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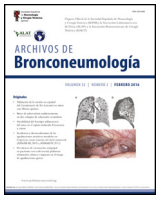

Original Article

Effect of Nasal Continuous Positive Pressure on the Nostrils of Patients with Sleep Apnea Syndrome and no Previous Nasal Pathology. Predictive Factors for Compliance☆

Francina Aguilar,[a,*] Ariel Cisternas,[b] Josep Maria Montserrat,[c,d,e,f] Manuel Àvila,[g] Marta Torres-López,[c,e,g] Alex Iranzo,[c,e,f] Joan Berenguer,[h] Isabel Vilaseca[c,d,e]

[a] *Servicio de Otorrinolaringología, Hospital General de Granollers, Granollers, Barcelona, Spain*
[b] *Unidad de Medicina del Sueño, Instituto Nacional del Tórax, Santiago de Chile, Chile*
[c] *Unidad Multidisciplinar de Trastornos del Sueño, Hospital Clínic, Barcelona, Spain*
[d] *Ciber Enfermedades Respiratorias (CIBERES), Bunyola, Islas Baleares, Spain*
[e] *Facultad de Medicina, Universitat de Barcelona, Barcelona, Spain*
[f] *Institut d'Investigació Biomédica August Pi i Sunyer (IDIBAPS), Barcelona, Spain*
[g] *Servicio de Radiodiagnóstico, Hospital Universitari Germans Trias i Pujol, Badalona, Barcelona, Spain*
[h] *Servicio de Radiodiagnóstico, Hospital Clínic, Barcelona, Spain*

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ABSTRACT

Objective: To evaluate the effect of continuous positive airway pressure (CPAP) on the nostrils of patients with sleep apnea–hypopnea syndrome and its impact on quality of life, and to identify predictive factors for compliance.
Methods: Longitudinal prospective study. Thirty-six consecutive patients evaluated before and 2 months after CPAP using the following variables: clinical (eye, nose and throat [ENT] symptoms, Epworth test, anxiety/depression scales, general and rhinoconjunctivitis-specific quality of life); anatomical (ENT examination, computed tomography); functional (auditive and Eustachian tube function, nasal flow, mucociliary transport); biological (nasal cytology); and polisomnographics. The sample was divided into partients with good adherence (≥4 h/d) and patients with bad adherence (<4 h/d).
Results: A significant improvement was observed in daytime sleepiness (*P*=.000), anxiety (*P*=.006), and depression (*P*=.023). Nasal dryness (*P*=.000), increased neutrophils in nasal cytology (*P*=.000), and deteriorating ciliary function were evidenced, particularly in partients with good adherence. No significant differences were observed in the other variables. Baseline sleepiness was the only factor predictive of compliance.
Conclusions: CPAP in patients without previous nasal pathology leads to an improvement in a series of clinical parameters and causes rhinitis and airway dryness. Some ENT variables worsened in partients with good adherence. Sleepiness was the only prognostic factor for poor tolerance.

Efecto de la presión positiva continua nasal sobre las fosas nasales de pacientes con síndrome de apneas del sueño sin patología nasal previa. Factores predictivos de cumplimiento

Palabras clave:
Síndrome de apnea del sueño
Rinitis

RESUMEN

Objetivo: Evaluar el efecto de la presión positiva continua en la vía aérea (CPAP) sobre las fosas nasales de pacientes con síndrome de apnea hipopnea del sueño y su impacto en la calidad de vida, e identificar factores predictivos de cumplimiento.

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* Corresponding author.
E-mail addresses: francinaaguilar@hotmail.com, faguilar@fhag.es (F. Aguilar).

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Inflamación nasal
Transporte mucociliar
Cumplimiento de la presión positiva continua en la vía aérea

Métodos: Estudio prospectivo longitudinal. Treinta y seis pacientes consecutivos evaluados antes y 2 meses tras CPAP usando las siguientes variables clínicas (síntomas otorrinolaringológicos, test de Epworth, escala de ansiedad/depresión, calidad de vida general y específica para rinoconjuntivitis); anatómicas (exploración otorrinolaringológica, tomografía computarizada); funcionales (función auditiva y tubárica, flujo nasal, transporte mucociliar); biológicas (citología nasal), y polisomnográficas. Se dividió la muestra entre cumplidores (≥4 h/d) y no cumplidores (<4 h/d).
Resultados: Se objetivó una mejoría significativa en la somnolencia diurna (p = 0,000), la ansiedad (p = 0,006) y la depresión (p = 0,023). Se evidenció sequedad nasal (p = 0,000), aumento de neutrófilos en la citología nasal (p = 0,000) y deterioro de la función ciliar, especialmente en cumplidores. No se evidenciaron diferencias significativas en el resto de las variables. La somnolencia inicial fue el único factor pronóstico de cumplimiento.
Conclusiones: El tratamiento con CPAP en pacientes sin patología nasal previa mejora una serie de parámetros clínicos y provoca rinitis y sequedad en la vía aérea. Algunas de las variables otorrinolaringológicas empeoran en los cumplidores. La somnolencia fue el único factor pronóstico de mala tolerancia.

