



OBSTRUCTIVE SLEEP APNEA SYNDROME IN ATHLETES: MODERN DIAGNOSTIC METHODS AND PREVENTION

Khamidjanov Sh.O

Republican Scientific-Practical Center of Sports Medicine, Tashkent.

Abstract. *Obstructive sleep apnea syndrome (OSAS) is a chronic sleep-related breathing disorder characterized by recurrent partial or complete obstruction of the upper airway during sleep. This condition can negatively affect sleep quality, physical recovery, cognitive function, and athletic performance. In athletes, adequate sleep is essential for physical and psychological recovery, adaptation to training, and maintenance of optimal performance. Therefore, early detection and prevention of OSAS are important components of modern sports medicine. Current diagnostic approaches include clinical screening, assessment of sleep quality, polysomnography (PSG), and home sleep apnea testing (HSAT). This article discusses the main risk factors for OSAS in athletes, modern diagnostic approaches, and preventive strategies.*

Keywords: *obstructive sleep apnea syndrome, athletes, sleep, polysomnography, home sleep apnea testing, screening, prevention, sports medicine.*

Introduction. Sleep plays an essential role in physical and psychological recovery, hormonal regulation, cognitive function, and adaptation to physical training. For athletes, adequate and high-quality sleep is particularly important because insufficient or disturbed sleep may negatively affect reaction time, concentration, recovery, and athletic performance.

Obstructive sleep apnea syndrome is characterized by repeated episodes of partial or complete upper-airway obstruction during sleep, resulting in intermittent hypoxia, sleep fragmentation, and impaired sleep quality. Although OSAS is commonly associated with obesity and metabolic disorders, it can also occur in physically active individuals and athletes.

The clinical symptoms of OSAS in athletes may be overlooked because daytime fatigue, reduced concentration, and decreased performance can easily be attributed to intensive training or insufficient recovery. Therefore, systematic screening for sleep-related breathing disorders should be considered as part of comprehensive sports medicine assessment.

Aim. The aim of this study is to review modern diagnostic approaches to obstructive sleep apnea syndrome in athletes and to identify effective preventive strategies aimed at early detection and reduction of risk factors.

Materials and Methods. The assessment of OSAS begins with a detailed sleep history and evaluation of symptoms such as habitual snoring, witnessed episodes of apnea, nocturnal choking or gasping, morning headaches, non-restorative sleep, daytime sleepiness, and unexplained fatigue.



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Screening questionnaires may be useful for identifying athletes at increased risk; however, questionnaires alone cannot establish a definitive diagnosis. According to the American Academy of Sleep Medicine (AASM), objective sleep testing with polysomnography or, in appropriately selected patients, home sleep apnea testing should be used to confirm the diagnosis. Polysomnography (PSG) remains the standard diagnostic method for evaluating sleep-related breathing disorders. During PSG, multiple physiological parameters are simultaneously recorded, including brain activity, eye movements, muscle activity, airflow, respiratory effort, blood oxygen saturation, heart rate, and body position.

Home sleep apnea testing (HSAT) can be used as an alternative diagnostic method in selected adults who have an increased probability of moderate-to-severe OSAS and do not have significant comorbid conditions. However, HSAT results should always be interpreted in conjunction with the patient's clinical history and examination. When an HSAT result is negative, inconclusive, or technically inadequate despite a high clinical suspicion of OSAS, polysomnography should be performed.

Prevention of Obstructive Sleep Apnea in Athletes. Prevention of OSAS in athletes should focus on early identification and modification of potentially preventable risk factors.

1. Maintaining adequate sleep duration and regularity. Athletes should maintain a consistent sleep-wake schedule and obtain sufficient sleep to support recovery and optimal physiological functioning. Sleep hygiene should be considered an integral part of training and recovery programs.

2. Maintaining an optimal body composition.

Excess body weight and obesity are important risk factors for OSAS. Regular assessment of body composition and appropriate nutritional and training strategies may help reduce the risk of sleep-disordered breathing.

3. Avoiding alcohol and inappropriate sedative use.

Alcohol and certain central nervous system depressants may increase upper-airway collapsibility and worsen obstructive breathing during sleep. Athletes should avoid alcohol before bedtime and should not use sedative medications without appropriate medical supervision.

4. Management of upper-airway and nasal disorders.

Chronic nasal obstruction, allergic rhinitis, structural abnormalities of the nasal passages, and other upper-airway disorders should be identified and appropriately managed. Improving nasal breathing may contribute to better sleep quality.

5. Appropriate sleeping position.

In some individuals, obstructive sleep apnea is more pronounced in the supine position. Positional therapy may therefore be considered in athletes with position-dependent OSAS when clinically appropriate.

6. Regular medical screening.

Sports medicine examinations should include questions regarding snoring, witnessed apnea, nocturnal breathing difficulties, excessive daytime sleepiness, morning headaches, and impaired recovery. Particular attention should be paid to athletes who experience



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unexplained reductions in performance despite an adequate training program. 7. Instrumental assessment of high-risk athletes.

Athletes with significant symptoms or a high clinical probability of OSAS should undergo objective sleep evaluation. Depending on the clinical situation, PSG or HSAT may be recommended. Early diagnosis allows timely treatment and may help prevent the negative consequences of chronic sleep-disordered breathing.

Results and Discussion

OSAS may remain undiagnosed in athletes because symptoms such as fatigue, impaired concentration, and daytime sleepiness can be interpreted as normal consequences of intensive physical training. Previous research has demonstrated that sleep problems and risk factors for sleep apnea are present even among highly trained athletes. In a study of elite athletes, poor sleep quality and clinically relevant daytime sleepiness were identified in a substantial proportion of participants. These findings emphasize the importance of incorporating sleep assessment into routine sports medicine practice.

The diagnosis of OSAS should not be based exclusively on symptoms or screening questionnaires. Objective testing is necessary to establish the diagnosis and determine disease severity. PSG provides comprehensive physiological monitoring and remains the reference standard, while HSAT may provide a convenient alternative for appropriately selected patients. From a preventive perspective, maintaining adequate sleep, controlling body composition, treating upper-airway disorders, avoiding alcohol and inappropriate sedative medications, and conducting regular screening may contribute to reducing the clinical consequences of sleep-disordered breathing in athletes.

Conclusion. Obstructive sleep apnea syndrome is an important but potentially underrecognized condition among athletes. High physical fitness does not completely exclude the possibility of OSAS. Because sleep quality is closely related to recovery, cognitive function, and athletic performance, early identification of sleep-disordered breathing should be considered an important component of sports medicine. Polysomnography remains the standard diagnostic method, while home sleep apnea testing can be used in appropriately selected individuals. Effective prevention should include regular sleep assessment, adequate sleep hygiene, maintenance of optimal body composition, management of upper-airway disorders, avoidance of alcohol and inappropriate sedative medications, and timely referral for objective sleep testing.

The integration of OSAS screening and preventive strategies into routine sports medicine examinations may contribute to better health, recovery, and performance among athletes.

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