PM, and 8 AM) when patients were sitting upright. During the sleep period (midnight to 6 AM) the mean IOP was 3.2 mmHg lower in the 30-degree head-up position compared with the flat position (P=0.03; 95% confidence interval, 0.25-6.1 mmHg) . Sixteen of 17 patients (94.1%) had lower IOP in the 30-degree head-up position. The reduction in IOP in the 30-degree head-up position was 20% or more in 35% of patients (6/17) . There were no differences in BP or ocular perfusion pressure between the 2 positions.

CONCLUSIONS: The 30-degree head-up sleeping position lowers IOP compared with the flat position. Although this effect varies between individual patients, mean IOP was 20% lower in one third of patients in this series.

FINANCIAL DISCLOSURE(S) : The authors have no proprietary or commercial interest in any materials discussed in this article.

http://www.ncbi.nlm.nih.gov/pubmed/20188421