Undiagnosed Cases of Obstructive Sleep Apnoea Syndrome: A New Reason for Involvement of Otorhinolaryngologists

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Introduction: In Spain there are around 2 million people with obstructive sleep apnoea syndrome who should be treated. However, less than 10% have been diagnosed and treated. Untreated patients are associated with a higher risk of cardiovascular and neurological complications, higher accident rates, reduced quality of life, and greater healthcare consumption. It is necessary, therefore, to reduce these consequences through early diagnosis and treatment.
Objective: To demonstrate the usefulness of a simple series of questions and examination as a mechanism to detect patients with undiagnosed obstructive sleep apnoea syndrome, in a consultation with a general otorhinolaryngologist.
Material and method: Five hundred two consecutive patients coming to an otorhinolaryngological consultation for reasons other than sleep pathology were submitted to a series of questions and an examination of upper aerodigestive tract, to search for indications of suspected sleep apnoea. For the different clinical and anatomical comparisons, a control group of 178 consecutive already-diagnosed patients was used.
Results: Of the 502 cases, 74 (14.7%) fulfilled the requirements for suspicion and 35 of them agreed to take a polysomnograph test (47.29%). Of this group, an apnoea/hypopnoea index greater than 5 was found in 24 of the 35 cases (4.78%).
Conclusions: The prevalence of obstructive sleep apnoea in the group of patients studied is greater than that of the general population. With a simple interview and physical examination, a high rate of success can be obtained in the detection of undiagnosed sleep apnoea cases.

Key words: Obstructive sleep apnoea syndrome. Otorhinolaryngology. Undiagnosed cases of obstructive sleep apnoea syndrome. Examination of upper aerodigestive tract.

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Casos no diagnosticados de síndrome de apnea obstructiva del sueño: un nuevo motivo de implicación para el otorrinolaringólogo

Introducción: En España hay alrededor de 2 millones de sujetos portadores de un síndrome de apnea obstructiva del sueño subsidiarios de tratamiento. Sin embargo, tan sólo se ha diagnosticado y tratado menos del 10%. Los pacientes no tratados tienen un riesgo superior de complicaciones cardiovasculares y neurológicas, mayor accidentabilidad, reducción en calidad de vida y mayores consumos sanitarios. Es necesario, por tanto, reducir estas consecuencias mediante un diagnóstico y un tratamiento precoces.
Objetivo: Demostrar la utilidad de un interrogatorio y una exploración sencillos, como mecanismo de detección de pacientes con síndrome de apnea obstructiva del sueño no diagnosticado, en una consulta de otorrinolaringología general.
Material y metodo: A 502 pacientes consecutivos, que acuden a la consulta de otorrinolaringología por un motivo diferente de patología de sueño, se los somete a un interrogatorio y la exloración de vías aerodigestivas altas en busca de criterios de sospecha de apnea del sueño. Los casos con sospecha clínica son invitados a realizar una polisomnografía nocturna. Para las diferentes comparaciones clínicas y anatómicas se ha utilizado un grupo control de 178 pacientes consecutivos ya diagnosticados.
Resultados: De los 502 casos, 74 (14,7%) cumplen los requisitos de sospecha y 35 (47,29%) de ellos acceden a la práctica de la polisomnografía. En este último grupo se obtuvo un índice de apnea/hipopnea (IAH) superior a 5, en 24 de los 35 casos (4,78%).
Conclusiones: La prevalencia de apnea obstructiva del sueño en el grupo de pacientes analizados es superior a la de la población general. Con un sencillo interrogatorio y la exploración física, se puede obtener un alto rendimiento en la detección de casos no diagnosticados de apnea del sueño.

Palabras clave: Síndrome de apnea obstructiva del sueño. Otorrinolaringología. Casos no diagnosticados de apnea obstructiva del sueño. Exploración de vías aerodigestivas superiores.

