Efficacy and Cost of Home-Initiated Auto-nCPAP versus Conventional nCPAP

Carole Planès MD, PhD;1 Marie-Pia D’Ortho MD, PhD;2,6 Arlette Foucher MD;1 Malika Berkani MD;3 Karl Leroux;4 Mohamed Essalhi MD;4 Christophe Delclaux MD, PhD;5 Maria-Antonia Quera-Salva MD, PhD;6 Frédéric Lofaso MD, PhD.6

1Service de Physiologie-Explorations Fonctionnelles, Hôpital Ambroise Paré, Assistance Publique des Hôpitaux de Paris, Université Paris 5, 92100 Boulogne, FRANCE, Ph: (33) 1 49 09 57 08; Fax: (33) 1 49 09 59 06; E-mail: carole.planes@apr.ap-hop-paris.fr
2Institut National de la Santé et de la Recherche Médicale (INSERM) U 492, 94010 Créteil, France; 3Service de Pneumologie et de Pathologie Professionnelle, Centre Hospitalier Intercommunal, de Créteil, 94010 Créteil, France; 4Association d’Entraide des Polios et Handicapés (ADEP), 92800 Puteaux, France; 5Service de Physiologie-Explorations Fonctionnelles et Centre d’Innovations Technologiques, Hôpital Raymond Poincaré, Assistance Publique des Hôpitaux de Paris, 92380 Garches, France; 6Institut National de la Santé et de la Recherche Médicale (INSERM) U 492, 94010 Créteil, France

Study objectives: To compare in a multicenter prospective study the efficacy and cost of conventional nasal continuous positive airway pressure (nCPAP) initiated at the sleep laboratory versus auto-nCPAP initiated at home.

Design: Patients with severe obstructive sleep apnea syndrome (OSAS) were randomized to treatment with either the REM+ auto device in constant mode at the effective pressure determined by titration at the sleep laboratory (n=17) or the REM+ auto device in automatic mode initiated at the patient’s home by a nurse (n=18). After 2 months, the efficacy and cost of nCPAP therapy and the time from diagnosis to nCPAP were evaluated. All values are reported as means±SD.

Patients: Thirty-five subjects with newly diagnosed OSAS (8 women and 27 men, mean age: 54.3 ± 10.6 years, apnea-hypopnea index (AHI) 58.1±14.0 h⁻¹).

Interventions: N/A

Measurements and Results: Both treatments were used properly and induced similar decreases in the AHI (7.6±6.9 vs. 10.4±12.5 h⁻¹ for auto-nCPAP and conventional nCPAP, respectively; NS) and Epworth Sleepiness score (from 15.5±4.7 to 7.5±3.4 vs. 14.7±3.9 to 7.6±3.4 for auto-nCPAP and conventional nCPAP, respectively; NS). With auto-nCPAP initiated at home, the time from diagnosis to final adjustment of nCPAP was shorter (16.3±5.0 vs. 47.2±46.5 days with conventional nCPAP, P<0.02) and the cost was lower (1263±352 vs. 1720±455 , respectively; P<0.05).

Conclusions: Treatment of OSAS with auto-nCPAP initiated at home is effective and reliable and reduces the time from diagnosis to therapy and the cost of treatment.

Key Words: Obstructive sleep apnea, CPAP titration, Cost, Home therapy


INTRODUCTION

NASAL CONTINUOUS POSITIVE AIRWAY PRESSURE (nCPAP), WHICH WAS INTRODUCED IN 1981 BY SULLIVAN ET AL.,1 HAS CONSIDERABLY IMPROVED THE TREATMENT AND PROGNOSIS OF PATIENTS WITH OBSTRUCTIVE SLEEP APNEA (OSAS). In practice, the optimal nCPAP level is a trade-off between pressure-related side effects and efficacy in preventing upper airway obstruction during sleep. This optimal pressure level is generally determined by manual titration during an overnight polysomnography study at the sleep laboratory. However, this conventional approach is expensive, time-consuming, and labor-intensive. As a result, sleep laboratories have long waiting lists for overnight polysomnography studies, which delays the initiation of effective treatment in patients with OSAS. This is of concern because untreated OSAS increases cardiovascular morbidity and the risk of traffic accidents.2 An easier and shorter procedure for nCPAP initiation would allow faster treatment and might save money.

