

How to Improve Adherence to Continuous Positive Airway Pressure Therapy?

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ABSTRACT

Obstructive sleep apnea (OSA) is a heterogeneous disease with a wide spectrum and diversity. Impact of OSA is multi-systemic with predisposition to cardiac, neurological, metabolic, endocrinological, neurocognitive, and psychiatric disorders. The continuous positive airway pressure (CPAP) device has a strong recommendation in treatment of OSA. Of the patients prescribed CPAP, 5–50% are nonadherent. Various patient-, clinician-, and therapy-related barriers affect CPAP adherence. Continuous positive airway pressure adherence can be improved by focusing on the multidisciplinary aspects like (1) education and counseling, (2) intensive patient support, (3) behavioral interventions, (4) spousal collaboration, (5) machine- and interface-related issues, (6) conservative measures, (7) and newer adherence monitors. Thus providing holistic management in OSA.

Keywords: Continuous positive airway pressure, Counseling, Mask.

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INTRODUCTION

Obstructive sleep apnea (OSA) is characterized by cessation of airflow in presence of breathing efforts during sleep. Obstructive sleep apnea associated with excessive daytime sleepiness (EDS) is referred to as obstructive sleep apnea hypopnea syndrome (OSAHS). Obstructive sleep apnea is a heterogeneous disease with a wide spectrum and diversity reported from India. The prevalence ranges from 2 to 5%.¹ A multivariate etiology contributes to the equally multitudinal pathophysiology of OSA. The impact of OSA is multisystemic with predisposition to cardiac, neurological, metabolic, endocrinological, neurocognitive, and psychiatric disorders. Obstructive sleep apnea therapy is vital considering the economic costs of comorbidities and impact on the quality of life (QoL). Obstructive sleep apnea diagnosis requires a polysomnography (PSG) testing with determination of the apnea-hypopnea index (AHI). Positive airway pressure therapy using a continuous positive airway pressure (CPAP) device has a strong recommendation in treatment of OSA.¹

BENEFITS OF CONTINUOUS POSITIVE AIRWAY PRESSURE THERAPY

Continuous positive airway pressure therapy is prescribed for treatment of OSA in conjunction with other general measures like lifestyle modification, weight reduction, exercise, sleep hygiene, and management of comorbidities. The patient-oriented benefits from CPAP include improved cognitive function and QoL; reduction of daytime sleepiness, risk of accidents, healthcare costs, blood pressure, and cardiac arrhythmias; improved glucose tolerance; and reduced mortality and risk of comorbidities. These positively impact the patient, patient's families, communities, and the healthcare settings. It also improves the bed partner's quality of sleep, QOL, health status, and relationship. Reducing risk of accidents and poor job performance benefits the community indirectly. It is estimated that 567,000 collisions and 980 fatalities annually could be avoided by effective CPAP treatment. Eventually, proper CPAP therapy decreases the healthcare system costs as it reduces follow-up care required for comorbidities associated with untreated OSA.²

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CONTINUOUS POSITIVE AIRWAY PRESSURE ADHERENCE

Adherence is defined as the extent to which an individual follows an illness-related recommendation. Adherence failure to CPAP is defined as use of CPAP for ≤ 4 hour per night for 70% nights or lack of symptomatic improvement. The literature documents that 5–50% of patients prescribed CPAP either discontinue the therapy or are nonadherent. Discontinuation mostly occurs at onset of therapy.

Various factors affect CPAP adherence. These multitude factors include subjective sleep-related symptoms, OSA severity, knowledge of CPAP's effects, adverse effects, and upper airway anatomy (Fig. 1). These barriers can also be simply classified into (1) patient related, (2) therapy and equipment related, and (3) clinician related. The patient-related factors include patient characteristics like ethnicity, disease and symptom severity, increased nasal resistance (sinusitis), education about therapy benefits, patient perception of benefits, social support, partner interaction, comorbidities, and psychological factors. The therapy-related side effects of CPAP like aerophagia, pressure ulcerations, skin changes, and claustrophobia also affect CPAP adherence. The clinician-related barriers include poor patient relationship, lack of clinician follow-up, expression of doubt concerning therapeutic potential or creating falsely elevated expectations, unwillingness to educate patient, and lack of knowledge on patient's medical history and other medications of the patient.³