INTRODUCTION

Obstructive sleep apnoea syndrome (OSAS) is a condition known for little over 50 years and with an increasingly evident clinical and social impact.[1,2] The accepted incidence figures are 2% among adult women and 4% among males.[3] In Spain there are between 1 200 000 and 2 150 000 subjects suffering from relevant OSAS, and are therefore candidates for treatment.[4] A study by the group of pneumologists in Zaragoza estimates that the incidence in our country may be around 0.8% among women and 2.2% among men.[5]

Despite this, only 5%-9% of this population has been diagnosed and treated,[4] so we are very far from reaching an optimal situation.[1] This problem affects not only Spain. Thus, the fact of having diagnosed less than 10% of people with OSAS has also been found in other studies beyond our environment.[6,7]

Several epidemiological studies have demonstrated the high prevalence of undiagnosed OSAS and its relationship with a significant increase in morbidity and mortality.[8,9] Patients with untreated OSAS have a higher risk of cardiovascular[10,11] and neurological[12] complications, a higher rate of traffic or work-related accidents,[1,2,13] higher anaesthetic risk,[1,14] and worse quality of life.[15-17]

The increase of resource consumption caused by an untreated OSAS patient has also been amply demonstrated.[18] Some studies, conducted in the United States, estimated that undiagnosed cases of moderate or severe OSAS could pose an additional medical cost of 3.4 billion dollars.[19]

Therefore, it is necessary to reduce these consequences through early diagnosis and treatment.[8] The speciality of otolaryngology should always be aware of the progress and contributions in this condition. We know that the origin of the syndrome is located in the upper aerodigestive tract (UA) and the knowledge of diagnostic methods and treatment of this anatomical region are mostly characteristic of this speciality.[20]

Otolaryngology has had a prominent role in the evolution of the knowledge of this disease. In just 50 years, the progress in all aspects of this condition has been spectacular and in many cases the otolaryngology community has participated actively.[20]

In our clinics we can discover many cases of as yet undiagnosed OSAS and collaborate evidently in reducing the number of risk patients yet to be discovered. This will help prevent the harmful consequences of untreated cases due to ignorance by the patient or the first-line professionals.[20]

We present a prospective study which investigates the percentage of patients who suffer from OSAS without knowing it, among a group of patients who come to a first line otolaryngology clinic for reasons other than sleep breathing disorders. The intention is to demonstrate the usefulness of a simple questioning and examination by an otolaryngologist as a mechanism for detecting patients with undiagnosed OSAS.

MATERIAL AND METHOD

Between November 2006, and March 2007, all patients attending the otolaryngology clinic for a reason other than a sleep breathing disorder, who did not have a history of diagnosis or treatment of this disease, were prospectively recruited. The age limits established were 18-80 years.

In all these cases, following the clues given by the reason for the consultation, the patients were questioned on OSAS following the methodology implemented in our department.

This history is focused towards symptoms of sleep respiratory disorders and applies the Epworth scale[21] to determine the degree of drowsiness. It uses a personal grading system on these symptoms which has been published previously (Table 1).[22]

Subsequently, a basic UA examination is performed as usual on patients with clinical signs of OSAS. This examination, always conducted by the same examiner, includes anterior rhinoscopy, oropharyngoscopy, assessment of retromicrognathia, Friedman lingual grading, and flexible endoscopy (Table 2). For different statistical surveys the examination is considered positive or altered when the gradation observed is 1 or 2 and not altered when it is 0.

a e 1. linical Grading of the Intensity of noring, Apnoea, and Daytime leepiness

noring	
0	o snoring
1	nores occasionally, with low intensity, not every night, depending on the circumstances (fatigue, alcohol)
2	nores every night, with considerable intensity, sometimes wa es partner
3	nores very intensely, can be heard from other rooms, even neighbours, wa es him herself up with the noise
Apnoea	
0	Does not suffer apnoeas
1	ome nights, depending on the circumstances (fatigue, alcohol, etc), or maybe every night but only isolated and or very short
2	Every night, various times each night and or moderate length, the partner is worried and is even afraid some nights
3	Apnoeas every night, very frequent, and or prolonged, the partner is very afraid and or the patient has wo en very flushed
leepiness	
0	o daytime sleepiness
1	Minimum or moderate sleepiness, only after lunch or dinner, at night while watching television; related to fatigue or not sleeping enough (EE 10)
2	Moderate considerable sleepiness, almost daily, in activities which require little concentration or are monotonous (conferences, driving on a highway, reading, etc) (EE 10 and 21)
3	erious and dangerous sleepiness, falls asleep continuously, and while performing activities requiring attention: wor ing, city driving (EE 21)

