Role of Otorhinolaryngology in Sleep Breath Disorder´s Publications

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Introduction: Respiratory sleep disorders represent one of the most multidisciplinary pathologies in medicine today. Many specializations are involved and otorhinolaryngology figures prominently amongst them. Lately there is an impression of a certain lack of interest in coming to grips with these disorders on the part of otorhinolaryngologists.
Objective: To attempt to study objectively the level of participation of otorhinolaryngologists in scientific publications on respiratory sleep disorders.
Material and method: Two bibliographic databases were reviewed, one national (Índice Médico Español [the Spanish medical index]) for the years 1997 to 2006, and one international (MEDLINE) for the years 2001 to 2006. The publications of *Acta Otorrinolaringológica Española* are also reviewed for the period between 2001 and 2006.
Results: Otorhinolaryngology publications rank second in the Spanish medical index with 27 out of 191 (13.56 %) and in MEDLINE they come in third with 919 out of 7011 (12.04 %). The level of collaborations with the participation of otorhinolaryngologists is low: they participate in 2.35 % of all publications with more than one specialization and 3.15 % of the publications presented by otorhinolaryngologists are collaborations. In *Acta Otorrinolaringológica Española*, respiratory sleep disorders appear infrequently (14/566 [2.47 %]). By countries, Spain comes in eighth in MEDLINE, with 286 publications by all specializations and sixth with 27 publications written by otorhinolaryngologists.
Conclusions: From the perspective of scientific publications, otorhinolaryngology continues to occupy an important position in terms of the level of participation; however, the level of collaboration with other specializations is low and must be strengthened.

Key words: Publications. Otolaryngology. Respiratory sleep disorders.

Participación de la otorrinolaringología en las publicaciones sobre los trastornos respiratorios del sueño

Introducción: Los trastornos respiratorios del sueño son una de las patologías más multidisciplinarias de la medicina actual. Muchas son las especialidades que intervienen, entre ellas, de forma destacada, la otorrinolaringología. Da la impresión de que entre los otorrinolaringólogos hubiera un cierto desinterés hacia el abordaje de dichos trastornos en los últimos tiempos.
Objetivo: Se pretende evaluar de una forma objetiva el nivel de participación de los otorrinolaringólogos en publicaciones científicas sobre los trastornos respiratorios del sueño.
Material y método: Se revisan dos bases de datos bibliográficas, una nacional (Índice Médico Español) entre los años 1997 y 2006 y una internacional (MEDLINE) entre 2001 y 2006. También se recogen las publicaciones Acta Otorrinolaringológica Española entre 2001 y 2006.
Resultados: Las publicaciones de otorrinolaringólogos en el Índice Médico Español ocupan un segundo lugar, con 27 (13,56 %) de 191, y en MEDLINE, el tercer lugar, con 919 (12,04 %) de 7.011. El nivel de colaboraciones con participación de otorrinolaringólogos es bajo: participan en el 2,35 % de todas las publicaciones en que firma más de una especialidad y son publicaciones en colaboración el 3,15 % de las presentadas por otorrinolaringólogos. En Acta Otorrinolaringológica Española, los trastornos respiratorios del sueño ocupan un nivel bajo (14/566 [2,47 %]). Por países, España se sitúa en MEDLINE en octavo lugar (286 publicaciones) de todas las especialidades y en el sexto (27 publicaciones) en las escritas por otorrinolaringólogos.
Conclusiones: Desde la perspectiva de las publicaciones científicas, la otorrinolaringología sigue ocupando un lugar destacado en cuanto al número de participaciones, pero el nivel de colaboración con otras especialidades es bajo y debería potenciarse.

Palabras clave: Publicaciones. Otorrinolaringología. Trastornos respiratorios del sueño.

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INTRODUCTION

In an editorial for this same journal, we noted in 2005 that the approach to respiratory sleep disorders (RSD) is complex, both because of its physiological characteristics and also for the number of specialists who may be involved during the process.[1] RSD represent one of the most multidisciplinary pathologies in medicine today and none of the specialities involved should be excluded or opt out from participating in the process.

Otorhinolaryngology (ORL) should always be present in relation to the progress and contributions in this pathology, as it was in its beginnings and subsequent development. However, in recent times the role of ENT specialists in addressing this disease appears to have been significantly reduced. Surgery has not lived up to the expectations created and a poor or non-existent selection of candidates for surgery has led to the disparagement of our role to a large extent.[1]

There seems to be a systematic confrontation with other specialities which seem to be more prominent in the treatment of these disorders. Some have the power and resources needed to steal all the limelight, develop multi-site studies and promote interdisciplinary meetings. Our speciality, however, does not seem to work along the same lines and the interest shown may be too local and not well focused.

On the other hand, we have the impression there is less and less interest in this disease among our fellow specialists. We need only look at the contribution by communications and other papers at some recent national congresses. At the last congress, held in Madrid in November 2007, there were about 5 communications on RSD (3.22%) out of a total of 155 and 2 posters out of 298 (0.67%). These poor figures have been present for a few years running. In San Sebastian, at the 2004 congress, the percentages were similar: 4.21% of the communications and 0.41% of the posters were given over to RSD.