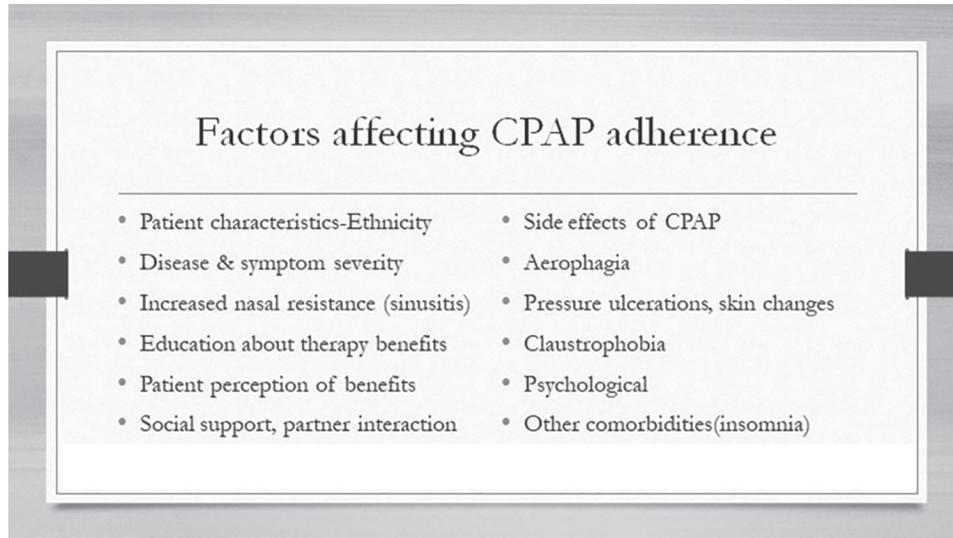


Fig. 1: Factors affecting continuous positive airway pressure adherence

Various parameters may be used to assess adherence. These include assessment of the therapeutic response, improvement in symptoms of snoring and EDS, and control of comorbidities like hypertension, diabetes mellitus, and metabolic syndrome. The patient description of benefit from CPAP can help gauge adherence. The CPAP devices are now enabled with advanced technology like tracking systems, smart card-SD cards, memory sticks, cable or wireless transmission to check the usage, leak, residual AHI, and detect the abnormal presence of any Cheyne–Stokes breathing, vibratory snoring, flow limitation, and central sleep apnea.⁴

HOW TO IMPROVE CONTINUOUS POSITIVE AIRWAY PRESSURE ADHERENCE?

Improving CPAP adherence needs to focus on the multidisciplinary aspects like (1) education and counseling, (2) intensive patient support, (3) behavioral interventions, (4) spousal collaboration, (5) machine- and interface-related issues, (6) conservative measures, and (7) newer adherence monitors.⁵

EDUCATION AND COUNSELING

Education and counseling about the disease in wholesome is the first step toward empowering and encouraging therapy adherence in patients. This can be achieved through group sessions, outpatient, or telephonic visits. Sharing written literature and presentations or audiovisual programs for patient education are other modalities to educate patients. The treatment provider needs to inform the patient about the definition, pathophysiology, and diagnosis of OSA in an understandable language. One should also discuss consequences of untreated OSA at length. These include health risks and personal cost involved. The therapy education should highlight the purpose, definition of CPAP, and benefits of CPAP therapy. All doubts of patients should be clarified. Alternative treatment options must be discussed. Remedies to common CPAP problems also should be addressed.⁶

INTENSIVE PATIENT SUPPORT

After initiation of CPAP therapy, an intensive patient support should be available with frequent office visits, telemonitoring, and phone

conversations to allay all queries arising anew. The assessment of CPAP compliance report on parameters like the mask use hours per night, amount of mask leak time, and AHI offers an opportunity for objective assessment at the physician end. Every patient should be given a feedback and motivation based on the compliance report generated. Repeated addressal of common side effects with CPAP and remedies for the same is encouraged. The clinic must do an equipment review to ensure the patient has up-to-date supplies and replacements. Mask fit should be checked to ensure the patient's comfort with the mask. A correct technique of using and wearing the mask should be ensured.