a e 2. Grading of the E amination of the pper Aerodigestive Tract

Anterior rhinoscopy	
Grade 0	ull view of the nasal vestibule and middle cornet
Grade 1	Occlusion of vestibular view 50% and or the medium cornet is partially visible
Grade 2	Occlusion of vestibular view 50% and or the middle cornet can not be seen
Oropharyngoscopy	
Grade 0	Oral opening permits view of the entire posterior pharyngeal wall. ength of the palate-posterior pharyngeal wall 1 cm. Evident separation of the palate and the base of the tongue. vula 1 cm diameter and does not touch the base of the tongue. The tonsils occupy less than 50% of the distance between pillars and midline. Without palatal hypertrophy (0.2 cm thic ness and 3 cm length)
Grade 1	Oral opening permits view of the bottom edge of the soft palate and the posterior wall of the pharyn . Distance between palate-posterior wall 1 cm. Tonsil hypertrophy occupying more than 50% of the distance between pillars and midline. vula larger than 1.5 cm in diameter and or long uvula resting on the base of the tongue. Moderate narrowing (50%-75% reduction of vision of the posterior wall) of lateral soft tissue (posterior pillars or webs). Moderate palatal hypertrophy, length: 3-4 cm and or thic ness: 0.2-0.5 cm
Grade 2	Oral opening does not permit view of the lower edge of soft palate by low implantation or hypertrophy of the base of the tongue. oft palate which contacts with the posterior wall. Tonsil hypertrophy touching midline. ignificant narrowing (reduction in the view of the posterior wall 75%) by soft lateral parts (posterior pillars or webs). onsiderable palatal hypertrophy: length 4 cm and or thic ness 0.5 cm.
riedman grades of tongue occupation	
Grade 1	View of soft palate, gorge, uvula, and pillars
Grade 2	Partial view of soft palate, gorge, and uvula. The uvula is in contact with the base of the tongue
Grade 3	View of the soft palate and base of the uvula
Grade 4	View of the hard palate and nothing else
ibronasolaryngoscopy	
Rhinopharyn (evaluates the occupation by lateral soft tissue or space-occupying mass):	
Grade 0	Occupation 50%
Grade 1	Occupation of 50%-75%
Grade 2	Occupation 75%
Retropalatal (evaluates the narrowing of the region in relation with the diameter of the fiberscope):	
Grade 0	The fiberscope can be passed easily without touching any wall
Grade 1	Very difficult to pass the region with the fiberscope without touching the walls
Grade 2	Anterior and posterior walls in total contact during paused breathing
Retrolingual (evaluates the narrowing of the region with regard to the structures that can be seen from a cranial view with the fiberscope):	
Grade 0	All anatomical pharyngolaryngeal structures can be seen widely and with no difficulty
Grade 1	The valleculae can not be seen but a large percentage of the glottis can, without reaching the anterior opening and or moderate reduction of the light by the lateral walls (limiting the view of pyriform sinuses)
Grade 2	The valleculae cannot be seen and the epiglottis touches the posterior wall of the pharyn or only the posterior opening of the laryn can be seen and or severe reduction of light by lateral walls (with no view of the aryteno-epiglottic folds)

To assess retrognathia or micrognathia, it is considered normal if the medial cusp of the first upper molar fits with the valley of the first lower molar. When the valley of the first lower molar is posterior to the cusp of the upper one, it is considered to be retrognathia.

In cases with suspected OSAS, a nocturnal polysomnograph (PSG) is suggested. The clinical criterion for considering them candidates for such an examination has been that the 3 degrees of snoring, apnoea, and sleepiness were at least 1 or that any of these 3 grades was higher than 1.

