



Prevalence and clinical characteristics of insomnia and its subtypes in the Korean elderly



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ABSTRACT

Background: Insomnia is known to be associated with psychiatric disorders, other sleep disorders and medical conditions, but the prevalence of insomnia diagnosis has never been estimated according to its subtypes. We studied the prevalence and clinical characteristics of insomnia diagnosis and its subtypes in the Korean elderly population.

Methods: Among 1423 sampled elderly individuals aged 60 years or older, 881 subjects participated in this study. The Athens Insomnia Scale was applied to detect insomnia symptoms, and insomnia diagnosis was finally evaluated using the international classification of sleep disorders, 2nd edition. To define insomnia subtypes, the DSM-IV-based interview, detailed history on sleep disorders and semi-structured interview for medical conditions were performed. Subsyndromal depression was defined when depressive symptoms did not meet the criteria for depressive disorders.

Results: The prevalence of insomnia disorder was 32.8% in all subjects, with the prevalence being significantly higher in women than in men (37.9% vs. 25.2%; $p < 0.001$). The prevalence of insomnia subtypes was as follows; psychophysiological insomnia (PI), 20.5%; insomnia due to mental disorder 7.2%; insomnia due to general medical conditions 2.9%; insomnia in other sleep disorders 2.2%, and insomnia due to substance use 0.2%. Among subjects with PI, subsyndromal depression was diagnosed in 53.7%.

Conclusions: Nearly one third of Korean elderly individuals suffer from insomnia and insomnia patients showed diverse comorbid conditions, especially depressive symptoms. By establishing insomnia subtypes, we can plan to treat comorbid conditions as well as insomnia itself.

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1. Introduction

Insomnia is frequently observed in the general population (Ford & Kamerow, 1989; Ohayon & Smirne, 2002), and the prevalence of insomnia symptoms in the elderly has been reported to be

between 20 and 40% (Foley et al., 1995; Liu & Liu, 2005; Maggi et al., 1998; Ohayon, Zulley, Guilleminault, Smirne, & Priest, 2001). Although there are controversies whether aging is a risk factor of insomnia (Leger, Guilleminault, Dreyfus, Delahaye, & Paillard, 2000; Ohayon, 2002; Roberts, Shema, & Kaplan, 1999; Wong & Fielding, 2011), it continues to be considered as a big health problem in the elderly because at least one fifth of them suffer from this condition.

To date, most epidemiological studies in the elderly, including those from Korea (Cho et al., 2009; Kim et al., 2009), have focused on insomnia symptomatology including difficulty initiating sleep (DIS), difficulty maintaining sleep (DMS), early morning

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awakening (EMA) and non-restorative sleep (NRS), instead of using standard diagnostic criteria, such as the international classification of sleep disorders, 2nd ed (American Academy of Sleep Medicine, 2005). In addition, the prevalence of insomnia has never been estimated stratified by its subtypes in the elderly. Defining insomnia subtypes will give valuable clinical information and help to customize treatment strategy for better prognosis. It is well-known that depression and anxiety are closely related with insomnia in the elderly (Ohayon & Bader, 2010; Roberts, Shema, Kaplan, & Strawbridge, 2000; Wong & Fielding, 2011). In particular, up to 90% of patients with depression have shown poor sleep quality (Tsuno, Besset, & Ritchie, 2005) and insomnia has been associated with future depressive episodes (Pigeon et al., 2008; Roberts et al., 2000). Also, elderly insomnia can be associated with other sleep disorders such as circadian rhythm sleep disorders and sleep-related breathing disorders, poor general medical conditions (Vitiello, Moe, & Prinz, 2002) and substance abuse. If subtypes can be specified in insomnia patients, treatments for insomnia can become more efficient and successful by introducing treatments for comorbid conditions as well as for insomnia itself. That is, in psychophysiological insomnia, treatment of insomnia will be enough, but in other subtypes of insomnia, additional interventions such as antidepressant administration, light therapy and continuous positive airway pressure treatment, need to be applied. For example, treatment for depression and/or anxiety could improve comorbid insomnia symptoms in the patients with depressive and/or anxiety disorders (Mason & Harvey, 2014; Yon et al., 2014). This treatment consideration may support clinical utility of identifying insomnia subtypes.

Therefore, we investigated the prevalence and clinical features of insomnia disorder and its subtypes according to the ICSD-2 in the elderly Korean population. Characteristics of insomnia subtypes were studied in terms of sleep quality, depressive symptoms, daytime sleepiness and cognitive function.