In the context of these reflections, the present paper aims to study, in a relatively objective manner, the real present role of our speciality in dealing with RSD and to compare it with other specialities, both in Spain and the rest of the world. At the same time, our secondary goal is an approximation to the place RSD holds in otolaryngology today, compared with other traditional pathologies of this speciality. Ultimately, our aim is to find out whether or not this subjective impression about the apparent lack of interest in RSD topics among otolaryngologists is true.

MATERIAL AND METHOD

To shed light on these issues, basic publications in journals on RSD were selected as the main source of information. Bibliographic databases are a major source of information in medicine and the search tool used by most professionals.[2,3] It is a fast, affordable and easily-handled tool allowing the orderly and systematic harvesting of information.

The 3 sources used for this paper are: *a)* the MEDLINE international database (available at: http://www.ncbi.nlm.nih.gov/sites/entrez), a bibliographic database maintained by the National Library of Medicine of the United States of America and collating references to articles published in more than 4500 medical journals since 1996[2,3]; it is available through various distributors, but the most widespread form is PubMed, developed by the National Centre for Biotechnology Information (NCBI) at the National Library of Medicine (NLM), belonging to the National Institutes of Health (NIH)[2]; *b)* the "Indice Médico Español" (Spanish Medical Index or IME) (available at: http://bddoc.csic.es:8080/inicioBuscarSimple.do;jsessionid=0130932048EEB980562C3DFDF7E95E59?tabla=docu&bd=IME=&estado_formulario=show), currently the largest database of Spanish publications in health sciences, with a volume of about 271 000 records from about 360 publications,[3] including most of the scientific medical journals in Spain, and founded at the University of Valencia in 1965; and *c)* the publications by the organ of the Spanish Society of Otorhinolaryngology, *Acta Otorrinolaringológica Española*, details of which are available on the Society's website since 2001.[4]

MEDLINE

We have included the publications from 2001 to 2006, selected by the words: "Sleep apnoea or Snoring." The following fields have been collected from each publication: "owner, status, PMID, Year 8, Month 9, Title, Article Title, Affiliation." All this information was expressed in XML format and then transferred to a spreadsheet in MS Excel. All records were filtered to avoid duplication and the different fields were manually coded from the spreadsheet for further use depending on the intended analysis. The necessary recounts were verified in the spreadsheet.

Once filtered and coded, the fields analyzed were:

– Year of publication

– Speciality of the magazine: it has been necessary to code the different names of the journal in the specific speciality. For this codification, especially for magazines little known due to their geographical origin, the ancillary database of MEDLINE, called Journals database, has been very useful. A series of groupings has been carried out in order to facilitate the different calculations described in Table 1

– Title of publication: the various records on the 18 topics that can be seen in Table 2 have been coded based on this title. The same encoding has been used for the other databases and is applicable to all specialities involved

– Speciality of the author: the speciality of the first signatory has been taken as a reference, but also taking into account the different collaborations. Different groupings have also been made in this section (equivalent to those in Table 1) with the aim of facilitating the different counts. It should be added that any paediatric speciality, such as paediatric otolaryngology, is considered under the major speciality, ie, in this case, otolaryngology. The only exception is paediatric surgery, which is included in paediatrics. The same is true for radiological specialities such as neuroradiology, which are included in neuroscience, or the concept of transplants,

Table 1. Groupings of Magazines' and Authors' Specialities for the MEDLINE and IME Bibliographic Databases

General Speciality	*Specialities Included*
Anaesthesia	Anaesthesiology, pain, ICU
Cardiology	Circulation, cardiology, HBP, arteriosclerosis, thrombosis, electrophysiology, dysrhythmia, echocardiography, electrocardiography, heart and lung
Biomedical sciences	Human anatomy, physiology, biology, biomedical physics, genetics, immunology, basic general research, aerospace, pharmacology, experimental medicine, telemedicine
Non-medical sciences	Insurance, economics, mathematics, physics, engineering, I.T., industry, chemistry, business school, veterinary science, zoology
Surgery	Surgery, baryatric, laparoscopic, endoscopic, gastrointestinal surgery
Dentistry	Dentists, odontology
Dermatology	–
Digestive system	Digestive system, hepatology
Endocrinology	Dietetics, obesity, metabolism, diabetes, nutrition, endocrinology (does not include surgery for obesity)
Nursing	–
Gynaecology	Gynaecology, obstetrician, mother and child
Locomotive system	Traumatology, rehabilitation, orthopaedics, physiotherapy, rheumatology
Maxillofacial	Maxillofacial surgery, plastic surgery
Medicine	Internal medicine, oncology, haematology, physiotherapy, emergency care, evidence-based medicine, psychosomatics
Pneumology	Asthma, allergy, pneumology
Neurosciences	Neurology, psychiatry, psychology, addictions, behaviour, cephalgia
Ophthalmology	–
Otolaryngology	Otorhinolaryngology, voice
Paediatrics	Neonatology, auxology, paediatrics, paediatric surgery
Kidney	Nephrology, urology, andrology
Health	Biostatistics, sports, public health, occupational medicine, preventive medicine, quality, population science, patient education, human ecology, environmental science, management, hospitals, family medicine, legal affairs, epidemiology, Food and Drug Administration, geriatrics, forensics, hygiene and tropical medicine, sexology, toxicology
Basic services	Pathology, functional examinations, radiology, laboratory, analysis
Sleep	Sleep laboratory, neurophysiology

