

Mini Review

Influencing Factors and Care Strategies of CPAP Treatment Adherence in Patients with Co-Morbid Insomnia and Sleep Apnea

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Influencing Factors

Disease factors: Studies have shown that basic indicators such as daytime sleepiness, sleep Apnea-Hypopnea Index (AHI), and nocturnal oxygen saturation decrease are associated with CPAP compliance [7]. However, there is also literature that does not find a correlation between AHI, the disease severity indica-

Abstract

The number of patients with chronic insomnia combined with Obstructive Sleep Apnea (OSA) has gradually increased recently, however, the adherence of CPAP therapy was suboptimal for Co-Morbid Insomnia and Sleep Apnea (COMISA) individuals. The purpose of our review was to assess the factors of poor adherence of CPAP therapy and provide the nursing care strategies for good adherence. In our review, cognitive behavioural therapy and continuous positive airway pressure treatment, individualized and continuum care measures were introduced for good adherence for CPAP therapy.

Keywords: Obstructive Sleep Apnea; Insomnia; CPAP; Adherence; Care strategies

Obstructive Sleep Apnea (OSA), a common disease of sleep respiratory disorders, is characterized by repetitive narrowing and closure of the upper airway during sleep [1]. OSA induces transient hypoxia and hypercapnia, as well as frequent cortical arousal and fragment sleep. Insomnia is characterized by frequent self-reported difficulties initiating sleep, maintaining sleep, and/or undesirable early morning awakenings during sleep at least three times a week. The duration of chronic insomnia is more than three months. Moreover, concentration difficulties and fatigue are associated with the poor sleep. Insomnia and OSA commonly co-occur [2]. In one study, 43% of insomnia patients fulfill the diagnostic criteria for OSA, and 50% of 231 OSA patients illustrate significant insomnia symptoms [3]. Compared with insomnia or OSA alone, COMISA is more harmful to the sleep quality, inducing fatigue, cognitive impairment and quality of life [4].

Continuous Positive Airway Pressure (CPAP) therapy was the first-line treatment for moderate to severe OSA patients [5], while the cognitive behavioral therapy for insomnia (CBTi) was the first-line treatment for insomnia patients. However, CPAP treatment remains ineffective due to low levels of acceptance and sub-optimal nightly adherence [6]. How to improve the acceptance and adherence of CPAP therapy, especially with the CBTi of COMISA, is a vital topic for future studies. The role of nurses in improving the acceptance and adherence of CPAP therapy, particularly with CBTi, is also discussed in our review.

tor of OSA patients, and CPAP treatment compliance [8,9]. Previous studies on COMISA patients have confirmed that after receiving CPAP treatment, only difficulty in maintaining sleep was improved, while difficulty in falling asleep and early awakening symptoms were not significantly improved, which is associated

with reduced compliance with CPAP treatment [10,11]. In addition, COMISA patients will apparently experience psychological and mental disorders such as excitement, fear, hallucination, and depression, which affect the treatment compliance of patients [12].

Cognitive factors: (1) Patients do not pay attention to their own physical symptoms; surveys have found that patients have low awareness of the disease, with 53.6% of them believing that snoring is a disease, while only 47.8% of them needing treatment [13]. (2) Patients lack correct recognition of obstructive sleep apnea-hypopnea syndrome. The current study indicated that even the higher educated and urban populations in China had insufficient knowledge about positive attitudes toward and practices regarding OSA [14]. (3) Patients lack correct perception of CPAP. In terms of psychological characteristics, COMISA patients have inappropriate sleep-related cognition and behavior, sleep-related anxiety and behavioral cognition [15]. (4) Patients have stigma towards obstructive sleep apnea-hypopnea syndrome. In the family environment, the noise caused by snoring also affects the sleep quality of cohabiters [16].

CPAP treatment factors: During the treatment process of patients, the increase of airway pressure will lead to suffocation, especially when the ventilator pressure is suddenly increased, which leads to the shortening of the time for pressure raising, and then the patients are prone to be kept awake. A small number of mild OSAHS patients may also aggravate the symptoms of insomnia after PAP treatment [17]. According to statistical data, the suffocation caused by pressure discomfort accounts for 25%. At the same time, the ventilator will also cause greater noise, which affects the sleep quality of patients to a certain extent. Other common influencing factors are: (1) discomfort of the nose mask. (2) Tightness of the headband. (3) Damage to the nose and face skin. (4) Some patients cannot sleep because of wearing the mask. (5) Some patients have dry throat, headache, nausea and many other problems. It has been reported that patients with dryness and discomfort in the oral nasopharyngeal cavity rank the first [18], and patients complain of strong irritation, pain and discomfort in the oral nasopharyngeal cavity after getting up in the morning, which leads to interruption or abandonment of treatment. On the other hand, insomnia symptoms in COMISA patients are not the same. Previous studies have also confirmed that OSA patients with insomnia only improved the difficulty in maintaining sleep after receiving CPAP treatment, and the difficulty in falling asleep and early wakening symptoms were not significantly improved, which is related to the decreased compliance with CPAP treatment [19]. Although CPAP treatment can alleviate insomnia in COMISA patients, there are still half or more patients with persistent moderate to severe insomnia symptoms. Therefore, individualized treatment plans need to be developed for different clinical subtypes, and nursing intervention should be carried out according to the differences in the first response to CPAP treatment [20].

