

Quality of Life and Public Health Issues in Patients Suffering from Obstructive Sleep Apnea Syndrome

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Abstract

Quality of Life (QoL) in patients with Obstructive Sleep Apnea Syndrome (OSAHS) is substantially reduced. OSAHS is as an important cause of morbidity and mortality as it is associated with a wide range of medical consequences (hypertension, cardiovascular diseases, psychological effects) and also accidents. Sleepiness, depression, fatigue and obesity have an important impact on QoL. Patients report problems in their social, professional and sexual relationships. Effective treatment of sleep apnea can improve the QoL of the patients and their families. As we live in an era of economic crisis cost effectiveness is crucial and in OSAHS the application of treatment with Continuous Positive Airway Pressure (CPAP) results in a significant reduction in healthcare costs, accidents and in an improvement of QoL of individuals and of society. This review focuses on the impact of OSAHS on quality of life and public health issues and the effectiveness of OSAHS treatment in these aspects.

Keywords: QoL; Public health issues; OSAHS

Introduction

Obstructive Sleep Apnoea/Hypopnoea Syndrome (OSAHS) is characterised by repetitive episodes of complete or partial airway obstruction leading to nocturnal sleep fragmentation and daytime symptoms (sleepiness). The prevalence of OSAHS in the middle-aged population ranges from 1-4% depending on research methods, equipment and study location. As obesity is increasing worldwide, the prevalence of OSAHS will probably also increase [1].

OSAHS has been recognized as an important cause of morbidity and mortality as it is associated with a wide range of medical consequences (hypertension, cardiovascular diseases, psychological effects) and accidents [2,3]. Sleepiness, depression, fatigue and obesity have an important impact on the person's quality of life. Patients report problems in their social, professional and sexual relationships, as well as concerns about poor memory and a fear of dying [4]. One of the most important complications of OSAHS which has the greatest impact from the public health perspective is driving accidents. Additionally OSAHS patients have an increased risk of work place accidents [5,6]. In this review we will focus on the impact of OSAHS on quality of life and public health issues.

Quality of Life and OSAHS

The term quality of life (QoL) refers to the general well-being of individuals and societies. Health-related QoL usually refers to the patients' perception of performance in somatic sensation, physical function, emotional state and social interaction.

Sleepiness, cognitive performance, and quality of life are interrelated aspects of daytime function for patients with OSAHS. Sleep apnea is the most common cause of excessive daytime sleepiness leading to significant impairments in QoL, cognitive performance and social functioning. The daytime consequences of OSAHS are usually more important to the patient than the nocturnal events on which clinicians tend to focus on [7]. Patients may be unaware of their nocturnal symptoms as snoring and breathing pauses, but they are aware of OSAHS consequences when awake as daytime sleepiness, decreased concentration, memory loss, impaired work performance, irritability, moodiness, depression, decreased libido and impotence, marital disharmony, reduced participation and enjoyment of everyday

activities [8]. Over 2/3 of patients with severe OSAHS have problems in their social and interpersonal function, especially in the areas of work performance, marital and family relationships [9].

OSAHS has independently been related to lower general health status before and after adjustment for age, sex, BMI, smoking status, alcohol usage and cardiovascular disease [10]. Many different instruments have been used to assess QoL of OSAHS patients [11]. Instruments have included the Nottingham Health Profile (NHP) [12], the medical outcomes study short form-36 questionnaire (SF-36), illness-specific scales as the Calgary sleep apnoea quality of life index (SAQLI) [13] and the functional outcomes of sleepiness questionnaire (FOSQ).

The American Academy of Sleep Medicine has recommended the Medical Outcomes Study Short-Form-36 (SF-36) as the most widely used instrument [14]. Even mild OSAHS was associated with decrements in SF-36 comparable to the magnitude of decrements linked to other chronic conditions such as arthritis, diabetes, and back problems [10]. QoL in OSAHS is substantially reduced, with limitations occurring both in mental and physical function. OSAHS patients have significant impairments in every domain of health-related QoL, with the most consistent impairments in the domains of sleep and vitality/energy. Sleep fragmentation may have an important role in the impaired aspects of QoL. Fatigue and excessive daytime sleepiness (EDS) may be partially associated with diminished QoL [15].

One of the chief consequences of impaired QoL may be minor psychiatric illness such as anxiety and depressive disorders. Depression is commonly reported in OSAHS and is a major component of

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impaired QoL. Patients with OSAHS who have depressive symptoms have particularly impaired emotional QoL scores and clinical interventions for mood symptoms may be warranted to improve their emotional QoL [16,17]. Patients with worse cognitive performance are more vulnerable to impairments in the physical domain of QoL as well and impairments in sustained attention and vigilance may be particularly determinative of impairments in the physical domain of QoL [18]. Inflammation in OSAHS patients may be an important factor to cognitive functioning and markers of chronic inflammation have been associated with diminished neuropsychological functioning in patients with OSAHS [19].