Automatic nCPAP (auto-nCPAP) devices that continuously adapt the positive pressure in response to the patient’s needs have been developed recently and found at least as effective as constant-pressure CPAP in reducing sleep-disordered breathing. Because the device adjusts the pressure automatically, a titrating polysomnography study is theoretically unnecessary, and the treatment can be initiated at the patient’s home. This can be expected to save money and to shorten the time from diagnosis to nCPAP, as compared with conventional nCPAP. We conducted a multicenter randomized study in patients with newly diagnosed severe OSAS to compare conventional nCPAP initiated during a titrating polysomnography at a sleep laboratory and auto-nCPAP initiated at home. In both groups, nCPAP was provided by the REM+ auto device (Nellcore Puritan-Bennett, Nancy, France); this device was used in constant mode in the conventional nCPAP group and in automatic mode in the auto-nCPAP group. Efficacy parameters, the cost of treatment initiation, and the delay from diagnosis to treatment were compared in the two groups.

MATERIAL AND METHODS

Patients

This multicenter prospective study was approved by the appropriate Ethics Committee, and appropriate informed consent was obtained from all patients included in the study. Thirty-five patients were recruited between November 1998 and July 1999 at four sleep laboratories based on (i) severe obstructive OSAS with an apnea-hypopnea index (AHI) ≥30 events/hour and obstructive events >80% of total events and (ii) clinical indication for nCPAP according to American Thoracic Society recommendations.7 None of these patients (8 females, 27 males; mean age: 54.3±10.6 yrs; mean body mass index (BMI): 32.4±6.5 kg·m⁻²; mean Epworth Sleepiness Scale (ESS): 14.8±4.9) had a history of nCPAP therapy or surgery for snoring. No co-morbidities were noted.
Study Design

The patients were randomized to conventional nCPAP initiated at the sleep laboratory with a titrating polysomnography or auto-nCPAP initiated at home. The REM+auto device was used in constant mode in the conventional group and in automatic mode in the home group. After 2 months, efficacy of nCPAP treatment on sleep-disordered breathing and daytime sleepiness, cost of treatment initiation, and delay from diagnosis to treatment were compared in the two groups.

Nasal CPAP Initiation

In the conventional group, nCPAP pressure was titrated manually starting at 4 cm H2O during an overnight polysomnography study at the sleep laboratory. The effective pressure was the pressure at which obstructive respiratory events, including snoring and airflow limitation, disappeared in all sleep stages and body positions. Auto-nCPAP therapy was started at home by a nurse who provided instruction on use of the device. The pressure was allowed to increase from 6 cm H2O initially to no more than 16 cm H2O, based on snoring detection only.8,9 Data recorded by the CPAP device microprocessor (pressure levels and number of hours of actual nCPAP use) were transmitted daily to the sleep laboratory via a modem. After 1 week and at least 15 hours of actual nCPAP use, the patients were invited to switch to the other treatment. After 2 months of nCPAP, the patients completed the ESS10 and a tolerance questionnaire, as previously described.6 Duration of nCPAP use was downloaded from the device, and nCPAP efficacy was evaluated by overnight polysomnography at the sleep laboratory. The time from study inclusion to nCPAP was calculated. Total cost of the 2-month treatment was calculated by summing the costs of (i) hospital care; (ii) materials including nasal mask(s), mask strip(s), inspiratory circuit, expiratory valve, humidifier (but excluding the cost of the nCPAP device, which was identical in the two groups); (iii) telecommunication (phone calls and modem) and (iv) home visit(s) by the nurse (hourly cost of the nurse and transportation cost).

Sleep Studies

Three electroencephalogram leads (C3-A2, C4-A1, and O2-A1), two electrooculograms, and a submental electromyogram were used to stage sleep according to Rechtschaffen and Kales11 and to count arousals according to the American Sleep Disorder Association.12 During nCPAP studies, the nasal prong customarily used during polysomnography was replaced by a Fleisch #2 pneumotachograph (Lausanne, Switzerland) located between the mask and the hose and connected to a differential transducer (Validyne MP 45±5 cm H2O, Northridge, CA, USA). Thoracic and abdominal piezoelectors (Nihon Khoden, Tokyo, Japan) and pulse oximetry (Criticare 504, averaging time 3 s) were also used to monitor respiration. Apnea was defined as cessation of oronasal airflow for more than 10 seconds, and hypopnea as an at least 10-second reduction in oronasal airflow, by at least 50% of the value prevailing during the preceding normal breathing, followed by transient electroencephalographic arousal.

