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Hypertension and stroke in a young man with obstructive sleep apnea syndrome

Satyanarayana K. Tikare, MD, Bashir A. Chaudhary, MD, Madhukar S. Bandisode, MD

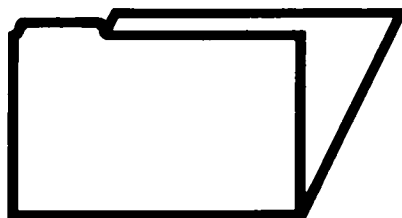
POSTGRADUATE MEDICINE invites submission of brief case reports, especially those related to ambulatory medical care. Illustrations and references should be included only when essential.

A 34-year-old man was admitted to the Veterans Administration Medical Center, Augusta, Georgia, on May 1, 1983, with weakness and numbness of the right upper and lower extremities since that morning. He had a history of hypertension and diabetes mellitus of five years' duration and admitted to noncompliance with both his blood pressure medications and diabetic diet.

Physical examination revealed the following: blood pressure 150/100 mm Hg, pulse rate 74/min and regular, respiration rate 20/min, temperature 37 °C (98.6 °F), weight 117.9 kg (262 lb), height 177.5 cm (5 ft 11 in). The neck was broad and thick, the tonsils were markedly enlarged, and the uvula was elongated. Respiratory sounds were normal with no rales or rhonchi, and heart sounds were normal without murmur, gallop, or rub. Neurologic findings were consistent with right-sided hemiplegia, but speech was not affected.

Results of laboratory studies were as follows: pH 7.41, PO₂ 70 mm Hg, PCO₂ 44 mm Hg, hemoglobin 16.5 gm/dl, hematocrit

49.1%, fasting plasma glucose 227 mg/dl, serum cholesterol 104 mg/dl, serum triglycerides 455 mg/dl, serum ANAs absent, serologic test for syphilis negative, CSF values within normal limits, no glucose 6-phosphate dehydrogenase deficiency or hemoglobinopathy detected. A chest roentgenogram and an



CASE REPORT

ECG were normal. A computed tomographic scan of the head done the day after admission revealed a paraventricular area of low attenuation. Holter monitoring showed rare premature ventricular contractions; multiple gated acquisition radionuclide angiocardiology revealed mild left ventricular hypokinesis with a global ejection fraction of 48%.

Stertorous breathing began immediately when the patient was placed in the supine position. Further history taking revealed excessive snoring and marked daytime somnolence of indefinite duration. Several episodes of apnea were observed during "apnea checks" performed as he slept.

Polysomnography was conducted at the sleep laboratory of Eugene Talmadge Memorial Hospital, Augusta, Georgia, on May 31, 1983. The study consisted of an EEG, measurement of chest and abdominal wall expansion, ear oximetry, and air-flow measurement at the mouth and nostrils. These readings were recorded for four and a half hours. During this time the patient had 281 episodes of apnea, with each episode lasting 10 to 50 seconds. The apnea was generally obstructive, with a few episodes of mixed type. Oxygen saturation ranged from 70% to 85%, and the apnea index (number of apnea episodes per sleep hour) was 77.84. The patient spent 54.9% of his sleep time in an apneic state. The diagnosis was severe sleep apnea syndrome and paradoxical breathing pattern.

On June 9, 1983, the patient underwent a tracheostomy and uvulopalatopharyngoplasty with
continued

CASE REPORT CONTINUED

tonsillectomy. After surgery his sleep apnea syndrome improved; he had decreased stertorous breathing, improved sleep pattern, and decreased daytime somnolence. After removal of the tracheostomy tube eight days later, the tracheostomy stoma closed spontaneously.

A moderately salt-restricted diet and hydrochlorothiazide, 50 mg once a day, controlled the hypertension; a 1,500-calorie diabetic diet and tolazamide (Tolnase), 250 mg once a day, controlled the hyperglycemia. After adequate physical and occupational therapy for his stroke, the patient was discharged on July 21, 1983. His weight at discharge was 113.4 kg (252 lb).