Patients with OSAHS (but also snorers) have more daytime sleepiness at work and worse performance in questionnaires concerning learning new tasks, concentration and performing monotonous tasks than subjects without OSAHS or snoring [20]. Work limitations were more present in the more sleepy patients compared to the less sleepy. This was independent from the severity of OSAHS but depended solely on the daytime sleepiness [21]. Sleepiness and hypoxaemia contribute to cognitive deficit. Patients with OSAHS and hypoxaemia had impaired mean performance scores on measures of attention, concentration, complex problem-solving and short-term recall of verbal and spatial information whereas patients who had OSAHS without hypoxaemia had no impaired scores. CPAP treatment may improve cognitive performance [22].

Studies have not consistently demonstrated a linear relationship between physiologic measures of OSAHS severity (i.e., apnea hypopnea index [AHI] or degree of nocturnal oxygen desaturation [ODI]) and the degree of impairment in health-related QoL. The limited correlation between the impairment of QoL and the severity of OSAHS reinforces the need for direct measurement of health status in OSAHS [16,23-25].

Bed partners of individuals with OSAHS also have impaired QoL due to sleep disruption from the patient's snoring, gasping, or choking respirations, or because of the bed partner's own concern about the patient's abnormal breathing [26,27]. The changes in patients' mood or character and decreased libido may also cause problems in relationships.

Treatment of OSAHS

Continuous Positive Airway Pressure (CPAP) has been the first-line treatment for OSAHS. Several studies have shown that CPAP decreases EDS, while improving neuropsychological function and QoL [28]. CPAP has beneficial effects on excessive daytime sleepiness and on self-reported functioning and well-being, affecting QoL. The low scores of SF-36 especially in the vitality/energy, role-emotional, mental health, and social functioning domains, improved after continuous positive airway pressure (CPAP) treatment. The use of CPAP in elderly patients reduced oxidative stress and improved their quality of life [29]. CPAP reduces subjective sleepiness and improves QoL of both patients and bed partners [24,30-35].

Other treatment options as the systematic use of mandibular repositioners improved the global quality of life (Calgary SAQLI) of patients with mild to moderate OSAHS [36]. Regular physical activity may help in the improvement of QoL as it has been found that OSAHS patients who performed regular physical activity for at least 2 h/week or more scored higher on all eight QoL domains of SF-36 than patients that were non-physically active [25].

Social Aspects of OSAHS

OSAHS represents not only a medical but also a social problem.

OSAHS is characterised by some degree of daytime sleepiness and this affects tasks requiring sustained attention, such as driving. Patients with OSAHS have more motor vehicle accidents than drivers in the general population. Motor vehicle crashes correlate with the degree of sleepiness and not the AHI. OSAHS represents a risk factor for road accidents which is estimated to be three to seven-fold of that of the general population. Almost 35.4% of male and 14.7% of female frequent drivers was found to have severe OSAHS [37]. This excess is negated when patients start and remain on treatment with CPAP [38-44].

A unified European Directive seems desirable as within the European Union there is still a lack of uniformity concerning driving license regulations. Despite the available scientific evidence, most countries in Europe do not include OSAHS or excessive daytime sleepiness among the specific medical conditions to be considered when judging whether or not a person is fit to drive. Drivers with undiagnosed OSAHS may freely drive within Europe. The basic legislation on driving and health was documented in Annex III of Directive 91/439/CEE which included a list of diseases that should be taken into account when someone was administering for a driving license. Annex III did not include OSAHS and the next amendment of the Directive (possibly into effect in 2013), remains silent about OSAHS. Rare conditions (e.g., narcolepsy) were considered a driving safety risk more frequently than OSAHS [44]. Non-governmental consensus conference had made recommendations for sleep apnea and commercial motor vehicle operators and when to allow drivers under evaluation to return to work [45]. These recommendations have high positive predictive value but have not been adopted by federal regulators and thus do not have the weight of law. Drivers with positive screening for OSAHS often fail to proceed for additional testing in the absence of legal requirements for follow-up and treatment [46].

Monitoring for patients with known OSAHS is controversial. Obtaining an EEG assessment for "microsleeps" during testing on a driving simulator has been suggested but is expensive and time consuming. Patients with OSAHS might use in-vehicle detection and alerting systems to help prevent crashes due to waning driver attention and alertness.

OSAHS also represents a causal factor for occupational and domestic accidents that decreased after CPAP use [47].

Public Health Issues

Patients with OSAHS have increased utilization of health resources with higher healthcare costs. Costs increase over time until diagnosis, decrease after the administration of an effective treatment and are related to the severity of the disease. Sleep apnea not only increases the actual number of road traffic accidents but also has an impact in with a wide range of medical consequences (hypertension, cardiovascular diseases, diabetes, metabolic syndrome, depression). Patients with more severe OSAHS spend more than less affected patients [48,49]. These increased costs may be attributable to cardiovascular, metabolic diseases and accidents [50].

OSAHS increases health costs when not been diagnosed but the cost-effectiveness improves after CPAP treatment as the cost remains stable but the benefits increase year after year. CPAP was found to be more effective than no treatment and proved to be a cost-effective strategy after a minimum of 2 years of treatment [51]. The cost of road accidents is an indirect health cost of OSAHS and their rate has been reduced with treatment, resulting in a further reduction of the indirect economic costs due to the disease [52].

Conclusion

OSAHS affects the QoL of patients, their families and the society and represents a major public health problem. Current available resources allow only a minority of affected patients to be assessed and treated. The application of treatment results in a significant reduction in healthcare costs, accidents and in an improvement of QoL of individuals and of society.

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