Introduction

Sleep apnea–hypopnea syndrome (SAHS) is characterized by complete or partial obstruction of the upper airway while the patient is asleep, accompanied by oxyhemoglobin desaturation or micro-awakenings. SAHS is associated with a higher risk of cardiovascular disease, arterial hypertension, neurocognitive changes and death.[1] Continuous positive airway pressure (CPAP) is the treatment of choice in most patients with moderate-severe SAHS, and helps control the disease, improves quality of life and reduces morbidity and mortality.[2]

Treatment must be applied continuously to be effective, but adverse reactions mean that mid-term compliance is only achieved in 60% of patients.[3] CPAP tolerability and compliance studies have shown varying results.[4] Lack of compliance has been associated with mask discomfort, feeling of claustrophobia, noise disturbance, nasal inflammation, pharyngeal dryness, eye symptoms, non-specific ear discomfort, sleepiness or excessive fatigue.[5,6] The patient's psychological profile must also be taken into account, and educational and behavioral support play an important role in improving tolerability and compliance.[7,8]

CPAP-related rhinitis is a significant problem, but it is not always associated with poorer compliance.[9] We hypothesized that an in-depth study of changes occurring in the eyes, nose and throat (ENT) of patients receiving CPAP treatment could lead to the detection and early treatment of potential patients with bad adherence, and that personalized medicine in these cases will optimize management.

Our objective was to analyze changes occurring in the nostrils of SAHS patients with no previous nasal pathology after the introduction of CPAP, and the impact on treatment compliance.

Materials and Methods

Design

This was a prospective longitudinal study. Forty-one CPAP candidates, consecutively diagnosed with SAHS on polysomnography (apnea–hypopnea index [AHI]>10), were evaluated before and 2 months after starting CPAP treatment according to clinical, anatomical, functional, biological and polysomnographic variables. Each of the ENT evaluations and additional tests was performed by the same assessor, depending on the variable, before and after CPAP treatment. In all cases, the assessor was blinded as to the results of the other variables.

Inclusion and Exclusion Criteria

Only patients over 18 years of age were included. Excluded patients were those taking corticosteroids, antihistamines (nasal or systemic), or rhinitis-inducing medications (Table 1); patients previously treated with CPAP, BIPAP or oxygen; and patients with central apneas or previous nasal pathologies. All patients signed informed consent before study start.

Clinical Variables

Daytime sleepiness was quantified according to the Epworth scale,[10] with a score of >11 being considered excessive.[11] Patient mood was determined using the hospital anxiety-depression scale (HAD)[12]and *general quality of life* was assessed using the SF-12 questionnaire.[13]

ENT clinical symptoms were studied as follows: *Nasal congestion* was evaluated according to the Nasal Obstruction Symptom Evaluation scale (NOSE[14]; 0=no obstruction, 1=mild obstruction, 2=moderate obstruction, 3=severe obstruction). *Rhinitis symptoms* (nasal secretion, nasal pruritus, and sneezing) were classified according to the Rasp staging system[15] (0=asymptomatic, 1=mild symptoms, 2=moderate symptoms, 3=severe symptoms). *Nasopharyngeal dryness*, *hearing problems* (hypoacusia and tinnitus) and *skin and eye problems* (skin discomfort in the area of contact with the mask and eye irritation from mask air leaks) were evaluated individually on a scale of 0–3, in a similar manner to the Rasp scale. *Specific quality of life* associated with ENT symptoms was studied using the Rhinoconjunctivitis Quality of Life Questionnaire.[16]

Anatomical Variables

Otoscopy and *rhinoscopy* were classified as normal or abnormal.

Table 1
Rhinitis-inducing Drugs.

Antihypertensives (reserpine, guanethidine, phentolamine, angiotensin-converting enzyme inhibitors, methyldopa, adrenergic α-blockers [terazosine], β-blockers, terazosine, hydralazine, doxasozine, clonidine, prasozin)
Acetylsalicylic acid and other aspirin-derived non-steroidal anti-inflammatory drugs
Antihistamines
Tricyclic antidepressants
Ketotifen and astemizole
Oral and topical corticosteroids
Oral contraceptives and estrogen and/or progestogen preparations
Chlorpromazine
Neuroleptics
Topical ocular agents (betablockers, pilocarpine, etc.)
Benzalkonium chloride (in some topical vasoconstrictors)
Antibiotics (spiramycin, penicillin, etc.)
Nasal decongestants
Cocaine