



SEPAR Guidelines

Diagnosis and treatment of sleep apnea-hypopnea syndrome

Diagnóstico y tratamiento del síndrome de apneas-hipopneas del sueño

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Introduction

After the last recommendations of the Spanish Society of Pulmonology and Thoracic Surgery (SEPAR) for the diagnosis and treatment of sleep apnea-hypopnea syndrome (SAHS) published in 1998 and the National Consensus Document on SAHS (in Spanish, DCNSAHS) by the Spanish Sleep Group (in Spanish, GES) in 2005, the intention of the current guidelines is to use the best evidence available to update the recommendations for the diagnosis and treatment of SAHS. SAHS is defined as an altered

apnea-hypopnea index (AHI > 5), accompanied by at least by snoring and/or witnessed apnea. The Grade system¹ has been followed (table 1) in order to establish recommendations (consistent or weak) depending on the quality of the evidence (high, moderate, low or very low) of the studies found in the literature.

The guidelines have been structured into 8 topics dealing with the definition, epidemiologic aspects, clinical aspects (including cardiovascular complications due to its special implication in making therapeutic decisions), diagnostic methods and treatment. In accordance with the evidence derived from recent, solid cohort studies demonstrating an increase in cardiovascular morbidity and mortality in SAHS patients, especially in those with AHI \geq 30, these guidelines accept an AHI

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Table 1
Classification of the recommendations and quality of evidence according to the Grade system¹

Grade of recommendation	Quality of evidence	Implications
Consistent recommendation; ^a high quality of evidence	Well-done RCT, or exceptionally well done OS	Can be applied in most patients under most circumstances
Consistent recommendation; ^a moderate quality of evidence	RCT with limitations, or well done OS with important effects	Can be applied in most patients under most circumstances
Consistent recommendation; ^a low quality of evidence	Evidence for at least one important result of an OS, or RCT with important defects or very indirect evidence.	May change when evidence becomes available
Consistent recommendation; ^a very low quality of evidence	Evidence for at least one important result of non-systemic clinical observations or very indirect evidence	May change when greater evidence becomes available
Weak recommendation ^b ; high quality of evidence	Well-done RCT or exceptionally well-done OS	May differ depending on the circumstances or the patients
Weak recommendation; ^b moderate quality of evidence	RCT with limitations, or well-done OS with important effects	Other alternatives may be better for some patients under certain circumstances
Weak recommendation ^c ; low quality of evidence	Evidence for at least one important result of OS, or RCT with important defects or indirect evidence	Other alternatives may be equally reasonable
Weak recommendation; ^d very low quality of evidence	Evidence for at least one important result of OS, or RCT with important defects of indirect evidence	Other alternatives may be equally reasonable

OS: observational studies; RCT: randomized clinical trials.

^aThe benefits clearly outweigh the drawbacks, or vice-versa.

^bThe benefits are in balance with the drawbacks.

^cUncertainty in the estimation of the benefits or drawbacks; the benefits may be in balance with the drawbacks.

^dMajor uncertainty in the estimation of the benefits or drawbacks; the benefits may or may not be in balance with the drawbacks.

≥ 30 as criteria for treatment, even in patients with few symptoms.

Obesity hypoventilation syndrome and Cheyne-Stokes respiration are sleep respiratory disorders that are frequently associated with SAHS, and are therefore reviewed in these guidelines. A chapter is dedicated to SAHS in children, whose diagnosis and prevalence are increasing, which will cause an increase in the activity of Sleep Units. Finally, we deal with the risk of accidents and the difficulty inherent in the concession and renovation of drivers' licenses in SAHS patients.

Concept, Definitions, Severity, Pathogenesis and Epidemiology

The National Consensus Document on SAHS in 2005 defined SAHS as a combination of "symptoms including excessive

sleepiness and cognitive-behavioral, respiratory, cardiac, metabolic or inflammatory disorders secondary to repeated episodes of upper airway obstruction (UAO) during sleep² (consistent degree of recommendation, high quality of evidence). These episodes are measured with the apnea-hypopnea index (AHI) (table 2). An AHI > 5 associated with symptoms related with the disease and unexplained by other causes confirms the diagnosis² (consistent degree of recommendation, low quality of evidence). This definition is controversial. Considering an AHI > 5 as abnormal is arguable and it is probable that the threshold for abnormality differs, relating with sex and age (consistent recommendation, low quality of evidence). Moreover, the association of SAHS with excessive daytime sleepiness (EDS) was established arbitrarily.

EDS is an easily-measured symptom that is quite prevalent among the general population,^{3,4} therefore AHI > 5 and EDS are,

Table 2
Accepted definitions for the main respiratory events, recommended by the National Consensus Document on sleep apnea-hypopnea syndrome

Obstructive apnea	Absence or reduction > 90% of the respiratory signal (thermistors, nasal cannula or pneumotachography) for > 10 seconds in presence of respiratory effort detected by thoracoabdominal movement
Central apnea	Absence or reduction > 90% of the respiratory signal (thermistors, nasal cannula or pneumotachography) for > 10 seconds in absence of respiratory effort detected by thoracoabdominal movement
Mixed apnea	A respiratory event that usually begins with a central component and ends with an obstructive component
Hypopnea ^a	A discernible reduction (> 30% and < 90%) in the width of the respiratory signal of > 10 seconds or an evident reduction in the thoracoabdominal result accompanied by desaturation (≥ 3%) and/or micro-arousal on EEG
Respiratory effort-related arousals (RERA)	Period > 10 seconds of progressive increase in respiratory effort (ideally detected by a progressive increase in esophageal pressure that ends with a micro-arousal (no evident reduction in flow – hypopnea criterion-). It can also be detected by short periods of flow limitation – flattening of the signal from the nasal catheter or reduction in the thoracoabdominal sum accompanied by micro-arousal)
Apnea-hypopnea index (AHI) ^b Respiratory disturbance (RDI) ^b	Sum of the number of apneas and hypopnea (the most frequently used parameter to evaluate the severity of sleep respiratory disorders. It is the number of apneas + hypopneas + RERA per hour of sleep (or per hour of tracing if respiratory polygraph is used). RDI is <i>Respiratory Disturbance Index</i> , as found in the literature
Definition of SAHS: SAHS = 1 + (A or B)	1. RDI > 5 associated with one of the following symptoms A. Excessive daytime sleepiness (ESD) unexplained by other causes B. Two or more of the following B1. Repeated asphyxia during sleep B2. Recurring arousals during sleep B3. Perception of sleep as non-restful B4. Tiredness and/or fatigue during the day B5. Difficulties for concentrating

Modified reproduction, with the permission of the Spanish Sleep Group (GES).¹ Definition of SAHS according to the American Academy of Sleep Medicine.²

^aThere is no well-contrasted definition of hypopnea, and there is no universal consensus for its definition; ^bfrom a practical point of view, AHI and RDI can be considered superimposable terms. In other words, RERA are included with hypopnea.

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