Statistical Analysis

All variables are given as means±SD. Between-group comparisons of anthropometric data, cumulative use, and cost were by t tests, and between-group comparisons of polysomnographic data and ESS scores before and during nCPAP therapy were by two-way ANOVA. P values < 0.05 were considered statistically significant.

RESULTS

Patient Characteristics

Seventeen patients were randomly assigned to conventional nCPAP therapy and 18 patients to auto-nCPAP therapy. There were no significant differences between these two groups regarding age (54.2±10.7 vs. 54.3±10.9 yrs, respectively; NS), BMI (30.9±6.1 vs. 33.6±6.7 kg·m⁻², respectively; NS), gender distribution (5 women and 12 men vs. 3 women and 14 men), or AHI (60.1±19.0 vs. 56.2±16.1 h⁻¹). In neither group did BMI change significantly during the study. No severe co-morbidities were noted, except hypertension in 7 patients, which was consistently well controlled by the treatment.

Time from OSAS Diagnosis to nCPAP

Mean time from diagnosis to nCPAP therapy initiation was significantly longer in the group treated with conventional nCPAP therapy initiated at the sleep laboratory than in the group treated with auto-nCPAP therapy initiated at home (47.2±46.5 vs. 11.8±15.5 days, respectively; P<0.01). This difference was ascribable to the long waiting time before the polysomnography study needed to initiate conventional nCPAP. The substantial variation in time from diagnosis to CPAP initiation in the auto-CPAP group was explained by the fact that the nurse was unable to obtain a home visit appointment before 24 days in one patient and 71 days in another. This last patient was 1 of the 2 patients who were unable to tolerate auto-nCPAP therapy and who refused to switch to the other nCPAP group. The mean time from diagnosis to final auto-nCPAP adjustment in the 16 patients who completed the study was about 16.3±5.0 days and remained significantly lower (P<0.01) than the mean time from diagnosis to conventional nCPAP therapy initiation.

Tolerance of nCPAP

Thirty patients completed the study. The 5 patients who dropped out of the study (3 in the conventional group and 2 in the auto-nCPAP group) were unable to tolerate nCPAP therapy, which they used for less than 1 hour per night and refused to switch to the other nCPAP group. The 2

**Table 1—Effect of nCPAP on sleep and breathing parameters**

<table>
<thead>
<tr>
<th></th>
<th>Conventional nCPAP (n=14)</th>
<th>Auto-nCPAP initiated at home (n=16)</th>
<th>P value baseline vs. nCPAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHI (events/h)</td>
<td>61.0±17.4</td>
<td>10.4±12.5</td>
<td>57.5±16.5</td>
</tr>
<tr>
<td>SaO2&lt;90% (% TST)</td>
<td>12.7±12.8</td>
<td>1.9±5.0</td>
<td>24.9±21.6</td>
</tr>
<tr>
<td>Ar/Awl (events/h)</td>
<td>48.5±14.2</td>
<td>14.5±9.1</td>
<td>44.4±19.1</td>
</tr>
<tr>
<td>TST (min)</td>
<td>376±98</td>
<td>351±71</td>
<td>368±75</td>
</tr>
<tr>
<td>WASO (min)</td>
<td>59.6±76.5</td>
<td>70.7±43.3</td>
<td>70.1±70.2</td>
</tr>
<tr>
<td>Slow-wave sleep (min)</td>
<td>48.6±46.2</td>
<td>86.0±35.0</td>
<td>40.7±39.9</td>
</tr>
<tr>
<td>REM sleep (% TST)</td>
<td>13.7±9.3</td>
<td>17.4±9.5</td>
<td>12.4±7.0</td>
</tr>
<tr>
<td>ESS score</td>
<td>14.7±3.9</td>
<td>7.6±3.4</td>
<td>15.5±4.7</td>
</tr>
</tbody>
</table>