Nursing Interventions

Pressure Titration Care: Pressure titration, also known as pressure setting, involves determining an appropriate level of pressure to ensure optimal therapeutic effectiveness and patient comfort, thereby promoting patient compliance. The focus is on selecting the appropriate ventilator treatment mode and parameters based on the patient's individual complaints and treatment outcomes. (1) Mask Selection: When treating patients with obstructive sleep apnea hypopnea syndrome, selecting the right mask is a crucial step. The mask should be chosen

based on the patient's facial contours to enhance comfort and prevent risks such as air leakage and nasal indentation injuries. The mask should be checked for normal ventilation and the patient's sleeping status observed to promptly detect any oral air leakage, and if necessary, anxiety reduction treatment can be administered to patients with machine-related anxiety [21]. (2) Airway Care: Systematic reviews for specific PAP delivery method were also performed and suggested that nasal interfaces compared to oronasal interfaces have improved adherence and slightly greater reductions in OSA severity [22]. When there is nasal congestion, some nasal spray can be used to alleviate airway resistance [23].

Cognitive behavioral therapy: Behavioral therapy and medication have almost equal efficacy in treating insomnia in about 70% of patients. During and after CBT-I treatment [24], patients with COMISA experience a significant reduction in insomnia symptoms, and overall improvement in severity of insomnia and daytime function indicators such as activity level, concentration ability, and memory. The combined use of CPAP and CBT-I is superior to CPAP alone in treating COMISA, significantly improving insomnia symptoms, consolidating sleep time, reducing the severity of OSA, but does not improve patients' compliance with CPAP treatment [24,25]. Therefore, in addition to treating insomnia symptoms, through Information-Motivation-Bbehavioral (IMB) techniques, patients are taught the dangers of the disease itself using multimedia methods to increase their awareness of OSA and its complications. In people with OSA, high-certainty evidence indicates that behavioural interventions yield a clinically-significant increase in hourly device usage when compared with usual care [26,27].

Telemonitoring intervention: After the patients get used to the treatment, the maintenance of positive pressure ventilation ventilator treatment could be basically carried out at home. Nursing staff should keep close contact with the patients and their families, and carry out long-term follow-up guidance to improve the patients trust in the treatment. At the same time, the development of a standardized treatment plan can be a good guarantee of the patients' compliance with the treatment. The application of "Internet+" nursing intervention can effectively improve the side effects of CPAP treatment, such as dryness of the oral cavity, nasal cavity, and throat, thus improve patients treatment compliance, but it could not significantly improve patients' difficulty in falling asleep, sleep maintenance disorders, and early awakening [8,29].

Based on the Internet platform, mainly using the WeChat platform as a connecting channel, the official account outputs continuous targeted health education resources and scientific knowledge, the patient management platform carries out the establishment of personal files, provides personalized care, reduces barriers to treatment in a timely manner or in advance, reduces or prevents the side effects of CPAP treatment, the patient feels cared about and valued, and promotes the self-efficacy of the patient. The ventilator intelligent platform manages and analyzes the time of CPAP used by patients, understands the reasons for the short time of use and implements interventions, reduces some of the therapeutic side effects of the patients, improves the comfort of the patients in treatment and thus improves the adherence to the treatment, and encourages family members to participate in the health management of the patients and improve the quality of life simultaneously.

In conclusion, general assessment was vital for patients with COMISA. Insomnia should be treated first and then CPAP

therapy could be conducted with good acceptance and adherence. Nurses play a role in general assessment, sleep monitoring, cognitive behavioural therapy and ventilator pressure titration treatment. Considering different clinical subtypes of OSA, holistic care of multiple care modalities and personalized care were necessary. The role of nurses is particularly important to assist to conduct cognitive behavioral therapy and CPAP for COMISA patients, which need to be continuously developed in clinical practice.

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