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Short Communication

Adherence Patterns to Positive Airway Pressure in Elderly Patients With Obstructive Sleep Apnea

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ABSTRACT

This study aimed to evaluate objective adherence to positive airway pressure (PAP) therapy in elderly patients with obstructive sleep apnea (OSA) and to compare it with younger populations. We conducted a retrospective analysis on 5903 patients receiving PAP treatment (CPAP, AutoCPAP, or BIPAP) within a healthcare department serving 250,000 inhabitants. Data on demographics, treatment duration, and device-recorded usage were collected. Patients were categorized by adherence levels: non-compliant (<1 h/day), partially compliant (1–3 h/day), compliant (>3 h/day), and highly compliant (≥6 h/day). Two age groups were analyzed: <70 years (group A) and ≥70 years (group B). Mean adherence was 4.6 ± 2.9 h/day. Elderly patients demonstrated significantly higher adherence than younger patients (4.9 ± 2.9 vs 4.5 ± 2.9 h/day, $p < 0.001$) and a greater proportion of highly compliant individuals. These findings indicate that elderly patients exhibit better adherence, supporting PAP therapy use in this population.

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Patrones de adherencia a la presión positiva en la vía aérea en ancianos con apnea obstructiva del sueño

Palabras clave:
Apnea-hipopnea de sueño
CPAP
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RESUMEN

El objetivo de este estudio fue evaluar el cumplimiento objetivo del tratamiento con presión positiva en las vías respiratorias (PAP) en pacientes de edad avanzada con apnea obstructiva del sueño (AOS) y compararlo con pacientes más jóvenes. Se llevó a cabo un análisis retrospectivo de 5.903 pacientes que recibían tratamiento con PAP (CPAP, AutoCPAP o BIPAP) en un departamento de salud que atiende a 250.000 habitantes. Se recopilaron datos demográficos, sobre la duración del tratamiento y el uso registrado por el dispositivo. Se clasificó a los pacientes según sus niveles de adherencia: no cumplidores (<1 h/día), parcialmente cumplidores (1–3 h/día), cumplidores (>3 h/día) y altamente cumplidores (≥6 h/día). Se analizaron dos grupos de edad: <70 años (grupo A) y ≥70 años (grupo B). La adherencia media fue de 4,6 ± 2,9 h/día. Los pacientes de edad avanzada mostraron una adherencia significativamente mayor que los pacientes más jóvenes (4,9 ± 2,9 frente a 4,5 ± 2,9 h/día, p < 0,001) y una mayor proporción de individuos altamente cumplidores. Estos hallazgos indican que los pacientes de edad avanzada muestran una mejor adherencia, lo que respalda el uso de la terapia con PAP en esta población.

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Obstructive sleep apnea (OSA) is characterized by recurrent upper airway obstruction during sleep. Its prevalence increases markedly with age, affecting up to 75% of individuals ≥65 years

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Table 1
Distribution of adherence between groups A and B (under or over 70 years).

Age	<1 h	1–3 h	≥3 h	≥6 h	Total
<70 years	731 (17.4)	439 (10.3%)	3052 (72%)	1732 (41%)	4225
≥70 years	239 (14.2)	178 (10.6%)	1261 (75%)	873 (52%)	1678
Total	970	617	4336	2605	5903
		P-value: 0.042			

Table 2
Comparison by adherence groups between men and women, including highly compliant patients.

Gender	<1 h, *n* (%)	1–3 h, *n* (%)	≥3 and <6 h, *n* (%)	≥6 h, *n* (%)
Men	687 (15.6%)	404 (9.2%)	1221 (27.7%)	2096 (47.5%)
Women	283 (18.9%)	193 (12.9%)	393 (26.3%)	626 (41.9%)
		P-value: 0.013		

depending on diagnostic criteria, with aging identified as an independent risk factor.[1]

Continuous positive airway pressure (CPAP) remains the cornerstone of OSA treatment, demonstrating efficacy in reducing symptoms, improving cognitive function, and lowering cardiovascular risk. However, its effectiveness is highly dependent on adherence, typically defined as ≥4 h of use on at least 70% of nights, with optimal benefits observed at 6–8 h per night.[2] Despite this, adherence remains suboptimal: early discontinuation rates range from 5% to 50%, and long-term abandonment approaches 45%.

Adherence in older adults presents several challenges. While some studies report lower initial acceptance rates in elderly populations, adherence among those who initiate treatment can be comparable or even favorable, particularly in the short term. Evidence suggests a biphasic pattern, with adherence increasing up to approximately 75–80 years and declining thereafter.[3] Factors influencing adherence appear multifactorial, including comorbidities, cognitive status, and global functional impairment, rather than age alone.[4]

Moreover, sustained CPAP use in older adults is associated with significant clinical benefits, including reduced hospitalizations, improved neurocognitive outcomes, and enhanced quality of life. These findings underscore the need to identify determinants of adherence and implement targeted strategies to optimize long-term CPAP use in the aging population.[5]

The primary objective of our study was to evaluate the adherence pattern to CPAP in patients over 70 years of age. The secondary objectives were to evaluate the prevalence of CPAP use in our health department, to assess objective CPAP adherence patterns, to compare adherence between patients older and younger than 70 years, and to analyze adherence patterns according to gender.

We conducted a retrospective, cross-sectional cohort study in a health department serving approximately 250,000 inhabitants. The study period was from January 2024 to December 2025 and included 5903 patients receiving positive airway pressure (PAP) therapy for OSA. Eligible participants were users of CPAP, AutoCPAP, or bilevel positive airway pressure (BiPAP) devices, while those with incomplete or non-analysable data were excluded. Patients were stratified into two groups according to age: <70 years (Group A) and ≥70 years (Group B).