Values are means±SD. nCPAP, nasal continuous positive airway pressure; AHI, apnea-hypopnea index; Ar/Awl, arousal/awakening index; WASO, wake after sleep onset; REM, rapid eye movement; TST, total sleep time; ESS, Epworth Sleepiness Scale; NS, non-significant. Groups were compared using two-way ANOVA. Treatment with nCPAP had significant effects on AHI, time spent with SaO2 below 90%, Ar/Awl, slow-wave sleep, REM sleep, and ESS but not on TST or WASO, as compared with baseline. No differences were found between conventional nCPAP and auto-nCPAP initiated at home.
patients who could not tolerate auto-nCPAP discontinued this treatment before the final adjustment. One patient in the auto-nCPAP group experienced poor tolerance during the first week, accepted to switch to conventional nCPAP therapy, and completed the study. Although mean pressure was lower in the auto-nCPAP group than in the conventional nCPAP group (8.7±1.7 vs. 11.7±2.5 cm H₂O, respectively; P<0.001), the tolerance questionnaire scores in study completers were similar in the two groups: 18.8±10.5 with conventional nCPAP vs. 22.9±5.8 with auto-nCPAP (NS) (lowest possible score, reflecting excellent tolerance: 0; highest possible score, reflecting very poor tolerance: 60).

**Efficacy of nCPAP Therapy on Sleep-Disordered Breathing, Sleep Quality and Daytime Sleepiness**

Both nCPAP modes produced comparable significant improvements in sleep respiratory parameters such as AHI and nocturnal oxygenation (Table 1). Sleep structure as assessed by the arousal/awakening index (Ar/AwI) and the amount of time spent in slow-wave or rapid eye movement sleep was largely restored in both groups, although the amount of slow-wave sleep remained subnormal in both groups. There was no significant difference between conventional nCPAP and auto-nCPAP regarding effects on sleep parameters. The ESS scores showed similar improvements in daytime sleepiness in the two groups.

Individual AHI values at baseline and with nCPAP therapy are given in Figure 1. The AHI returned to normal (=10 per hour of sleep) in 11 of the 14 study completers in the conventional nCPAP group. Of the 3 remaining patients, 1 had an AHI slightly above normal (11 per hour of sleep) but 2 had an AHI greater than 20 per hour of sleep. This non-effective nCPAP was ascribable in 1 patient to failure to determine the effective nCPAP pressure level during the overnight polysomnography; the other patient was unable to tolerate the effective nCPAP pressure, which was consequently decreased by 2 cm H₂O as recommended by Séries et al. In the auto-nCPAP group, AHI returned to normal in 12 of the 16 study completers; of the 4 remaining patients, 2 had an AHI value of less than 15 with nCPAP, most of the remaining respiratory events being hypopneas.

Finally, analysis of the questionnaires showed that all the patients but 2 in the conventional nCPAP group and all but 1 in the auto-nCPAP group were “satisfied” or “very satisfied” with their nCPAP treatment. The 3 remaining patients had no opinion and felt no improvement with nCPAP.

**Compliance with nCPAP**

As shown in Figure 2, compliance with nCPAP as assessed by the cumulative duration of CPAP use during the 2-month study period was adequate according to French National Health Insurance criteria (3 hours per night) in the 14 patients in the conventional nCPAP group and in 13 of the 16 patients in the auto-nCPAP group. The mean duration of nCPAP use was not significantly different in the two groups but tended to be longer in the conventional nCPAP group (5.3±1.4 vs. 4.5±1.7 hours per night with the auto-nCPAP; NS).

**Cost of nCPAP Therapy**

Patients who prematurely exited the study were included in the cost analysis. All costs in the patient who switched from auto-nCPAP to conventional nCPAP were imputed to the auto-nCPAP group. As shown in Table 2, hospital costs were significantly lower in the auto-nCPAP group, in which all the patients but 1 had a single polysomnography study at the sleep laboratory. Telecommunication costs were significantly higher in the auto-nCPAP group because of the modem transmission of nCPAP data from the home to the sleep laboratory. Costs of materials and home visits by the nurse were comparable in both groups. The total cost of the 2-month treatment was significantly lower in the auto-nCPAP group than in the conventional nCPAP group.

**DISCUSSION**

The aim of this study was to conduct a randomized comparison of constant (conventional) nCPAP and of automatically adjusted nCPAP (auto-nCPAP) without a titration polysomnography study in the laboratory. In earlier studies, auto-nCPAP and constant nCPAP were equally effective in correcting sleep-disordered breathing and daytime sleepiness; furthermore, compliance with the two treatments was similar. The present study confirmed these data and showed that auto-nCPAP used

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Cost of nCPAP therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Conventional nCPAP</td>
</tr>
<tr>
<td>Hospital care (€)</td>
<td>1220 ± 317</td>
</tr>
<tr>
<td>Equipment (€)</td>
<td>396 ± 181</td>
</tr>
<tr>
<td>Telecommunication (€)</td>
<td>9 ± 5.5</td>
</tr>
<tr>
<td>Home visits by the nurse (€)</td>
<td>95 ± 55</td>
</tr>
<tr>
<td>Total cost (€)</td>
<td>1720 ± 455</td>
</tr>
</tbody>
</table>