Table 2. Groupings of RSD Topics Dealt With in the MEDLINE and IME Bibliographic Databases

Topic Code	*Aspects Included*
Epidemiology	Epidemiology, quality of life, traffic, work-related accidents, obesity, public health, medical and legal aspects
Clinical presentation and diagnosis	Clinical evaluation, clinical consequences of RSD, clinical and general diagnosis, screening systems, questionnaires, systemic diseases causing RSD or caused by them, case studies, relationship of RSD to systemic diseases
Exploration and anatomy of upper airways	Otolaryngological examination, upper airway endoscopy, radiology, anatomical examination
Physiopathology	General physiopathology, physiopathology of molecules, muscles and gases, histopathology, neural physiopathology, anatomical aspects and physiopathology, posture
RSD in children	General obstructive sleep apnoea syndrome (OSAS) in children, neurocognitive alterations, enuresis, inheritance, general paediatric surgery, CPAP in children
Adenoamygdalar surgery	Adenoidectomy and adenoids in RSD, amygdalectomy and amygdalae in RSD, laser in amygdalae
Palate surgery	Uvulopalatopharyngoplasty, laser or radiofrequency surgery of the palate, palate surgery, palate implants
Nose and RSD	Nasal physiopathology in RSD, nasal examination in RSD, nasal surgery, alar dilatators, nose and CPAP
Surgery	General, pharyngeal, hypopharyngeal and multi-level surgery, obesity surgery, surgery for snoring, general radiofrequency and laser surgery
Lingual surgery	Surgery of the base of the tongue, lingual surgery, lingual laser surgery, lingual suspension, suspension with screw
Maxillomandibular surgery	Bimaxillar advance, chin advance, surgery of the hyoid and mandible, maxillary surgery, maxillomandibular surgery, Stanford phase 1
Orthodontics	MJD, mandibular distraction, alteration of the TMJ and OSA syndrome, orthodontics
CPAP	–
Anaesthesia	Pre-operative evaluation, problems during anaesthesia, care of anaesthesia in RSD
Other treatments	Electrical stimulation, tracheotomy, medical treatment
RSD in general	RSD in general, treatment in general, specialities and RSD
Polysomnography and recording	Polygraph, oxymetry, polysomnography in children, snoring meters, drowsiness, restless legs, sleep architecture, electroencephalographic data, drowsiness measurement tests
Snoring	–

where the speciality has been attributed to the organ transplanted

– Country of the main author: this information had to be extracted, like that of the author's speciality, and was encoded manually from the "Affiliation" field

The various counts, calculations and comparisons have been conducted with the information collected from these 5 fields. A comparison has been made between the publications by the various medical or non-medical specialities involved and their origin. In terms of the author's speciality, the overall distribution is shown, as well as the number and percentage of collaborations, the different topics covered by speciality and the distribution by country depending on the speciality. As for the speciality of the journal, the general and country distributions are also analyzed. In the case of the country of origin of the article, with regard to Spain, the data have been broken down to city level. Finally, from the point of view of RSD topics treated, a general distribution has been made, and also by the specialities most relevant to the otolaryngologist as well the distribution of our speciality itself.

Índice Médico Español (Spanish Medical Index)

We have collected all publications with the search term "Apnea del sueño o ronquido" (Sleep apnoea or snoring) between 1997 and 2006, inclusive. The fields analyzed are: year of publication, speciality of the author, journal and topic or title of the work. All fields were coded, filtered and transferred to a database for further processing. The encoding used for the fields of topic and journal are equivalent to those indicated for the MEDLINE database.

Acta Otorrinolaringológica Española

Data was collected from the website of the SEORL, which holds the index to all the issues published from 2001 to 2006 inclusive. The fields collected and encoded were: year of publication, cases with collaborations with other specialities, the city of the first signatory author, encoding of the otolaryngology items published and location of the article within the Journal: "Investigación básica" (Basic Research), "Investigación clínica" (Clinical Research), "Editorial" (Editorial), "Casos o notas clínicas" (Case Studies or clinical notes), "Cartas al director" (Letters to the Editor), "Yo lo hago así" (My way of working), "Conceptual" (Conceptual), or "Revisión" (Review).

RESULTS

MEDLINE

After filtering and sorting the publications listed in this bibliographic database, a total of 7011 publications dealing with RSD were obtained in the 6 years covered by the search. The distribution of authors by speciality and the number of collaborations are shown in Table 3.