Polysomnography was repeated in January 1984 and showed no evidence of sleep apnea syndrome. Oxygen saturation was 87% to 95%. When the patient was last seen in October 1984,

his improved sleep pattern had persisted and he denied excessive daytime sleepiness. Hypertension was controlled with hydrochlorothiazide, 50 mg once a day, and methyldopa (Aldomet), 250 mg three times a day. However, he was noncompliant with the recommended diet and, consequently, had gained 7.65 kg (17 lb) since discharge (current weight 121.05 kg [269 lb]). Fasting plasma glucose was 172 mg/dl, although he was still receiving tolazamide.

Discussion

Sleep-related disorders have recently been recognized as quite prevalent and also potentially life-threatening.¹ The increasing availability of sleep laboratories has improved the understanding of these disorders considerably. Obstructive sleep apnea syndrome is one of the commonly encountered sleep-related disorders. Well-known presenting features of this syndrome include loud snoring, disturbed sleep, excessive daytime sleepiness, personality changes, and sexual problems. Subjects show nocturnal cardiac arrhythmias, significant hypoxemia, and transient arterial and pulmonary hypertension during sleep.²

A high incidence of established arterial hypertension has been reported in several studies

continued on page 64

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Information for Patients: Patients should use caution for activities requiring alertness if they experience drowsiness, dizziness, vertigo or depression during therapy.

Drug Interactions: Use caution when giving concomitantly with coumarin-type anticoagulants; a hydantoin, sulfonamide or sulfonilurea; furosemide; lithium; beta-blockers; probenecid; or methotrexate.

Drug/Laboratory Test Interactions: The drug may decrease platelet aggregation and prolong bleeding time or increase urinary values for 17-ketogenic steroids. Temporarily stop therapy for 72 hours before doing adrenal function tests. The drug may interfere with urinary assays of SHIAA.

Carcinogenesis: A 2-year rat study showed no evidence of carcinogenicity.

Pregnancy: Category B. Do not use during pregnancy unless clearly needed. Avoid use during late pregnancy.

Nursing Mothers: Avoid use in nursing mothers.

Pediatric Use: Indications and dosage have not been established.

Adverse Reactions: Incidence Greater Than 1%: GI: The most frequent complaints related to the GI tract: constipation, heartburn, abdominal pain, nausea, dyspepsia, diarrhea, stomatitis. CNS: headache, dizziness, drowsiness, light-headedness, vertigo. Dermatologic: itching (pruritis), skin eruptions, ecchymoses, sweating, purpura. Special Senses: tinnitus, hearing disturbances, visual disturbances. Cardiovascular: edema, dyspnea, palpitations. General: thirst. *Incidence of reported reaction 3%-9%. Where unmarked, incidence less than 3%. Incidence Less Than 1%: Probable Causal Relationship: GI: abnormal liver function tests, GI bleeding and/or perforation, hematemesis, jaundice, melena, peptic ulceration with bleeding and/or perforation, vomiting. Renal: glomerular nephritis, hematuria, interstitial nephritis, nephrotic syndrome, renal disease. Hematologic: eosinophilia, granulocytopenia, leukopenia, thrombocytopenia. CNS: depression, dream abnormalities, inability to concentrate, insomnia, malaise, myalgia and muscle weakness. Dermatologic: alopecia, skin rashes. Special Senses: hearing impairment. Cardiovascular: congestive heart failure. Respiratory: eosinophilic pneumonitis. General: anaphylactoid reactions, menstrual disorders, pyrexia (chills and fever). Causal Relationship Unknown: Hematologic: agranulocytosis, aplastic anemia, hemolytic anemia. CNS: cognitive dysfunction. Dermatologic: urticaria. GI: ulcerative stomatitis. General: angioneurotic edema, hyperglycemia, hypoglycemia.

Overdosage: May have drowsiness, heartburn, indigestion, nausea, vomiting. Empty stomach and use usual supportive measures. Prompt administration of 5 grams activated charcoal may reduce drug absorption.