BEHAVIORAL INTERVENTIONS

Behavioral interventions have been studied in various aspects of OSA. Cognitive behavioral therapy (CBT) or motivational enhancement therapy (MET) on CPAP is a theory-driven approach based on the principles of motivational interviewing, which aims to elicit critical thought in the patient regarding his or her ambivalence toward treatment and highlight the patient's own motivating statements around therapy. An alternative, potentially more feasible, approach targeting the same mechanistic pathway (self-efficacy) involves patients experienced with CPAP to provide with support and encouragement to others. Availability of the social support has been positively associated with CPAP adherence.⁷

SPOUSAL COLLABORATION

Spousal involvement, supervision, and collaboration has been studied to improve CPAP adherence. Spousal involvement has been documented to increase CPAP compliance. The spouse should encourage the patient to use CPAP nightly and help to clean the machine and equipment appropriately. Collaboration showed the most effect when the spouse and the patient worked together to solve the problem.⁸ Studies by Baron et al.⁹ and review by Ye et al. reiterate these facts.¹⁰

MACHINE- AND INTERFACE-RELATED PROBLEMS

Continuous positive airway pressure-related problems should be tackled practically so that the patient has no discomfort

using the device. The complexity of use should be simplified and demonstrated practically as per patient's understanding for better compliance. The home support can be provided in the initial days of therapy initiation. Comorbidities like allergic rhinitis and gastroesophageal reflux disease should be adequately treated to avoid discomfort with therapy. Mouth leak can be addressed by using a oronasal mask. Heated humidification may be used to tackle dryness after use. Advanced comfort features with newer CPAP devices like Ramp, quieter blower, battery backup, expiratory pressure relief, and leak compensation are recommended to make the interaction more pleasant. An excessive hose length should be avoided. Various machine designs of bilevel PAP, auto CPAP, and flexible CPAP should be clarified to the patient. The expense of various therapy devices and coverage by local healthcare provider should be explained. Interface-related problems arise due to the gamut of interfaces available in therapy. However, the final choice of the interface selection should be as per patient convenience. Improper mask fit that may cause leaks should be addressed. Adverse reactions that go unaddressed like nasal dryness or dry eyes, nasal congestion, nasal bleeding, and skin irritation should be treated adequately.¹¹

CONSERVATIVE MEASURES

Conservative measures should always be incorporated with CPAP use. These include sleep hygiene, adequate sleep, and avoidance of sleep deprivation. Sleeping in the lateral position and elevating the headend could be beneficial. Excessive use of alcohol or other sedatives should be avoided. Diet and exercise to maintain an ideal body weight is crucial. Personnel in driving occupations should be counseled on the risks of driving while sleepy during every encounter.

NEWER ADHERENCE MONITORS

In addition to the multidisciplinary approach to improve CPAP adherence, newer monitors targeting the psychosomatic aspects and technological advances to gauge the same have been reviewed. These include (1) Conner's continuous performance test, (2) psychomotor vigilance testing of professional drivers in the occupational health clinic, and (3) telemedicine adherence interventions—Web-based feedback, smartphone app. The Conner's continuous performance test has been used to test the vigilance of patients before CPAP use and again 12 weeks after use had been initiated. The test consists of letters being flashed on a computer screen in rapid succession. Subjects are asked to press a response key when they see the letter X, but only when it is preceded by the letter A. This AX condition is thought to maximize the cognitive load of vigilance over and above that of

simple reaction time. The test lasts about 12 minutes and provides measures of accuracy and speed of target detection. Dependent measures include the total number of hits, average reaction time to targets, d' (a measure of signal sensitivity), and the total number of target omissions. This vigilance testing provides a criterion for assessing CPAP adherence.

CONCLUSION

Obstructive sleep apnea is a multivariate disease with CPAP therapy being the current gold standard of care. The education about the disease, counseling about effects of untreated OSA, and elicitation of the benefits of CPAP therapy are the cornerstones to improve CPAP adherence, which eventually aim at holistic care.

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