The count of leading magazines in which the 7011 articles on RSD have been published in these 6 years resulted in: journals of pneumology, 1582 (22.56%); sleep journals, 863 (12.3%); and in third place, otolaryngology journals, 846 (12.06%). Medical journals published 839 articles (11.96%). Further back we found other specialities such as neuroscience, with 570 (8.13%), biomedical sciences, with 442 (6.3%), cardiology, with 375 (5.34%), and paediatrics, with 277 (3.95%). Specialities relatively close to otolaryngology presented few articles on RSD in their journals, such as maxillofacial surgery, 103 (1.46%), or dentistry, 188 (2.68%).

If we focus on the 919 publications signed by otolaryngologists, 737 (80.19%) were published in journals of the same speciality. Other journals with a significant number of articles published by otolaryngologists are those for medicine, with 71, pneumology, 28, and sleep, with 33.

With respect to the topics addressed by the different specialities, particularly otolaryngology and related specialities or others which may be interesting to compare, the results are expressed in Table 4.

Lastly, the distribution of the different publications by countries of origin of authors, both in general and those specific to otolaryngology, are shown in Table 5. It has been decided to list all the countries which presented at least 10 publications, and the rest are grouped under the heading "Others." Table 6 shows the list of Spanish cities producing publications on RSD and covered in MEDLINE.

Índice Médico Español (Spanish Medical Index)

Between 1997 and 2006, ie, 10 years, a total of 191 publications related to RSD have been collected. The main specialities involved have been: pneumology, with 77 publications (38.69%); otolaryngology, with 27 (13.56%); and neurology, with 20 (10.05%). Further back in the list appear other specialities such as internal medicine (14), neurophysiology (13), paediatrics (12), or dentistry (10).

The journals for the 191 articles are in the speciality of pneumology in 71 (37.17%) cases, otolaryngology in 22 (11.51%), and medicine in 22 (11.51%). Paediatric journals published 19 (9.94%) of the articles and neurosciences, 10 (5.23%). Neurophysiology or sleep journals published 10 (5.23%), cardiology or hypertension, 11 (5.75%) and dentistry participated with 9 (4.71%). The rest of the specialities have little meaningful input.

The topics covered in the 27 articles signed by otolaryngologists are about RSD in childhood (7), surgery (5), and another 5 physiopathology and exploration of the upper airways; 3 deal with outreach, 2 RSD and various ailments, 2 clinical presentation or epidemiology and lastly, one each for nCPAP and mandibular advancement devices.

Finally, the distribution by cities of the different otolaryngology publications on RSD obtained from the IME in the past 10 years shows: 9 out of 27 in Barcelona, 5 in Madrid, 4 in Zaragoza, 2 in Valencia, 2 in Seville, 1 in Cadiz, 1 in Badajoz, 1 in Santander, and 1 in Oviedo. The last one comes from the Sleep Committee of the SEORL.

Acta Otorrinolaringológica Española

A total of 566 articles were collected between 2001 and 2006. Of these, 43 (7.6%) were about basic research, 317 (56%)

Table 3. Distribution of MEDLINE Publications on RSD According to the Speciality of the Author

Speciality	*Without Collaboration,[a] No.*	*Collaborations,[b] No. (%)*	*Collaborations,[c] %*	*Total,[d] No. (%)*
Pneumology	1157	295 (20.31)	24	1452 (19.03)
Sleep	659	397 (37.59)	32.3	1056 (13.84)
Otorhinolaryngology	890	29 (3.15)	25	919 (12.04)
Neurology	687	134 (16.32)	10.9	821 (10.76)
Medicine	608	38 (5.8)	3.09	646 (8.46)
Paediatrics	324	58 (15.18)	4.71	382 (5)
Biomedical sciences	286	61 (17.08)	4.96	357 (4.67)
Cardiology	277	74 (21.08)	6.02	351 (4.6)
Health	292	13 (4.26)	1.05	305 (3.99)
Dentistry	205	27 (11.63)	2.19	232 (3.04)
Anaesthesia	157	17 (9.77)	1.38	174 (2.28)
Non-medical sciences	131	13 (9.02)	1.05	144 (1.8)
Surgery	121	8 (6.2)	0.65	129 (1.69)
Maxillofacial	108	17 (13.6)	1.38	125 (1.63)
Basic services	77	17 (18.08)	1.38	94 (1.23)
Endocrinology	73	14 (16.09)	1.13	87 (1.14)
Nursing	79	4 (4.81)	0.32	83 (1.08)
Kidney	54	1	0.08	55 (0.72)
Digestive system	27	8 (22.85)	0.65	35 (0.45)
Ophthalmology	33	0	0	33 (0.43)
Gynaecology	24	2 (7.69)	0.16	26 (0.34)
Locomotive system	21	2 (8.69)	0.16	23 (0.3)
Dermatology	7	0	0	7 (0.09)
Unknown	93	0	0	93 (1.21)
Total	6400	1229 (16.1)	–	7629

[a]The sum of the first column is lower than 7011 because collaborations have not been taken into account.
[b]Percentage of collaborations in the total for the speciality.
[c]Percentage of collaborations in the total of articles published in collaboration (1229).
[d]Percentage of publications in the total of articles (7629).
In the last column, the total sum is larger than 7011 publications, because there are articles in collaboration that have been counted more than once.

about clinical research, 8 (1.41%) were editorials, 155 (27.38%) dealt with case reports or "My Way of Working," 16 (2.82%) were letters, and 27 (4.77%) were conceptual or reviews. The different topics covered in the 566 publications are summarized in Table 7.