We assessed adherence through objective device hour meter data, calculated as the difference between two measurements obtained 3–6 months apart (calculated as the difference in the mean between measurements); additionally, 20% of patients were monitored via telemonitoring systems. Adequate adherence was defined as ≥3 h/day of use. Patients were further categorized into four adherence levels: non-compliant (<1 h/day), partially compliant (1–3 h/day), compliant (>3 h/day), and highly compliant (≥6 h/day).

Statistical analysis included descriptive and inferential methods. Continuous variables were expressed as mean ± standard deviation and categorical variables as percentages. Group comparisons were performed using Chi-square or Fisher's exact tests for qualitative variables and Student's *t*-test, ANOVA, Mann–Whitney, or Kruskal–Wallis tests for quantitative variables, depending on data distribution. Statistical significance was set at $p < 0.05$, and analyses were conducted using SPSS version 18.0. The study was approved by the Research Ethics Committee (ref. 25/053).

A total of 5903 PAP users were included (4843 CPAP, 1049 AutoCPAP, and 11 BIPAP). The gender distribution was 4408 men (74.7%) and 1495 women (25.3%), with a mean age of 61 ± 14 years. This proportion of women increased to 50% in those >70 years. The treatment prevalence was 2361 per 100,000 inhabitants. The mean time on treatment was 63.5 ± 49 months, with a mean pressure of 8 ± 2 cmH_2O.

Mean global adherence was 4.6 ± 2.9 h daily. Patients were distributed as follows: compliant ≥ 3 h (4336; 73.5%), partially compliant (597; 10.1%), and non-compliant (970; 16.4%). Notably, 46.1% (2722 patients) were highly compliant (≥6 h).

When dividing by age, Group A (<70 years) included 4225 patients (71.5%) with a mean age of 55 ± 11 years, while Group B (≥70 years) included 1678 patients (28.4%) with a mean age of 77 ± 5 years. Adherence was significantly higher in Group B (4.9 ± 2.9 h/day) compared to Group A (4.5 ± 2.9 h/day) ($p < 0.001$).

Likewise, the comparison between age groups (Table 1) confirmed that patients over 70 years present better global compliance rates ($p = 0.042$). Finally, the proportion of highly compliant patients was higher in Group B (52% vs 41% $p = 0.004$).

When analysing by gender, men showed higher adherence than women in all compliance groups ($p = 0.047$). Even when the highly compliant group is included (Table 2), the significant difference is maintained, with a lower proportion of women observed in the >6 h category (41.9% vs 47.5% for men; $p = 0.013$).

This study provides real-world evidence of a large series of OSA patients under PAP treatment showing a high prevalence.

In our series, women represented 25% of cases and were older at diagnosis; this proportion increased to 50% in those >70 years. OSA prevalence in women rises with age, approaching that of men, likely due to declining estrogen and progesterone, which impair respiratory stability and increase vulnerability to sleep-disordered breathing.[6]

Overall adherence was 73.5%. A 16.4% subgroup of non-compliant patients (<1 h/day) may be candidates for treatment withdrawal, allowing resources to focus on partially compliant patients (1–3 h/day). These results align with the 77% adherence reported in the eQUALISAS cohort (26,000 patients), which also observed lower adherence in women.[3]

Adherence was higher in patients > 70 years, with significantly more hours of use and a greater proportion of highly compliant individuals. Significant differences existed when comparing the

three compliance patterns, and the proportion of highly compliant patients was significantly higher in older patients.

Our results are in line with a prospective work carried out in older patients (>65 years) randomized to CPAP or conservative treatment, whose mean use was 4.9 ± 2.5 h/night, with 69.6% of patients being adherent.[7]

Ponce et al. carried out a randomized study in those over 70 years with moderate OSA. The mean use was 5.2 ± 2.5 h/day, with 20 patients < 4 h/night (72.6% with good adherence). The CPAP group achieved greater improvement in the Epworth Sleepiness Scale score and in symptoms.[8]

In another work which included patients over 80 years randomized to CPAP, the mean CPAP use was 4.3 ± 2.6 h/night. Patients in the CPAP group significantly improved snoring and observed apneas, as well as the AHI. However, they observed no clinical improvement in sleepiness, in the Quebec Sleep Questionnaire (QSQ), in any neurocognitive test, in OSA-related symptoms, in depression/anxiety, or in blood pressure levels.[9]

Conversely, our work contrasts with the series by López-Padilla et al. whose average compliance in patients over 65 years was 55%, highlighting that education on CPAP use and family support significantly improved adherence.[10]

A recent meta-analysis concludes that, in older people, CPAP has a significant impact on daytime sleepiness, sleep-related quality of life, cognitive functions, and mortality.[11]

The study's strengths include the large sample size and objective adherence measurement, while limitations relate to the retrospective design and lack of detailed clinical variables.

In conclusion, PAP therapy demonstrates favorable adherence in elderly patients, supporting its continued use, although targeted strategies are needed to optimize long-term compliance, clinical outcomes, and cost-effectiveness.

Ethical consideration

This study was approved by the Research Ethics Committee of the San Juan de Alicante University Hospital.

Artificial intelligence involvement

No artificial intelligence was employed in the manuscript.

Informed consent

Informed consent is not required for this study.

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Authors' contributions

Conceptualization: E.C, I.B, C.V.; writing – original draft preparation: E.C, I.B, C.V, S.V.; writing – review and editing: all authors. All authors have read and agreed to the published version of the manuscript.

Conflicts of interest

The authors declare not to have any conflicts of interest that may be considered to influence directly or indirectly the content of the manuscript.

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