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CASE REPORT CONTINUED

of sleep apnea syndrome. Luga-resi and associates³ found a relationship between snoring and hypertension in a survey of 5,713 individuals. Hypertension was more common among habitual snorers than among non-snorers. In the age-group of 41 to 60 years, hypertension was present in 15.2% of snorers and 7.5% of nonsnorers.

In subjects with proven sleep apnea syndrome, the prevalence of hypertension is even higher. In a study by Onal and colleagues,⁴ seven of eight sleep apnea patients had a history of hypertension. Guilleminault and associates² found blood pressure readings of 150/100 mm Hg or higher in 50% of 50 patients who had obstructive sleep apnea syndrome. An additional 10% had blood pressure readings of 140/90 mm Hg with occasionally higher pressures at later clinic visits. However, after tracheostomy, blood pressure returned to normal levels in only two young (12- and 14-year-old) patients. In these two patients, hypertension had developed during the months before surgery. The decline was from 150/100 to 125/75 mm Hg in one and from 160/105 to 115/65 mm Hg in the other. None of the adults with documented daytime hypertension had such a spectacular decline in blood pressure. However,

10 (40%) of the 25 patients with high blood pressure had their antihypertensive drug intake reduced and had a mean decrease of 18 mm Hg systolic and 15 mm Hg diastolic pressure compared with pretracheostomy readings.

Our patient had had a history of hypertension for five years before obstructive sleep apnea syndrome was diagnosed. Although the syndrome resolved completely after uvulopalatopharyngoplasty and tonsillectomy, his high blood pressure did not return to normal levels. Hypertension is a well-known risk factor for stroke and may have been the sole causative factor for the development of stroke in our patient. Whether hypoxemia and cardiac arrhythmias, commonly observed with obstructive sleep apnea syndrome, played a contributory role is not known.

Tracheostomy was first reported as an effective treatment of obstructive sleep apnea syndrome in 1969.⁵ Guilleminault and associates² found that on a long-term basis, the tracheostomy completely relieved the symptoms of obstructive sleep apnea. However, temporary closure of the tracheostomy during sleep led to recurrence of obstructive sleep apnea. Further, tracheostomy is associated with certain psychosocial problems and with potential complica-

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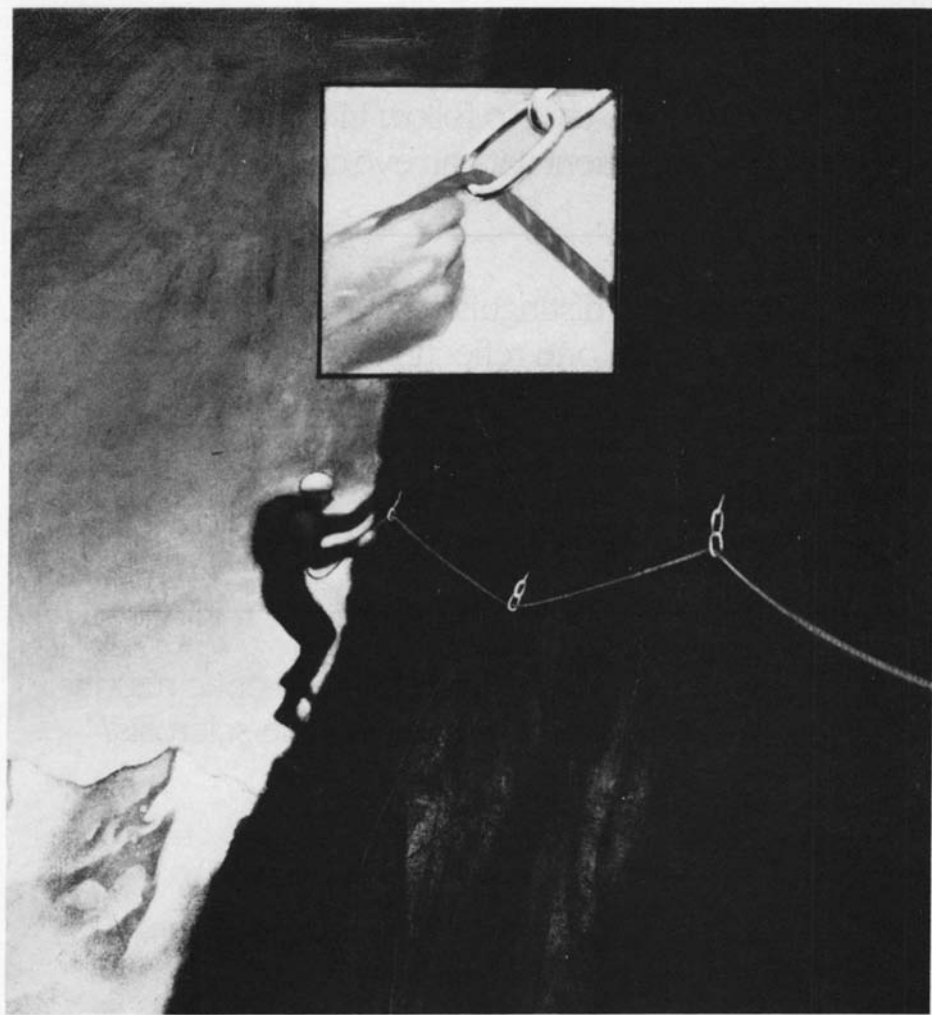
tions.⁶ A new surgical approach, uvulopalatopharyngoplasty, described by Fujita and associates,⁶ appears to be effective in correcting obstructive sleep apnea syndrome. This procedure, combined with a temporary tracheostomy, was successful in correcting the problem in our patient.