Of the 14 articles on RSD published in *Acta Otorrinolaringológica Española* in the 6 years reviewed, 5 were from Valencia and 5 from Barcelona, 2 from Zaragoza, 1 from Madrid and 1 from Oviedo. Of these 14 publications, 6 were in collaboration with other departments (neurophysiology, preventive medicine, anaesthesia, dentistry, and maxillofacial surgery).

Given the low number of publications, the distribution by years does not offer any remarkable result. The location within the concepts currently grouped by *Acta Otorrinolaringológica Española* was: 11 (78.57%) cases as Clinical Research, 2 as Cases or Clinical Notes, and 1 Editorial.

The topics covered in these 14 articles were: 4 on surgery, 3 on clinical presentation, 2 more on exploration of upper airways, and 2 on RSD in childhood. On RSD in general, treatment with nasal continuous positive air pressure (nCPAP) and mandibular advancement devices, 1 each.

DISCUSSION

Bibliographic databases have been used as a source of information to carry out this work. We could have used different, equally valid sources: communications and posters presented at medical meetings and conferences, courses on RSD organized by various scientific societies, number of round tables or workshops at different conferences, teaching hours devoted to RSD in university education in comparison with other aspects of each of the specialities or applied to

Table 4. Topics Treated by the Speciality of Otorhinolaryngology in the MEDLINE Bibliographic Database[a]

Topic Code	*Otolaryngology*	*Pneumology*	*Stomatology*	*Maxillofacial*
Epidemiology	26 (2.82)	146 (10.05)	7 (3.01)	3 (2.4)
Clinical presentation and clinical diagnosis	91 (9.9)	401 (27.61)	9 (3.87)	9 (7.2)
Exploration and anatomy of upper airways	58 (6.31)	6 (0.41)	16 (6.9)	5 (4)
Physiopathology	81 (8.81)	235 (16.18)	37 (15.94)	9 (7.2)
RSD in children	76 (8.26)	62 (4.26)	11 (4.74)	6 (4.8)
Adenoamygdalar surgery	100 (10.88)	5 (0.34)	0	0
Palate surgery	130 (14.14)	8 (0.55)	3 (1.29)	4 (3.2)
Nose and RSD	46 (5)	14 (0.96)	0	2 (1.6)
Surgery	108 (11.75)	11 (0.75)	3 (1.29)	9 (7.2)
Lingual surgery	19 (2.06)	0	0	0
Maxillomandibular surgery	21 (2.28)	0	10 (4.31)	43 (34.4)
Orthodontics	12 (1.3)	33 (2.27)	98 (42.24)	26 (20.8)
CPAP	9 (0.97)	197 (13.56)	2 (0.86)	1 (0.8)
Anaesthesia	4 (0.43)	6 (0.41)	2 (0.86)	0
Other treatments	15 (1.63)	19 (1.3)	1 (0.43)	0
RSD in general	56 (6.09)	169 (11.63)	31 (13.36)	8 (6.4)
Polysomnography and recording	55 (5.98)	141 (9.71)	1 (0.43)	0
Snoring	13 (1.41)	3 (0.2)	1 (0.43)	0
Total	919 (100)	1452 (100)	232 (100)	125 (100)

[a]The data are expressed as No. (%).

them in the training of resident physicians or even specific doctoral dissertations on the topic in comparison with other diseases.

Another possibility would have been to conduct surveys targeting the various specialists or facilities. It should be noted that this mechanism was already attempted by the Commission on Sleep Disorders of the SEORL 2 years ago. Out of more than 1200 surveys sent, only 72 responses were received, representing less than 10% (presentation by the author at the 57th National Congress held in Granada in October 2006 as panellist on the Round Table: "Role of otolaryngology in the diagnosis and treatment of sleep apnoea").

The use of all these other alternative sources of information meant that the data obtained would be biased, limited and unreliable, and in many cases very difficult to compare with other specialities and with other countries. Therefore, we opted for the source of indexed journals or publications. Thanks to the various databases in existence, it is a source of information which, although biased in some aspects,[2,3] is more accurate and reliable.