For the different clinical and anatomical comparisons, a control group of 178 consecutive patients already diagnosed with OSAS and corresponding to a protocol for diagnosis, and treatment with proton pump inhibition has been used.

Statistical Study

The mean (standard deviation) summarizes the quantitative variables and the percentages summarize the qualitative variables. When the dependent variable is quantitative and the independent categorical binary, the test

used is the Student-Fisher *t* test for repeated measurements. In groups with fewer than 30 members, normalcy was checked using the Shapiro Wilk test. For the comparison of qualitative variables, the test used was Pearson's χ^2 test and Fisher's exact test. A *P* value ≤.05 was considered significant.

RESULTS

Epidemiology and Clinical Data of the Study Group and the Control Group

A total of 502 consecutive patients were recruited to the study group, all of whom accepted a questionnaire on sleep respiratory symptoms and an UA examination. The various reasons for consultation in this population were: involvement or clinical signs in external and middle ear in 139 cases (27.7%), of the inner ear in 124 cases (24.7%), sinonasal disorders in 122 cases (24.3%), pharyngolaryngeal in 110 cases (21.9%), and cervical in 7 cases (1.4%).

The relationship of epidemiological and clinical data for the study and control populations is shown in Table 3. With the exception of age, which is similar in both populations, the rest of the parameters reveal statistically significant differences: In the control group of patients diagnosed with sleep breathing disorders, we see a higher percentage of males, higher body mass index (BMI), and more toxic habits, compared with the study group.

Logically, the control group also shows, in a statistically significantly manner, a greater percentage of patients with snoring, apnoeas observed, and excessive daytime sleepiness.

Clinical Aspects of Sleep Breathing Disorders in the Study Group

Of the 502 cases in the study group, 74 (14.7%) met the requirements for consideration of suspected sleep breathing disorder. These 74 cases were advised to take a PSG and 35 of the 74 cases (47.29%) agreed to carry out the test.

The average apnoea/hypopnoea index (AHI) for the 35 cases was 15.63 (22.40), with extremes of 0-85. An AHI greater than 5, considered as the limit for diagnosing OSAS,[1] was obtained in 24 of 35 cases, representing 68.6% of the cases with clinical criteria of suspected OSAS and 4.78% of the entire population under study. In 5 of 35 cases (14.3%), the AHI was ≥30, which could be considered as severe OSAS (1% of the study population).

When comparing the clinical and epidemiological data among patients who meet the criteria for clinical suspicion of sleep breathing disorders and those who fail to do so, we note that the first group displayed a higher percentage of men with a greater BMI and higher consumption of alcohol. The age in this group is also statistically higher than that of the group of patients who do not meet these criteria (Table 4). However, when the same comparison is verified between the group of patients who meet the clinical criteria for suspicion and the control group of patients already diagnosed with OSAS, the only statistically significant difference was that the average age was higher in the first group (Table 5).

This same table also compares the differences between the 3 basic symptoms of sleep disordered breathing between both populations. No difference between snoring and excessive daytime sleepiness was observed. However, in the control group of patients already diagnosed with this condition, there is a significantly greater percentage of patients whose partners reported nocturnal apnoeas (Table 5).

a e 3. tudy Group and ontrol Group. linical and Epidemiological Data[a]

Parameter	*tudy Group (n 502)*	*ontrol Group (n 178)*	*P*
Age, mean (D), y	49.38 (16.295)	49.53 (11.54)	
Males	253 (50.4%)	143 (80.3%)	.000
ody mass inde	25.60 (3.89)	28.21 (4.13)	.000
mo ers	97 (19.3%)	55 (30.9%)	.001
Alcohol drin ers	89 (17.7%)	55 (30.9%)	.001
noring	302 (60.2%)	177 (99.4%)	.000
Apnoeas observed	50 (10%)	135 (75.8%)	.000
Daytime sleepiness	109 (21.7%)	109 (61.3%)	.000

[a] indicates not significant.
The data is presented as n (%) or average (standard deviation).

a e 4. linical Differences in the tudy Group etween Those Who ulfil the riteria (Offered Polysomnography) and Those Who Do ot[a]

