Sleep Disordered Breathing in Elderly: Current Evidence and Future Directions in Clinical Practice

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Sleep disordered breathing (SDB) is a common problem in the general population, and its prevalence in the community of middle-aged subjects varies depending on several factors such as age, sex, race, body habitus measures including body mass index, etc [1-6]. Most common treatment of SDB in the world that has been widely used is continuous positive airway pressure (CPAP) through CPAP device, surgery, dental device, and so on [7].

When practicing sleep medicine in clinics, we often find out there are still uncharted areas that are yet to be discovered and need further elucidations. Due to lack of scientific evidences, there might be confusion in making decisions and diagnosing patients with declining compliance of CPAP machine due to older age, individual variation of upper airway anatomy, chronic medical problems in addition to taking medications, and those who experience cumbersome usage of mask on the top of mouth, nose, inside nose like “nasal pillow” type mask, etc. We all have been experiencing the same issue in the clinics without any definite solutions for those issues and reasons why it happens sometimes. And it is demonstrated that patients with moderate-to-severe obstructive sleep apnea syndrome (apnea-hypopnea index > 15 and/or Epworth Sleepiness Scale score > 10) mostly have poor compliance to CPAP device [8].

In our research institute (“Institute of Human Genomic Study”), we followed almost 12 years of polysomnography and brain magnetic resonance imaging, following up with the same subjects every 4-year period and this follow-up has been done more than 3 times so far [9]. Our observations, incongruent to other studies, show that most of the subjects have positional sleep-dependent SDB, more than 80%–90%, as they get older. However, this observation needs to be studied more in the future. Positional sleep-dependent SDB can be one of the possible reasons for declining tolerance of CPAP usage and having drop-out rate of more than 50%–80% within 6–12 months [10]. Possible reasons for declining tolerance might be the result of supine sleeping position during CPAP or presence of comorbid conditions like arthritis preventing them from sleeping in lateral position.

There might be several other reasons for incompliance of CPAP machine. One of them most likely would be due to the aging process of many organs, including brain, and central nervous system which will possibly be blunted by neurodegeneration as they get aged. Subjects aged more than 75 years show declining trend in CPAP adherence possibly due to increasing proportion of comorbidities like neurocognitive impairment, difficulty wearing mask by oneself due to neurodegenerative diseases, insomnia, and stroke [11]. Therefore, they would not be able to feel the benefit of CPAP machine even though severity of sleep apnea and oxygen saturation level get improved objectively by follow-up and data from polysomnography. The amelioration in elderly subjects is comparably less obvious than young subjects which is probably attributable to neurodegeneration during aging process. This can possibly explain why the drop-out rate is relatively high and the acceptance rate is low in el-
elderly subjects compared to young [11,12].

One problem with elderly patients is that they have a higher prevalence of insomnia, which may be due to obstructive sleep apnea (OSA), as they get aged [13]. In those cases, the patients have to be treated both to increase the compliance to CPAP and increase the quality of sleep according to each individual, considering all the other chronic medical conditions, if present. To me, it’s a cocktail therapy for elderly care that has to be considered.

It is already well-known that OSA causes neurocognitive impairment, cerebrovascular accidents, metabolic syndrome, etc [14,15]. One possible case is accumulation of tau and beta-amyloid damaging brain therefore possibly contributing to increasing the chances of getting Alzheimer’s disease and dementia [16]. In fact, poor activity of glymphatic system has been observed in OSA subjects [16]. Furthermore, in order to prevent cerebrovascular events and diabetes, it is necessary to do the early intervention of SDB, about 10–20 years early [17]. Through early intervention, chronic diseases such as cerebrovascular accident, diabetes, and more can be prevented, however, if we do not treat severe sleep apnea syndrome, one may have stroke, lacunar infarct, and cerebral hemorrhage that worsen the cognitive functions, eventually ending up having dementia [18].

In order to approach the elderly with SDB, one may have to consider comparing them to younger subjects. As they get aged, in contrast to young subjects, there are notable changes in anthropometric conditions, such as a decrease in muscle mass and an increase in fat mass. Additionally, neurodegeneration varies among elderly subjects, and cerebrovascular events are more frequent in this population. Hence, for elderly subjects, treating SDB is not the only goal, but addressing the other possible age-related problems like neurodegenerative diseases, cardiovascular and cerebrovascular problems, cognitive deficits, and inactivity of daily living, through a cocktail therapy to improve one’s quality of life. If they have family, they have to be involved for support or help, and if needed, medical doctors from different departments can work together for additional medical consultations.

Availability of Data and Material
Data sharing not applicable to this article as no datasets were generated or analyzed during the study.

Conflicts of Interest
The author has no potential conflicts of interest to disclose.

Funding Statement
None

REFERENCES