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Sleep-disordered breathing and Alzheimer's disease: A nationwide cohort study

One person is diagnosed with dementia in Korea every 12 minutes. According to the Ministry of Health and Welfare, the number of patients with dementia in 2017 was estimated to be about 700,000 and is expected to increase rapidly to 1 million by 2024. According to the OECD report, Alzheimer's disease (AD) is the most common cause of dementia, accounting for approximately 60–80% of cases of dementia. AD is more common in aging populations. There has been a growing interest in AD and its modifiable risk factors, such as cardiovascular disease (CVD), hypertension, Type 2 diabetes mellitus (DM), depression, obesity, smoking, low physical activity, and drinking. Reducing these modifiable risk factors can prevent AD. Recently, an association between sleep-disordered breathing (SDB) and AD has been suggested. According to a previous study, the prevalence of SDB is estimated to be 27% and 16% in middle-aged Korean men and women, respectively. Recent studies have shown a direct association between SDB and cognitive impairment. However, the association between SDB and AD remains controversial, and only few longitudinal studies have been performed in an Asian population. Therefore, the present study was conducted to investigate whether SDB is associated with AD onset, using representative nationwide cohort data with a 14-year follow-up. The present study used the health check-up cohort data from the National Health Insurance Service (NHIS) claims between 2002 and 2015. The study population comprised about 10% of the 5.15 million subjects aged 40–79 years who participated in the national medical check-up between 2002 and 2003. The NHIS cohort data includes all claims data; general health examination results, which are updated every 2 years; and health examination results specified for life-turning points, such as reaching the age of 40 or 66 years between 2002 and 2015. Subjects who were diagnosed with AD (N=1,489) or died (N=5,489) between 2002 and 2005 were excluded from the cohort sample. The study population comprised individuals who were diagnosed with SDB and those without SDB who were matched by using propensity score. The matched cohort was followed up until the onset of AD, death, or end of 2015. The study groups comprised the SDB group (N=727) and the control group (N=3,635). The SDB group comprised patients who were diagnosed with SDB between 2002 and 2005. On the other hand, subjects without SDB were randomly selected to form the control group. Subjects without SDB were matched to subjects with SDB at a ratio of 5:1 by sex, age, index date (the date of first diagnosis), CVD, hypertension, type 2 DM, depression, body mass index (BMI), smoking status, physical activity, and drinking by using propensity scoring and the stepwise algorithm. The matched cohort was followed up until onset of AD, death, or end of 2015. The cohort data included information on demographic characteristics, medical utilization, medical check-up, and health behavior. After PSM, the chi-square test was used to assess differences in the proportions between the SDB and control groups. To estimate the influence of SDB on AD onset, Kaplan–Meier survival curves and multivariate Cox proportional hazard models were used. Kaplan–Meier curves of the incidence of AD based on the presence of SDB showed differences. The log-rank test showed that the SDB group had a higher risk of AD than the non-SDB group (log-rank test $p < 0.0422$). After adjusting for the possible confounding variables, patients with SDB were almost 1.58 times more likely to develop AD than those without SDB. The present study showed that SDB was associated with an onset of AD. The findings of this study highlight the importance of the interventions to raise awareness of SDB and the need for the government's support to reduce the barrier in accessing appropriate SDB treatment.

Biography

Seong Wu Yang is MD, currently training internal medicine residency in Bundang Jesaeng Hospital, South Korea. He pursued his graduation from Yonsei University, College of Medicine. He completed his Bachelor's degree of Business Administration from Hankuk University of Foreign Studies.

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