Parameter	*Do ot ulfil riteria (n 428)*	*ulfil riteria (n 74)*	*P*
Age, mean (D), y	48.43 (16.427)	54.84 (14.435)	.001
Males	202 (47.2%)	51 (68.9%)	.000
ody mass inde	25.18 (3.71)	28.01 (4.07)	.000
mo ers	77 (18%)	20 (27%)	
Alcohol drin ers	67 (15.6%)	22 (29.8%)	.013

[a] indicates not significant.
The data is presented as n (%) or average (standard deviation).

a e . linical Differences etween Those Who ulfil riteria for leep reathing Disorder and the ontrol Group[a]

Parameter	*ontrol Group (n 178)*	*ulfil riteria (n 74)*	*P*
Age, mean (D), y	49.53 (11.542)	54.84 (14.435)	.006
Males	143 (80.3%)	51 (68.9%)	
ody mass inde	28.21 (4.132)	28.01 (4.07)	
mo ers	55 (30.9%)	20 (27%)	
Alcohol drin ers	55 (30.9%)	22 (29.8%)	
noring	100%	100%	
Apnoeas observed	75.8%	55.4%	.012
Daytime sleepiness	61.2%	63.5%	

[a] indicates not significant.
The data is presented as n (%) or average (standard deviation).

a e . Anatomical Alterations, omparison etween the tudy Group and the ontrol Group

Anatomical Alteration	*tudy Group (n 502)*	*ontrol Group (n 178)*	*P*
Alteration in rhinoscopy	302 (60.2%)	126 (70.8%)	.009
Alteration in oropharyngoscopy	301 (60%)	121 (67.9%)	.005
Retrognathia micrognathia	141 (28.1%)	54 (30.5%)	
riedman lingual grades 3-4	35 (7%)	84 (50.9%)	.000
Endoscopic alteration in rhinopharyn	9 (1.9%)	17 (9.5%)	.001
Retropalatal endoscopic alteration	220 (43.8%)	134 (75.3%)	.000
Retrolingual endoscopic alteration	148 (29.5%)	113 (63.5%)	.000

a e Anatomical Alterations, omparison etween the Groups With and Without linical riteria for uspecting leep-Disordered reathing[a]

Anatomical Alteration	*With O A riteria (n 74)*	*Without O A riteria (n 428)*	*P*
Alteration in rhinoscopy	49 (66.2%)	253 (59.1%)	
Alteration in oropharyngoscopy	61 (82.4%)	240 (56.1%)	.000
Retrognathia micrognathia	36 (48.6%)	105 (24.5%)	.000
riedman lingual grades 3-4	26 (35.1%)	9 (2.1%)	.000
Endoscopic alteration in rhinopharyn	4 (5.7%)	5 (1.2%)	
Retropalatal endoscopic alteration	58 (82.9%)	162 (39.3%)	.000
Retrolingual endoscopic alteration	50 (72.5%)	98 (23.8%)	.000

indicates not significant; O A : obstructive sleep apnoea syndrome.

Data From the Anatomical Examination of the UA

The results of the comparative statistical study between the study group and the control group of anatomical abnormalities obtained from the UA examination are shown in Table 6. This analysis shows that there are statistically significant differences in all anatomical areas studied, with the exception of retromicrognathia. In all of them, there is a greater proportion of cases with altered UA in the control group.

If the same comparison is done with the examination of UA in the study group, comparing patients with clinical criteria for suspicion and those who did not present these criteria, the resulting data are shown in Table 7. With the exception of the anterior rhinoscopy and rhinopharyngeal endoscopic obstruction, the other examinations are more altered to a statistically significantly degree in the group with clinical criteria of sleep breathing disorders.