In a recent article about the scientific literature published on sleep disorders, otolaryngology specialists and speciality magazines are ranked, in terms of participation levels, well below those observed in the present study.[3] The author points out that 47% of Spanish articles on sleep deal with RSD. If we focus on journals of pneumology and cardiology and *Acta Otorrinolaringológica Española*, then RSD represents all the publications on sleep.[3] If we talk about sleep disorders in general, in the IME, the journals on otolaryngology come in fifth and the signatories with this speciality in eleventh place.[3] All these biases mean that such work does not bring too much clarity to the attempt to answer our question.

The introduction to this review indicates that its goal is to confirm or refute a subjective impression regarding the decline in the interest of the otolaryngology with respect to RSD. It could be said that this subjective impression is half confirmed. The number of publications improves those obtained in some of the recent national congresses of the speciality.

Pneumology is by far the speciality which publishes most in connection with RSD, both in Spanish and worldwide databases. In the IME, out of 191 publications, 77 (38.7%) are from this speciality, and in MEDLINE it accounts for 19% out of more than 7000 records (Table 3). However, in both databases, articles signed by otolaryngologists occupy a prominent place in the ranking. In IME they are in second place with 27 publications (13.56%), above specialities such as neurology (10%) and far ahead of paediatrics, neurophysiology or dentistry. In MEDLINE otolaryngology ranks third with 919 publications (12.04%), behind the speciality of sleep (13.84%).

In this database, if we consider only the publications generated without the involvement of other specialities, sleep occupies fourth place and otolaryngology second. Specialities related to otolaryngology, such as maxillofacial

Table 5. Geographical Origin of the Publications on RSD Obtained From MEDLINE

Country	*Publications,*[a] *No. (%)*	*Otolaryngology Publications,*[b] *No. (%)*
United States	2390 (34.08)	220 (9.2)
Japan	448 (6.38)	55 (12.27)
Germany	420 (5.99)	83 (19.76)
France	373 (5.32)	20 (5.36)
United Kingdom	346 (4.93)	56 (16.18)
China	341 (4.86)	127 (37.24)
Canada	313 (4.46)	11 (3.51)
Spain	286 (4.07)	27 (9.44)
Australia	253 (3.6)	9 (3.55)
Italy	237 (3.38)	16 (6.75)
Sweden	131 (1.86)	23 (17.55)
Turkey	122 (1.74)	39 (31.96)
Brazil	101 (1.44)	21 (20.79)
Poland	110 (1.56)	18 (16.36)
Belgium	89 (1.26)	19 (21.34)
Switzerland	88 (1.25)	6 (6.81)
Greece	65 (0.92)	6 (9.23)
Netherlands	60 (0.85)	23 (38.33)
Taiwan	58 (0.82)	26 (44.82)
Finland	53 (0.75)	13 (24.52)
India	41 (0.58)	3 (7.31)
Ireland	40 (0.57)	3 (7.5)
Korea	32 (0.45)	4 (12.5)
Singapore	35 (0.49)	12 (34.28)
Russia	32 (0.45)	6 (18.75)
Portugal	33 (0.47)	0
Austria	32 (0.45)	2 (6.25)
New Zealand	35 (0.49)	1 (2.85)
Norway	27 (0.38)	13 (48.14)
Thailand	17 (0.24)	11 (64.7)
Egypt	14 (0.19)	8 (57.14)
Slovakia	10 (0.14)	0
Denmark	11 (0.15)	6 (54.54)
Hungary	18 (0.25)	0
Mexico	13 (0.18)	0
Pakistan	11 (0.15)	2 (18.18)
Saudi Arabia	11 (0.15)	1 (9.09)
Others	164 (2.33)	8 (0.87)
Unknown	74	
Total	7011	919

[a]Percentage of the total publications.
[b]Percentage of the total publications for the country.

Table 6. Spanish Publications on RSD Obtained From MEDLINE, by Cities

City	*Publications in General,*[a] *No. (%)*	*Otolaryngology Publications,*[b] *No. (%)*
Barcelona	80 (28.67)	10 (12.5)
Madrid	37 (13.26)	3 (8.1)
Valencia	17 (6.09)	4 (23.52)
Seville	12 (4.3)	0
Palma de Mallorca	13 (4.65)	0
Jaén	14 (5.01)	0
Cáceres	9 (3.22)	0
Santiago de Compostela	9 (3.22)	0
Zaragoza	11 (3.94)	6 (54.54)
Pamplona	6 (2.15)	0
Valladolid	7 (2.5)	0
Vitoria	8 (2.86)	0
Burgos	5 (1.79)	0
Bilbao	3 (1.07)	0
San Sebastián	3 (1.07)	0
Santander	4 (1.43)	1 (25)
Lugo	3 (1.07)	0
Granada	3 (1.07)	1 (33.3)
A Coruña	4 (1.43)	0
Alicante	4 (1.43)	0
Córdoba	3 (1.07)	0
Oviedo	3 (1.07)	0
Málaga	2 (0.71)	0
Almería	2 (0.71)	0
Orense	2 (0.71)	0
Salamanca	2 (0.71)	0
Tenerife	2 (0.71)	0
Albacete	1 (0.35)	0
Castellón	1 (0.35)	0
Cuenca	1 (0.35)	0
Girona	1 (0.35)	0
Guadalajara	1 (0.35)	0
Las Palmas de Gran Canaria	1 (0.35)	0
León	1 (0.35)	0
Lleida	1 (0.35)	0
Murcia	1 (0.35)	0
Pontevedra	1 (0.35)	0
Tarragona	1 (0.35)	1 (100)
Toledo	1 (0.35)	0
Vigo	1 (0.35)	0
Spain (unspecified)	2 (0.71)	1
Total	286	27

[a]Percentage of the total publications.
[b]Percentage of the total publications from the city.

