

Obstructive Sleep Apnea in a Young Stroke: A Case Report

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Abstract: Stroke in young adults is relatively uncommon, and the underlying etiology often differs from that observed in older populations. Obstructive sleep apnea (OSA) is increasingly recognized as an independent and underdiagnosed risk factor for cerebrovascular disease. We report the case of a 27-year-old previously healthy male who presented with acute right-sided weakness and slurred speech. Neuroimaging revealed an acute left basal ganglia infarct consistent with a lacunar stroke, and computed tomography angiography demonstrated no evidence of large-vessel occlusion. The patient received intravenous alteplase within two hours of symptom onset according to institutional stroke protocol. During hospitalization, he was observed to have loud snoring, excessive daytime somnolence, nasal speech, and grade 3 tonsillar hypertrophy, raising suspicion of obstructive sleep apnea as a contributing factor. Laboratory investigations revealed elevated hemoglobin and hematocrit levels suggestive of secondary polycythemia. The patient was treated with physiotherapy and secondary stroke prevention therapy and was referred for further evaluation of suspected sleep-disordered breathing. This case highlights the importance of considering obstructive sleep apnea as a potential contributor to ischemic stroke in young individuals without traditional vascular risk factors.

Keywords: Obstructive sleep apnea, young stroke, lacunar infarction, sleep-disordered breathing, polycythemia.

1. Introduction

Stroke in young adult's accounts for approximately 10–15% of all stroke cases, and its etiology often differs from that seen in older individuals. Traditional vascular risk factors such as hypertension, diabetes mellitus, dyslipidemia, and atherosclerosis are less common in this age group, making identification of alternative causes essential.

Obstructive sleep apnea (OSA), characterized by recurrent episodes of upper airway obstruction during sleep, has emerged as an underrecognized and independent risk factor for cerebrovascular disease. The pathophysiological mechanisms linking OSA to stroke include intermittent hypoxia, oxidative stress, sympathetic nervous system activation, systemic inflammation, and endothelial dysfunction, all of which contribute to vascular injury and thrombogenesis.

This report describes a case of ischemic stroke in a young adult without conventional vascular risk factors, in whom clinical features suggestive of obstructive sleep apnea were identified during hospitalization.

2. Case Presentation

A 27-year-old right-handed male with no significant past medical history presented with acute onset right-sided weakness and slurred speech. He was a non-smoker and had no history of hypertension, diabetes mellitus, dyslipidemia, or prior cerebrovascular disease. On presentation, the National Institutes of Health Stroke Scale (NIHSS) score was 2. Vital signs were stable, and cardiovascular, respiratory, and abdominal examinations were unremarkable.

Computed tomography of the brain revealed an acute left basal ganglia infarct consistent with a lacunar stroke. Computed tomography angiography showed no evidence of large-vessel occlusion. The patient received intravenous alteplase (0.9 mg/kg) within two hours of symptom onset in accordance with institutional stroke protocol. Post-thrombolysis, his NIHSS score was 3. Electrocardiography demonstrated normal sinus rhythm without ischemic changes.

During admission, the patient was observed sleeping with a flexed neck posture and required repeated verbal stimulation to awaken. His speech had a nasal quality, and neurological examination demonstrated right facial weakness and mild right hemiparesis.

The patient had a body mass index of 23 kg/m² and no features suggestive of metabolic syndrome. Neck circumference was within normal range, and there were no craniofacial abnormalities. However, physical examination revealed grade 3 tonsillar hypertrophy and nasal obstruction, suggesting a structural cause of upper airway obstruction.

Routine laboratory investigations showed normal glucose and lipid profiles but elevated hemoglobin (16.6 g/dL) and hematocrit (51%), suggestive of polycythemia. During hospitalization, the patient received physiotherapy and secondary prevention therapy with antiplatelet and statin medications. Loud snoring, daytime somnolence, and recurrent tonsillitis were also noted, raising suspicion of obstructive sleep apnea as a contributing factor. The patient was advised to undergo polysomnography for confirmation of obstructive sleep apnea during outpatient follow-up.

At discharge, the patient's NIHSS score was 4, and he was referred for outpatient physiotherapy and further evaluation by hematology and neurology teams.

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3. Discussion

Stroke in young adults remains a diagnostic challenge because traditional vascular risk factors are frequently absent. Increasing evidence suggests that obstructive sleep apnea is an independent risk factor for cerebrovascular disease and may contribute significantly to stroke occurrence in younger populations.

The association between OSA and stroke is mediated through several mechanisms, including intermittent hypoxia, oxidative stress, sympathetic nervous system activation, systemic inflammation, and endothelial dysfunction. These processes promote vascular injury and thrombogenesis, thereby increasing the risk of ischemic stroke.

In the present case, the absence of conventional vascular risk factors combined with clinical features of OSA—including loud snoring, daytime somnolence, nasal speech, and tonsillar hypertrophy—suggests that sleep-disordered breathing may have contributed to the ischemic event. Repeated nocturnal hypoxia and hypercapnia may trigger systemic inflammation and increased blood viscosity, potentially leading to small-vessel occlusion and lacunar infarction.

The elevated hemoglobin and hematocrit levels observed in this patient may represent secondary polycythemia resulting from chronic intermittent hypoxia. Previous studies have demonstrated that obstructive sleep apnea may occur even in non-obese individuals, particularly when structural upper airway abnormalities such as tonsillar hypertrophy or craniofacial narrowing are present.

This case reinforces the importance of screening for obstructive sleep apnea in young patients presenting with ischemic stroke, particularly when conventional vascular risk factors are absent.

4. Conclusion

Early recognition and evaluation of sleep-disordered breathing in young stroke patients are essential to reduce recurrence risk and improve long-term outcomes. Multidisciplinary collaboration between neurology, respiratory medicine, and otorhinolaryngology specialists plays a critical role in the comprehensive management of such patients.

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