A nonsurgical approach to treating obstructive sleep apnea was developed recently by Sullivan and associates.^{7,8} This method of treatment consists of applying continuous positive airway pressure, via a comfortable nose mask, through the nostrils during sleep. Sullivan and colleagues⁷ first reported reversal of obstructive sleep apnea by this treatment in 1981 in five patients. In 1983, the same group⁸ reported remission of severe obesity-hypoventilation syndrome (Pickwickian syndrome) in two other patients with use of this approach.

Summary

In the case reported here, a 34-year-old man with severe obstructive sleep apnea syndrome had arterial hypertension and had had a stroke that caused right hemiplegia. A review of the literature reveals a surprisingly high occurrence of arterial hyperten-

continued



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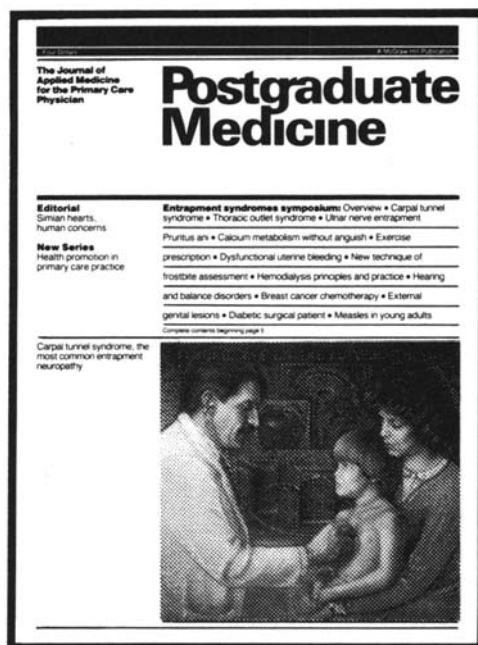
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QUESTIONS?

- 1** What are the steps to follow in office examination of a patient with an eye complaint?
- 2** How can you distinguish a purely ophthalmic problem from one reflecting systemic disease?
- 3** Which common conditions of the eye may progress to threaten vision if untreated?
- 4** What should you tell patients with optic neuritis regarding the risk of future multiple sclerosis?

ANSWERS:

COMING IN THE DECEMBER ISSUE



CASE REPORT CONTINUED

sion in subjects with obstructive sleep apnea syndrome, including children. The cause of hypertension in these patients is not clear. Surgical procedures and a new nonsurgical treatment have been successful in relieving the symptoms of obstructive sleep apnea. Our patient's symptoms resolved completely after uvulopalatopharyngoplasty and tonsillectomy. However, his arterial hypertension persisted. FGM

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