Table 7. List of Topics Published in *Acta Otorrinolaringológica Española*

Topic	*Articles, No. (%)*	*Total, No. (%)*
External and middle ear		60 (10.6)
Malformations of the ear	7	
Ear tumours	6	
External auditory canal	11	
Middle ear surgery	15	
Transmission hearing loss	6	
Chronic middle otitis	15	
Internal ear		142 (25.08)
Auditory screening	16	
Implants and hearing aids	15	
Involvement of the cerebellopontine angle	11	
Facial nerve	7	
Perceptive hearing loss	53 (9.36)	
Vertigo	40 (7.6)	
Nose		87 (15.37)
Sense of smell	5	
Nasal surgery	8	
Rhinitis, polyposis, and endoscopic surgery	33 (5.83)	
Epistaxis	6	
Tumours	24	
Midline lesions	5	
Malformations	6	
Pharynx and larynx		102 (18.02)
Pharynx infections	24	
Non-oncological involvement of the larynx	9	
Voice invlvement	15 (2.65)	
Stenosis, intubation, tracheotomy, and oesophagus	10	
Cancer of the larynx	44 (7.7)	
Cervical		44 (7.77)
Benign cervical tumours and abscesses	12	
Salivary gland involvement	15 (2.65)	
Thyroid and parathyroid	17 (3)	
General		117 (20.67)
General and otolaryngology diseases	7	
General oncology	71	
Basic sciences and otolaryngology	11	
Fractures and extraneous bodies	10	
ENT history	2	
Administrative	16	
Respiratory sleep disorders		14 (2.47)
Total	566	566 (100)

surgery or dentistry, come far behind in the rankings (tenth and fourteenth, respectively).

Our speciality does not stand out in collaboration or participation in publications alongside other specialities. In MEDLINE (Table 3), pneumology again figures prominently in this section: it is involved in 24% of all publications in which there is more than one speciality and there are collaborations with other specialities in 20.3% of its publications. The most prominent speciality in this field is sleep: out of all publications with more than one speciality, it appears in 32.3% of the works, and there is more than one discipline in 37.59% of total publications in which the first author has this speciality. Otolaryngology is far behind in this field, with a participation of only 2.35% in publications with collaboration and only in 3.15% of its publications was there collaboration. In this regard, neurology, cardiology, paediatrics, and biomedical sciences, for example, are ahead of otolaryngology.

Other specialities with a significantly smaller number of publications, however, present higher percentages of their total articles with collaboration with other disciplines: dentistry, maxillofacial surgery, basic services, endocrinology, or digestive.

These figures on the frequency of collaboration only confirm the degree of multidisciplinarity of RSD. It is observed in the extensive list of specialists who write about RSD and the vast number of journals that publish such work. Failure to achieve high levels of collaboration in various works and publications tends to mean that advances in the knowledge of the disease achieved by some specialists reach others late or are not exploited.[1]

At this point, it seems clear that otolaryngologists should embrace working as part of a team involving other specialities. We have much to contribute and much to learn. There are many aspects that would improve performance both in assistance and as scientists by collaborating with related specialities such as paediatrics, dentistry, neurophysiology, and pneumology.

When we review both databases for the journals the articles are published in, pneumology returns to the top in terms of participation. In the IME, of the 191 articles, 71 (37.17%) were published in journals of this speciality. Next come otolaryngology (22 [11.51%]), internal medicine and paediatrics. In MEDLINE too, pneumology journals accounted for the largest percentage of the total articles (22.56%), followed by those on sleep (12.3%) and in third place was otolaryngology with 846 publications (12.06%) in journals for this speciality.

Another interesting aspect is the role of publications on RSD in *Acta Otorrinolaringológica Española* with respect to other subjects in our speciality. Of the 566 articles published between 2001 and 2006, 14 (2.47%) deal with RSD. These publications are on a par with those referring to pathology of the voice or salivary glands, chronic middle ear infections, middle ear surgery or hearing aids and cochlear implants. The interest in RSD is far behind other topics such as perceptive hearing loss (9.36%), vertigo (7.6%), cancer of the larynx (7.7%) or nasal polyps and endoscopic sinus surgery (5.83%).