Values shown are costs in Euros (€) per subject at the end of the 2-month study, reported as means±SD. Hospital costs included the cost of one or more polysomnography studies at the sleep laboratory (excluding the first diagnostic polysomnography) and the capital cost of the bed used. Equipment costs included the costs of the nasal mask(s), mask strap(s), inspiratory circuit, expiratory valve, and humidifier but not the cost of the nasal continuous positive airway pressure (nCPAP) device, which was identical in the two groups. Telecommunication costs included the costs of telephone calls and of the modem. The cost of a modem is about 145 €; thus, the difference in telecommunication costs is entirely attributable to the investment in a modem. The costs of home visits by the nurse reflected the number of hours spent by a nurse visiting the patient at home (4.16±2.40 vs. 5.87±3.26 hours for conventional and auto-nCPAP, respectively; NS), as well as the cost of nurse transportation by car.

** ** P<0.01, *** P<0.001; significantly different from the conventional nCPAP group.
fewer financial and sleep laboratory resources than did constant nCPAP. In addition, auto-nCPAP reduced the time from diagnosis to treatment initiation from more than 6 weeks to 2 weeks.

Before discussing the implications of our findings, a number of methodologic issues need to be addressed. During the study period, 63 patients were treated with conventional CPAP but were not included in the study. Reasons for noninclusion were absence of a conventional phone (for the modem), unavailability of the modem (one per center), and an AHI below 30 per hour (7 patients). Despite this last criterion, nonincluded patients did not differ from included patients in terms of AHI (AHI in the nonincluded patients, 53.8±21.7-h⁻¹; unpaired t test: P=0.27). Nevertheless, our noninclusion criteria probably introduced some degree of recruitment bias, and we cannot extrapolate our findings to populations with less severe OSAS characterized by an AHI <30. Because our patients were not blinded to nCPAP mode, our finding on time to final treatment is open to question. However, time to final treatment was not an evaluation criterion in our study, and the reduction was discovered unexpectedly at the end of the study. Furthermore, at none of the sleep laboratories was any attempt made to reserve sleep nights for the study. Reasons for noninclusion were absence of a conventional CPAP initiation from more than 6 weeks to 2 weeks. Failure to determine the optimal nCPAP pressure level may result in nCPAP failure, more frequent outpatient visits for nCPAP problems, and a need for further sleep studies, thus canceling out the initial cost savings.

Coppola and Lawee⁹ suggested an attractive approach for treating OSAS, in which nCPAP pressure is adjusted over several nights at home based on reports of symptoms by both the patient and the bed partner. Ambulatory recordings of cardiorespiratory variables confirmed that the pressure thus determined was effective. However, the patients were selected, raising the possibility that this method may not be appropriate in all patients. In addition, methodologic weaknesses⁹ may include the adjustment of nCPAP in a somewhat arbitrary fashion based on subjective reports of reduced snoring and daytime sleepiness and the absence of data on sleep architecture and arousal rates. Nevertheless, this retrospective study is the first formal study of nCPAP treatment not initiated at a sleep laboratory.

Sériès et al²⁰ were among the first investigators to initiate auto-nCPAP at home without a titration sleep study. They demonstrated that auto-nCPAP can be used within a pressure range extending from 3 cm H₂O above to 4 cm H₂O below a reference pressure level calculated using a formula that includes anthropometric parameters and OSAS severity indices. We used a very similar approach in our auto-nCPAP group, except that the reference pressure was the pressure required to prevent snoring. In earlier studies, this method based on snoring alone did not result in use of excessive pressure levels.⁶,⁷ Similarity to Sériès et al,²⁰ we found that auto-nCPAP was as effective as conventional nCPAP. Furthermore, we observed decreases in the cost of treatment initiation and the time from diagnosis to nCPAP in the auto-nCPAP group, as compared to the conventional nCPAP group. The difference in the cost of the first 2 months of treatment was about 500 Euros. We used the mean costs of polysomnography, a follow-up visit, and the equipment needed for nCPAP initiation established in a recent study²⁰ to estimate the total cost saved.

