A Case of Hypertensive Intracerebral Hemorrhage Accompanying Sleep Apnea

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INTRODUCTION

Stroke is very common in patients with sleep disordered breathing, especially in the elderly. We report the case of a 26-year-old man who had been referred to us with a sudden left side motor weakness of the body, headache, chronic fatigue, and witnessed sleep apneas. Intracerebral hemorrhage in the right external capsule and putamen was identified upon brain computed tomography. He had hypertension which had not been diagnosed previously. On polysomnography, apnea-hypopnea index was 73.0/h and arousal index was 74.7/h, indicating severe sleep apnea. Continuous positive airway pressure titration was conducted to determine the optimal pressure to alleviate the respiratory disturbances. Treatment with antihypertensive medication reduced blood pressure (BP) from 197/145 mm Hg to 130/80 mm Hg after 10 days of use. Co-treatment with the medication and auto-adjustable positive airway pressure additionally decreased BP to 110/60 mm Hg and normalized respiratory disturbances. In addition to BP, left hemiparesis, morning headache, daytime sleepiness, and chronic fatigue were all improved. Early treatment of OSA could help facilitate the rehabilitation of or recovery of weakness in such patients.

Key Words: Stroke, Intracerebral hemorrhage, Apnea-hypopnea index, Sleep apnea, Continuous positive airway pressure.
A 26-year-old man was referred to the emergency room because of chief complaints of sudden left side motor weakness of the body, which occurred during a class. He also complained of headache, chronic fatigue, and excessive daytime sleepiness. Witnessed sleep apnea was noted by a nurse in the intensive care unit, and the sleep center was consulted for evaluation of sleep apnea. Blood pressure (BP) was reported to be 197/145 mm Hg in the admission examination, but the patient had no history of taking medication for HTN. The physical examination revealed the patient’s weight to be 95 kg, with a height of 172 cm (body mass index = 32.1 kg/m²), and his neck circumference of 40 cm (15.75 inch). He was not a current smoker, but had a history of 3 years. Upon brain computed tomography (CT), he was diagnosed with acute ICH in the right external capsule and putamen by a neurologist (Fig. 1). Brain angiography was further conducted, but no occlusion or stenosis in vessels and no outpouching lesion were found. 2-dimensional echocardiography (M-Mode) revealed mild concentric left ventricular hypertrophy (left ventricular mass index = 124 g/m²) and mild left atrium enlargement (left atrial volume index = 33 mL/m²). On electrocardiogram, normal sinus rhythm with sinus arrhythmia, non-specific T wave abnormality, and prolonged QT were observed. No abnormality in the chest was found by chest X-ray examination. Upon blood chemistry examination, he had higher levels of alanine aminotransferase (88 IU/L), glucose (143 mg/dL), triglyceride (511 mg/dL), and total lipids (1066 mg/dL) than the reference range. Notably, free epinephrine (143 mg/dL), triglyceride (511 mg/dL), and total lipids (1066 mg/dL) than the reference range. Notably, free epinephrine (143 mg/dL), triglyceride (511 mg/dL), and total lipids (1066 mg/dL) than the reference range. Most of the left hemiparesis was improved. Moreover, body weight and BP were also reduced. As a subjective indicator, morning headache, daytime sleepiness, and chronic fatigue were all improved.

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Hypertensive Intracerebral Hemorrhage with Sleep Apnea

DISCUSSION

Sleep-disordered breathing includes OSA, snoring, upper airway resistance syndrome, and central hypoventilation. Among them, obstructive sleep apnea syndrome (OSAS) is the most common type of sleep-disordered breathing, affecting 5–15% of the general population. SDB is highly prevalent in patients with cerebrovascular disease. OSA has been observed in up to 77% of patients with acute ischemic stroke, and has been related to increase in the long-term mortality in this population.

Sleep-disordered breathing can act as a risk factor of stroke. According to a prospective study from the Wisconsin Sleep Cohort, an AHI index of > 20/h was associated with a 4-fold increased risk of having stroke during a 4-year follow-up study. Another prospective study also reported similar results, in which patients with OSAS had a 2-fold higher risk of developing stroke compared with non-OSAS groups over a 3.5 year follow-up, even after adjusting for possible confounders. Intracerebral hemorrhage is the most deadly subtype of stroke, and approximately 65% of its surviving victims were found to have died after 1 year. OSA, as defined by AHI ≥ 10, was found in 59.4% in 32 non-comatose patients with acute hypertensive ICH.

The mechanisms underlying cerebrovascular disease in patients with OSA are likely to be multifactorial. Several mechanisms have been considered: hemodynamic disturbances such as HTN, arrhythmias caused by sympathetic activation, endothelial dysfunction, prothrombotic state, and increased inflammatory processes.

Continuous positive airway pressure therapy is the current treatment used for patients with OSA. The use of CPAP resulted in reductions in systolic BP (-3.20 mm Hg) and diastolic BP (-2.19 mm Hg) in hypertensive patients. Hafner RL, Kozar LF, Render-Teixeira CL, Phillipson EA. Obstructive sleep apnea as a cause of systemic hypertension. Evidence from a canine model. J Clin Invest 1997;99:106-9. Continuous positive airway pressure therapy is the current treatment used for patients with OSA. The use of CPAP resulted in reductions in systolic BP (-3.20 mm Hg) and diastolic BP (-2.19 mm Hg) in hypertensive patients with sleep apnea, possibly by decreasing sympathetic tone and nocturnal hypoxemia, or by preventing pleural pressure fluctuations.

In rare cases, brain damage may contribute to the development of SDB. Cheyne-Stokes breathing can be seen in patients with unilateral lesions of variable topography without clinically overt heart failure. Patients with focal lesions in the rostral medulla had reduced ventilatory sensitivity to inhaled carbon dioxide and higher incidence of sleep apnea compared to subjects with no lesions and normal ventilator sensitivity to carbon dioxide. Thus, it could not be determined whether the SDB found in the patient herein was the cause or consequence of the ICH, due to the cross-sectional design of this study. Given that the patient complained of having sleep apnea several years earlier, before the left side hemiparesis became prominent, and that the ICH region was limited to the cerebral region, however, it is reasonable to think that SDB may have affected the development of ICH, although other risk factors should be considered. Re-evaluate of the brain CT was not carried out after APAP, but it is generally known that cerebral hemorrhage is always decreased and eventually absorbed. In addition, hemiparesis usually improves as time goes by. Further study is required to elucidate the degree of contribution of APAP treatment to the improvement in hemiparesis and the size of cerebral hemorrhage in ICH patients accompanied with SDB.

Through this case, we emphasize that the early treatment of OSA could facilitate the rehabilitation of or recovery of weakness in such patients, with some references.

Conflicts of Interest

The authors have no financial conflicts of interest.

REFERENCES