DISCUSSION

OSAS could affect up to 10% of professionally active men[23] and various studies have shown that more than 90% of men and over 80% of women, supposedly suffering from the condition have not yet been diagnosed.[6,16] The delay in diagnosis, and therefore the start of effective treatment, can have serious medical and social consequences.[1,16,23,24]

The relationship of OSAS with systemic diseases which can affect the future of an individual is already known.[23,24] OSAS has been linked with essential arterial hypertension,[25,26] as considered a risk factor for cardiovascular alterations,[10,11,27] or as a predisposing factor for cerebrovascular accidents.[12,28]

Although there are no case-control studies available to confirm an increased peri-operative risk for patients with OSAS, there is ample evidence indicating that this risk is higher in these patients.[29,30] Several studies have shown that OSAS is aggravated by the effects of anaesthetic sedation. On the other hand, anatomical abnormalities of the UA, typical in many of these patients, are an important condition in intubation.[1,31]

Drugs used in anaesthesia, in addition to the depression of skeletal muscle tone, increase the reduction of the phased activity of the intercostal and accessory muscles, making the activity even more dependent on the diaphragm and increasing the imbalance in favour of negative pressures on the UA.[1,30]

Another social impact resulting from not diagnosing or treating OSAS refers to the likelihood of injury. Since the high rate of traffic accidents in patients with OSAS was first demonstrated in the nineteen-eighties,[32] multiple studies have confirmed these results in subsequent years.[33-35] The relative risk of these patients with regard to the general population varies depending on the work consulted between 2:1 and 7:1, and reaches a relative risk of 11:1 if OSAS and driving is also joined by the intake of small quantities of alcohol.[33-35]

We must not forget the costs posed by traffic accidents related to OSAS. A study by Sassani et al,[36] analyzed the cost of the deaths and traffic accidents related to OSAS in the United States during 2000. The study estimated that during that year there were 810 000 OSAS-related accidents, and their cost would be around 15 900 million dollars and 1400 lives. The treatment of these drivers with continuous positive nasal pressure would have cost 3180 million dollars, saved 11 100 million dollars and 980 lives.

Work-related accidents have become a social problem of great magnitude. Many of these accidents commonly occur together with daytime sleepiness. Thus patients with OSAS,

especially if it has not been diagnosed and treated, are subject to an increased risk of accidents at work and in the home.[1]

In the light of all these data, it becomes clear that early diagnosis and treatment of OSAS, and thus the reduction in the number of undiagnosed patients, is a key issue from a medical, professional, economic, and social point of view. Undiagnosed OSAS means a doubling of medical expenses during the years in which it is not diagnosed. From the point of view of the patients, OSAS means deterioration in their quality of life. Its treatment improves these aspects, prevents sequelae, morbimortality, and reduces health expenses.[15,17]

If we solve this problem through early and more extensive diagnosis of the affected population, we are faced with another: the shortage of health resources.[1] The sleep units available in Spain, despite having tripled in number over the past 9 years,[4,37,38] are not sufficient and are not adequately equipped to meet this growing demand, leading to unacceptable waiting lists, which sometimes reach 1 year or more before a sleep test is conducted.[39]

To try to remedy this lack of resources, various abbreviated techniques have been developed for polysomnographic recording[1] and multiple clinical questionnaires have been designed that, in addition to selecting the best candidates to utilize those resources, collaborate heavily in resolving the problem of undiagnosed OSAS.[16,40,41] Outstanding among these questionnaires is the famous Berlin questionnaire designed at the Sleep in Primary Health Care Conference held in Berlin and confirmed as useful by later studies.[42]

These screening systems by application of questionnaires and simple physical examinations must be conducted at the level of primary health-care, but with the support of an operational functional network allowing adequate flows.[1,24] Within this diagnostic network, there are a number of specialists in fields other than front-line medicine, including anaesthetists[1,30] or dentists,[43] who can each work in their own area, and in the light of their know-how, to reduce rates of underdiagnosing. It is clear that otolaryngology should be at the head of this group of specialities.