Although objective treatment compliance evaluated on the basis of cumulative nCPAP use recorded by a microprocessor in the device was the same with both modes, it was lower than in some recent studies.²⁵ This discrepancy may stem from differences in experiment design. First, duration of use is measured more accurately by the device than by the time counter method, in which errors of up to 30 minutes can occur. Compliance in our study was similar to that in a study designed to provide an objective measurement of patterns of CPAP use.²⁶

Over the past few years, several strategies have been suggested to improve the cost-effectiveness of nCPAP and to shorten waiting lists in sleep laboratories. One of these strategies is a single split-night study for the diagnosis of OSAS and nCPAP titration. However, Sanders et al¹⁷ found that the nCPAP pressure level determined during the split-night study had to be changed in as many as 45% of patients. In keeping with this finding, Yamashiro and Kryger⁵ reported that the effective nCPAP pressure level was underestimated during a split-night study in 58% of patients.}

**Table 3—Estimated costs of conventional nCPAP and auto-nCPAP in North America**

<table>
<thead>
<tr>
<th></th>
<th>Conventional nCPAP</th>
<th>Auto-nCPAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital care ($)</td>
<td>2170 ± 468</td>
<td>1256 ± 642 **</td>
</tr>
<tr>
<td>Equipment ($)</td>
<td>1100</td>
<td>1420</td>
</tr>
<tr>
<td>Follow-up office visit ($)</td>
<td>181 ± 78</td>
<td>241 ± 138</td>
</tr>
<tr>
<td>Total cost ($)</td>
<td>3451 ± 449</td>
<td>2917 ± 620 **</td>
</tr>
</tbody>
</table>

Values shown are costs US dollars ($) per patient at the end of the 2-month study, reported as means ±SD. These estimates were based on a recent North American study of the costs of polysomnography, a follow-up visit, and equipment for nasal continuous positive airway pressure (nCPAP) initiation.²⁰ In this study, the cost of polysomnography was about $1190. We assumed that the nurse visits could be replaced by office visits ($70 per visit) and that the cost difference between the auto-nCPAP device and the conventional-nCPAP device (including the nasal mask, headgear, and filters) would not be above the range ($5100 to $14200) suggested by this study.²⁰ The cost of phone calls was not taken in account because it was very small and similar with the two treatment methods. The cost of the modem was not included in the total cost, as a modem can be considered an investment for the sleep laboratory. Although these assumptions probably led us to overestimate the cost of auto-nCPAP, we found a significant difference of about $500 in favor of auto-nCPAP.

**P<0.01, ***P<0.001: significantly different from the conventional nCPAP group.**
of the 2-month treatment with both methods in North America (Table 3). We found a significant difference between the two methods of about $500.

More importantly, patients treated with auto-nCPAP required fewer polysomnography studies. Thus, more widespread use of auto-nCPAP would probably shorten polysomnography waiting lists. Furthermore, elimination of the need for a titrating polysomnography study translated into a shorter time from diagnosis to nCPAP in the auto-nCPAP group. This is an important advantage given that OSAS is a significant independent contributing factor to traffic accidents and that nCPAP considerably reduces the traffic accident risk in OSAS patients. Most of our patients were drivers, and French law, as in some states of the United States of America, prohibits patients with untreated OSAS from driving; these facts underscore the importance of initiating nCPAP promptly in patients with OSAS.

To improve compliance with nCPAP, it is essential that the patient be able to discuss the treatment with a healthcare professional. The professional should explain the principles of nCPAP, emphasizing that the nCPAP device adapts to the patient, not the opposite. A wide range of masks are available, and great care should be taken in choosing the model best suited to the patient. The final objectives of nCPAP are well-being, improved quality of life, and full compliance. In our study, the patients in the auto-nCPAP group, who had no prior experience with nCPAP, received education at their home by a nurse who provided detailed explanations and demonstrated proper use of the auto-nCPAP device. However, this educational intervention may be less effective than the education received during a titration polysomnography study. This may explain the nonsignificantly poorer compliance in the auto-nCPAP group as compared with the conventional nCPAP group. Nevertheless, evidence has been reported that a simple intervention can improve compliance with nCPAP. However, the cost of such an intervention was not included in our analysis.

The data from this study suggest that auto-nCPAP can obviate the need for nCPAP titration, thus shortening polysomnography waiting lists, allowing prompt nCPAP therapy, and reducing the total cost of nCPAP therapy. Further studies are needed to evaluate the cost-effectiveness ratio of auto-nCPAP initiated at home and to compare it to other cost-saving and simplified strategies, such as the split-night strategy.

REFERENCES