2. Material and methods

2.1. Subjects

This study was part of the Osan Mental Health Survey by the Osan Community Mental Health Center. Osan-si is a city in Gyeonggi-do, Korea, and its population was 162,809 in February 2010. A simple random sample ($n=1588$) was drawn from the roster of 14,051 Korean people aged 60 years or older living in Osan-si. From the 1588 sample population, 165 people were excluded from the study population; 20 were dead, 55 moved and 90 were not living in Osan-si despite having Osan-si as their residential address. This study was approved by the Institutional Review Board, and all subjects provided written informed consent.

2.2. Study design

This study consisted of two phases, the screening phase and the diagnostic phase.

2.2.1. Screening phase

Elderly subjects were invited to visit the Osan Mental Health Center and fill out self-questionnaires with the help of three mental health professionals. If subjects could not come to the Mental Health Center because of physical disabilities or limited accessibility to transportation, the three mental health professionals visited their homes. The Athens Insomnia Scale (AIS) was applied to detect insomnia patients. The AIS was developed as a self-assessment psychometric instrument designed for quantifying sleep difficulties based on the ICD-10 criteria (Soldatos, Dikeos, & Paparrigopoulos, 2000). It consists of eight items and each item

is rated 0–3. When insomnia was diagnosed with a score of ≥ 6 , the sensitivity and specificity of the AIS were 93% and 85% with 90% overall correct case identification (Soldatos, Dikeos, & Paparrigopoulos, 2003). Thus, in the present study, 100% of the subjects with a score of ≥ 6 in the screening phase were invited to participate in the diagnostic phase. Among subjects with a score of < 6 , 10% of them were randomly selected and also recommended to complete the diagnostic phase.

2.2.2. Diagnostic phase

2.2.2.1. Diagnosis of insomnia and its subtypes. Two psychiatrists with expertise in sleep disorders, who acquired inter-rater reliability through pre-study, had face-to-face interviews with the subjects who were deemed eligible for the diagnostic phase. Insomnia was diagnosed according to the ICSD-2 criteria. Insomnia diagnosis was defined as: 1) A complaint of difficulty initiating or maintaining sleep or waking up too early or experiencing nonrestorative sleep; 2) Sleep difficulty occurs despite adequate opportunity and circumstances for sleep; 3) At least one of the following forms of daytime impairment to be suggested in ICSD-2 reported by the patient; fatigue/attention, concentration, or memory impairment/social or vocational dysfunction/mood disturbance/daytime sleepiness/energy or motivation reduction/proneness for errors/tension, headaches or gastrointestinal symptoms/concerns or worries about sleep (American Academy of Sleep Medicine, 2005). In addition, when insomnia subtypes were defined, the duration criteria of at least one month were considered, if required. Insomnia subtype was classified as causing factors including physical problem, sleep disorders, mental disorders, and psychophysiological aspect according to priority. First, coexisting another sleep disorders or medical condition known to be disrupted was evaluated. Sleep disorders such as circadian rhythm sleep disorder and sleep-related breathing disorder, medical conditions and the use of substances such as alcohol and cigarettes were evaluated by the two above-mentioned psychiatrists. They obtained detailed history on sleep disorders using the ICSD-2 and performed semi-structured interview to assess medical conditions and substance use. If not, mental disorder was diagnosed according to criteria of Diagnostic and Statistical Manual of Mental Disorder-IV. Major psychiatric disorders including major depressive disorder (MDD) were evaluated using the Mini International Neuropsychiatric Interview (MINI) version 5.0 (Sheehan et al., 1998). In diagnosing depressive disorders, MDD, minor depressive disorder (MnDD) and dysthymic disorder (DD) were defined based on the DSM-IV criteria. Subsyndromal depression (SDD) was diagnosed according to the following operational criteria: (1) two or more symptoms of depression occurring during the same 2-week period listed in the criterion A for major depressive episodes under DSM-IV; (2) at least one of the symptoms must be depressed mood or anhedonia; (3) each depressive symptom should be present for more than a half of day or more than seven days over two weeks; and (4) do not meet criteria for MDD, MnDD or DD (Jeong et al., 2012). Subjects with anxiety disorder was diagnosed excluding those with depressive disorders. Comorbid diagnosis was not performed in mental disorders. In diagnosis of psychological insomnia, finally, at least one of the following evidences of conditioned sleep difficulty or hyperarousal in bed to be suggested in ICSD-2 reported by the patient; excessive focus on and heightened anxiety about sleep/difficulty falling asleep in bed at the desired bedtime or during planned nap/ability to sleep better away from home/mental arousal in bed by intrusive thought/heightened somatic tension in bed. Although ICSD-2 does not define insomnia subtypes for insomnia which can be better explained by another sleep disorder, we included insomnia

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