An editorial in this magazine in 2005 noted the historic significance of our speciality in the development of the knowledge of OSAS and the role it should play in the future.[20] In our clinics we can discover many cases of still undiagnosed OSAS and collaborate on a clear reduction in the number of patients at risk yet to be discovered. This will help prevent the harmful consequences of the cases of sleep apnoea due to ignorance of the patient or front-line professionals.[20]

The present study shows the percentage of cases who are unaware of suffering OSAS and can be identified simply without a large increase in the time spent on consultation. Of the 502 cases studied who came to this clinic for reasons other than sleep disordered breathing, about 15% (74 patients) showed indicative clinical signs. Of these 74 cases, 35 agreed to a study with PSG, and 4.78% had an AHI greater than 5. In other words, almost 5% of the study population had sleep apnoea shown by PSG and susceptible to treatment and only 1% of the general population had a serious condition.

These figures for OSAS prevalence are somewhat higher than those found for the general population, both in Spain and internationally.[3,5] It is also noteworthy that the percentage of snorers in the study population, approximately 50%, was significantly high compared with the figures for the general population.[3] That is to say, in a population with general otolaryngological problems, there is a significant prevalence of patients with sleep breathing disorders.

The otolaryngology specialist can easily detect undiagnosed OSAS through simple, speedy questioning, and physical examination, without excessively increasing the time required for consultation. On the other hand, this study shows that the result of this anamnesis is high: of the 35 clinically suspected cases agreeing to a PSG, OSAS was confirmed in 68.6% of the cases.

When we compare the 3 main symptoms of OSAS between the group of patients who meet criteria for clinical suspicion of sleep breathing disorder and a control group of patients already diagnosed with this disorder, the percentages of snorers and cases of excessive daytime sleepiness (EDS) are similar. A higher percentage is only observed in the control group in the case of patients for whom the partner has evidenced nocturnal apnoea. This differential finding is probably explained because the nocturnal apnoeas observed are one of the main reasons persuading patients to go to a specialist when their partner discovers it.

In order to suspect sleep breathing disorder, the guidance value of specific epidemiological aspects should also be noted. Both male gender and a high BMI or toxic habits, in particular alcohol, are factors which in this study are shown as most prevalent in cases with diagnosed (control group) and suspected OSAS (cases with positive clinical criteria for suspicion).

Other authors have already pointed out the role that could be played by otolaryngology specialists in this aspect. Teculescu et al[44] indicate that simple questioning, anthropometric measurements, and basic tests of otolaryngology examination are easy to carry out and easily accepted by volunteers, and they can contribute to the early diagnosis of patients at risk.[44] In addition, otolaryngology clinics often receive many patients who only report snoring and the specialist is trained and required to separate the cases where there is also underlying OSAS.[45,46]

The examination of the upper airway is largely the territory of otolaryngology and there is no other speciality which knows it better.[20] It is important to carry it out before starting any treatment for a patient with OSAS.[20,47] There are reasonable doubts over an alleged correlation between anatomic abnormalities in the UA and the degree of seriousness of the OSAS.[47,48]

This study demonstrates, with statistical significance, a greater change in the examinations of the UA when comparing the control group and the whole study group and when comparing the cases with and without criteria for clinically suspected sleep breathing disorder. In a

prospective study in which they compared 100 patients without OSAS and 223 patients with diagnosed OSAS, Zonato et al[49] showed significant differences in the examination of the latter in terms of Mallampati's classification, tonsil hypertrophy, and other skeletal parameters.[49] Pang et al[16] also found these differences when applying the Friedman grading to tongue position.

In conclusion, there is a high percentage of patients with undiagnosed OSAS and who will therefore not receive proper treatment at an early stage. The consequences of this delay in diagnosis and treatment have been shown to be negative from the medical, social, and economic viewpoints.

The otolaryngologist has the knowledge and resources to collaborate very effectively in reducing the number of patients who have OSAS and have not yet been diagnosed. This is one more argument for the involvement and recognition of our speciality in the comprehensive approach to this disease.

The examination of the UA is a simple job for the otolaryngologist and fundamental for the diagnosis of patients with OSAS, which will also help to project a better targeted subsequent treatment.

The prevalence of OSAS in the group of otolaryngology patients analyzed is somewhat larger than that for the general population. With interrogation and physical examination which are easy for the specialist, we can obtain a great diagnostic performance. The small increase in time which it might require for our consultations is compensated, in our view, by the benefit that is provided both to patients who were unaware of their condition and to society in general.

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