

INNOVATIVE DIAGNOSTIC AND THERAPEUTIC APPROACHES TO
OBSTRUCTIVE SLEEP APNEA SYNDROME (OSAS) IN ADULTS¹Melikulova Maftuna Sanatjonovna²Bekpo'latov Muxiddin Hakim o'g'li³Bo'riyev Shaxzod Saydullo o'g'li⁴Lapasov Mirsaid Xasan o'g'li^{1'2'3'4}Samarkand State Medical University

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Abstract. Obstructive Sleep Apnea Syndrome (OSAS) is a prevalent sleep disorder characterized by repetitive upper airway obstruction during sleep, resulting in hypoxia, fragmented sleep, and daytime somnolence. This study explores the latest diagnostic techniques and therapeutic options, emphasizing personalized treatment plans for adult patients.

Keywords: Obstructive sleep apnea syndrome, polysomnography, CPAP, oral appliances, sleep surgery, otorhinolaryngology.

Introduction:

OSAS affects 9–38% of the adult population and is associated with serious cardiovascular, metabolic, and neurocognitive consequences. The condition is underdiagnosed due to nonspecific symptoms such as loud snoring, excessive daytime sleepiness, and fatigue.

Early recognition and management are crucial for reducing morbidity and improving quality of life.

Pathophysiology:

OSAS results from anatomical and functional abnormalities leading to airway collapse during sleep. Contributing factors include obesity, craniofacial abnormalities, neuromuscular dysfunction, and altered arousal mechanisms. The repeated airway obstruction causes intermittent hypoxia, oxidative stress, and sympathetic nervous system activation.

Clinical Presentation:

Common symptoms include loud snoring, witnessed apneas, gasping during sleep, excessive daytime sleepiness, morning headaches, and impaired concentration. Physical examination may reveal obesity, large neck circumference, retrognathia, and nasal obstruction.

Diagnostic Modalities:

Polysomnography (PSG): The gold standard for OSAS diagnosis, measuring apnea-hypopnea index (AHI), oxygen desaturation, and sleep architecture.

Home Sleep Apnea Testing (HSAT): An accessible alternative for selected patients.

Upper Airway Endoscopy and Imaging: Identify anatomical sites of obstruction using drug-induced sleep endoscopy (DISE) and CT/MRI.

Therapeutic Approaches:

Lifestyle Modifications: Weight loss, positional therapy, and avoiding alcohol/sedatives.

Continuous Positive Airway Pressure (CPAP): First-line therapy providing pneumatic splinting of the airway.

Oral Appliance Therapy: For mild to moderate OSAS or CPAP intolerance.

Surgical Treatment: Includes uvulopalatopharyngoplasty (UPPP), maxillomandibular advancement, and hypoglossal nerve stimulation.

Materials and Methods:

A prospective cohort study involving 120 adult OSAS patients treated at the ENT Department of Samarkand State Medical University. Patients underwent comprehensive evaluation with PSG, DISE, and imaging. Treatment plans were individualized based on severity and anatomical findings. Outcomes were assessed using AHI reduction, symptom improvement, and quality-of-life questionnaires over 12 months.

Results:

CPAP therapy achieved symptom control in 70% of patients, with compliance challenges in 30%. Oral appliances improved symptoms in 50% of mild-to-moderate cases.

Surgical intervention was performed in 25% of patients, showing significant AHI reduction (average decrease from 35 to 10 events/hour) and improved daytime alertness. Drug-induced sleep endoscopy proved valuable for targeted surgical planning.

Discussion:

OSAS management requires a multidisciplinary approach, combining accurate diagnosis and tailored therapy. CPAP remains the gold standard, but alternative treatments are essential for noncompliant patients. Emerging surgical techniques and neurostimulation offer promising options. Patient education and follow-up enhance adherence and outcomes.

Conclusion:

Innovative diagnostic and therapeutic modalities enable personalized management of OSAS, reducing its systemic impact. Early diagnosis and individualized treatment improve patient quality of life and decrease associated comorbidities.

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