Our departments should boost the study and treatment of RSD, both among qualified specialists and in the training of future otolaryngologists. The aim would be to place the publications on RSD at the same level as those of endoscopic sinus surgery or vertigo, since its interest and social and

health-care impact are theoretically higher. We only have to look at the rates of prevalence or the consequences in health-care terms.[5]

One of the consequences of achieving this increase in the interest in RSD in our departments must be to increase the percentage of basic publications. The location within the sections of the magazine shows that of the 14 articles on RSD, 11 (78.57%) deal with clinical research, and none are on basic research. Suárez-Nieto says in an article on research published in 2005, that "the training of doctors in clinical research has implications for better aid, enabling the understanding of scientific advances and their application to everyday practice.[6]" This statement is clearly applicable to RSD.

The range of topics covered in the publications about RSD by otolaryngology is relatively wide. If, for example, a threshold figure of 8% of total publications for each speciality is taken, the topics signed by otolaryngologists are: palate surgery (14.14%), general surgery of RSD (11.75%), adenoamygdalar surgery (10.88%), clinical presentation and diagnosis (9.9%), physiopathology (8.81%) and RSD in childhood (8.26%). The speciality of pneumology also features a wide variety of topics: clinical presentation and diagnosis, physiopathology, nCPAP, epidemiology and sleep recordings. Other specialities which are relatively close to ours are much more localized; for example, dentists publish nearly 70% of their articles on orthodontics or physiopathology and maxillofacial surgeons, more than 50% on maxillomandibular surgery and orthodontics.

In the IME, otolaryngology publications, albeit in a number that does not allow too many significant conclusions to be drawn, coincide in relative terms: RSD in childhood, surgery and physiopathology and exploration of the upper airways. Similar figures are seen when studying the publications in *Acta Otorrinolaringológica Española* that address issues of surgery, clinical presentation, examination of the upper airways and RSD in children.

Although the range of topics addressed in the various publications on RSD signed by otolaryngologists is already wide, it should be increased. More approaches are needed to the most basic aspects of RSD, such as physiopathological and epidemiological aspects, the investigation of therapeutic alternatives to surgery and nCPAP, and to improve and standardize the expression of results of different treatments.

Another point on which there are surprisingly few publications signed by otolaryngologists is that of snoring. Otolaryngologists have always criticized those who trivialize this symptom. Its importance has been stressed in both numerical, social and health-care terms,[7] yet, on the other hand, publications in both MEDLINE and IME or in *Acta Otorrinolaringológica Española* are rather scant. If any speciality should study this aspect of RSD in depth, it is ours.

Finally, with regard to the geographical origin of the different publications listed in MEDLINE, the United States occupies, as expected, the most prominent place in both overall number of participations (2390) and in those signed by otolaryngologists (220), far ahead of the runner-up. This was to be expected, both for its power and capacity and because of the bias involved in using an Anglo-Saxon database.

Publications signed in Spain are at an acceptable level. In general publications, behind the USA come Japan, Germany, France, United Kingdom, China, Canada and, in eighth position, Spain, with 286 publications. If we take only those signed by otolaryngologists, United States remains the leading power, at a distance from the rest. It is followed by China, Germany, United Kingdom, Japan, Turkey, and Spain, in sixth place with 27 publications.

If we look at the percentage of publications signed by otolaryngologists with respect to the total number in MEDLINE, it is noted that China achieves 37.24%, Turkey 31.96%, and Germany 19.76%. Spain (9.44%) has similar figures to those of the United States (9.2%). It is curious to note that certain countries, despite generally low figures in terms of articles collected, have very high percentages of articles signed by otolaryngologists: Egypt (57.14%), Denmark (54.54%), Thailand (64.70%), Taiwan (44.82%), and Norway (48.14%).

Of the Spanish publications, Barcelona always occupies first place in the 3 databases reviewed. The most likely explanation is that doctors Quesada and Perelló pioneered the surgical treatment of this ailment.[8] Of the 14 articles in *Acta Otorrinolaringológica Española*, Barcelona signs 5 and Valencia another 5. In the IME, 9 of the 27 articles on otolaryngology are from Barcelona, 5 from Madrid, and 4 from Zaragoza. In MEDLINE, out of the 286 Spanish articles in total, 80 originated in Barcelona and 37 in Madrid, and if we take into account only the 27 on otolaryngology, 10 are from Barcelona, 6 from Zaragoza, and 4 from Valencia.

This study provides, in our opinion, an up-to-date view of the interest and involvement of otolaryngologists in approaching RSD. The methods used, although objective, include a high degree of bias, since not all the bibliographic databases available have been used, and those which were used are incomplete in many respects. Nevertheless, it may be useful to give us a perspective and improve our role in the future.

In conclusion, therefore, from the perspective of publications, our speciality occupies a prominent place in the treatment of RSD. The policy on approaching RSD in otolaryngology should be reviewed in the future. We have very good experience under our belt and this should be taken advantage of, as our speciality was one of the first in addressing the problem and worrying about it. But today we must carry out a self-appraisal and design how the future lines should be.[1] We must work more on research to maintain or, better yet, increase the number and, of course, the quality of publications on RSD, broadening the range of topics to be dealt with and the collaboration with other related specialities.

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