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Prevalence of the Major Mental Disorders among the Korean Elderly

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With a rapidly aging society, geriatric mental health is emerging as important public health concern. Despite the short history of psychiatric epidemiology in Korea, recently, epidemiologic data regarding geriatric psychiatric problems has started to accumulate. In the current study, we reviewed epidemiological findings regarding geriatric mental health in Korea. It was found that up to 10% of the elderly suffer from dementia, and 10% to 20% from depressive disorder. Further, prevalence estimates of Alzheimer's disease ranged from 4.2% to 9.0%, and vascular dementia from 1.0% to 4.8%. Annual incidence rates for Alzheimer's were 2.7% to 3.4% whereas that for vascular dementia was found to be as low as 0.3%. The prevalence of major depressive disorder was 4.2% to 9.1%, while that of clinically significant depressive symptom was between 9.1% and 33.0%. Finally, those with alcohol use disorders were found to comprise up to 13.6% of elderly population and additionally, 22% to 58% of the elderly were found to have sleep difficulties. Thus major mental disorders are already prevalent among the Korean elderly and are likely to increase rapidly.

Key Words: Aged; Mental Health; Psychiatric Epidemiology; Dementia; Depressive Disorder; Korea

INTRODUCTION

The elderly population in Korea has been growing very rapidly. The elderly, defined as being 65 yr of age or older, made up just 3.8% of national population in 1980; since then, as we can see from the Table 1, the number and the proportion of the elderly population increased dramatically. The proportion of the elderly population almost doubled in just 20 yr (7.2% in 2000), and is expected to be doubled again by 2020. And with two more decades, the elderly population will probably reach one third of whole national population: that means, there will be fifteen million elders living in Korea by the year 2040, a ten-fold increase in 60 yr span (1). This speed of population aging may be one of the fastest in the developed world. Accordingly, the societal burden of geriatric psychiatric problems is growing rapidly. Based on recent surveys using standard structured interviews, researchers and policy-makers in Korea have begun to grasp the order of magnitude of these mental health problems. It has been estimated that up to 10% of the elderly population suffer from dementia, and 10% to 20% from depressive disorder, with considerable overlap between those two conditions. These prevalence estimates were somewhat unexpected based on those found in western countries, that is, higher prevalence of Alzheimer's disease, coupled with lower prevalence of depressive disorder. While these differences are of an academic interest, the sheer numbers

of patients that have already presented with these disorders, combined with expectations of many more in the near future, make geriatric mental health a very important emerging public health concern.

During the last two decades, there have been a number of well-conducted epidemiological studies in Korea. As such, in the present study, we have reviewed epidemiological findings regarding the geriatric mental health problems in Korean society, focusing on cognitive and mood disorders, with a brief summary regarding alcohol use and sleep disruption.

EPIDEMIOLOGY OF DEMENTIA IN THE KOREAN ELDERLY

Prevalence of dementia

As a society grows older, it is inevitable that there would be a steep increase in the prevalence of dementia. Further, it cannot be denied that dementia is one of the most burdensome diseases of the elderly. Thus, since the early 1990s, there have been a series of epidemiological studies on dementia in Korea (2-19), several of which were published in international journals (2, 3, 10, 12, 13, 16, 17).

The prevalence of dementia among the elderly population has been reported to range from 3.6% to 11.9% in Western countries (20-26) and 4.8% to 7.2% in Japan (27-30). With respect to

China, Dong et al. (31) analyzed 25 previous studies and reported the prevalence of dementia in China to be 3.1%, which was relatively low compared to developed countries.

Most previous studies reviewed here have used two-step approach, in which participants were screened by either the Korean version of the Mini Mental Status Examination (MMSE) or the Psychogeriatric Assessment Scale (PAS-K) (32, 33) in the first step and subsequently, diagnosed by a clinician in the second step. Two other studies used a single diagnostic step design: One

study used direct face-to-face interviews by psychiatrists (17), and another study diagnosed dementia using the 10/66 Dementia Research Group algorithm (15). Also, there have been several reports regarding the prevalence of cognitive impairment among the elderly, using only the Korean version of the MMSE as a diagnostic tool without an additional evaluation; they are not included in this review given limitations in their diagnostic method (34-36). In majority of studies, the National Institute of Neurologic and Communicative Disorders and Stroke and the Alzheimer's

Table 1. Korea population prospects

Age group	Year							
	1980	1990	2000	2010	2020	2030	2040	2050
Population in thousands (Proportion, %)								
0 to 14	12,951 (34.0)	10,974 (25.6)	9,911 (21.1)	7,907 (16.2)	6,118 (12.4)	5,525 (11.4)	4,777 (10.3)	3,763 (8.9)
15 to 64	23,717 (62.2)	29,701 (69.3)	33,702 (71.7)	35,611 (72.9)	35,506 (72.0)	31,299 (64.4)	26,525 (57.2)	22,424 (53.0)
65 or over	1,456 (3.8)	2,195 (5.1)	3,395 (7.2)	5,357 (11.0)	7,701 (15.6)	11,811 (24.3)	15,041 (32.5)	16,156 (38.2)
Total	38,124	42,869	47,008	48,875	49,326	48,635	46,343	42,343

Source: Korean National Statistics Office (1).

Table 2. Prevalence of dementia in the elderly population of Korea

Author	Year	Area	Type of area	Age	Sample size		Diagnostic criteria			Prevalence (%)			
					Initial	Completed	Dementia	AD	VaD	AD	VaD	Total
Park et al. (2)	1994	Yongil	Rural	65+	766	702	DSM-III-R	DSM-III-R	HIS	6.5 (n = 45)	1.3 (n = 9)	10.8* (n = 75)
Woo et al. (3)	1998	Yonchon	Rural	65+	2,171	1,674	DSM-III-R	NINCDS-ADRDA	HIS	4.5	2.5	9.5†
Cho et al. (4)	1998	Seoul	Urban	65+	1,187	447	DSM-III-R	–	–	–	–	10.6‡ (n = 38)
Kim et al. (5)	1999	Kwangmyung	Urban	65+	1,331	946	DSM-IV	NINCDS-ADRDA	DSM-IV	5.3	4.8	13.0†
Kwak et al. (6)	1999	Kwachon	Urban	65+	520	500	DSM-IV	–	–	8.0 (n = 40)	2.6 (n = 13)	10.6* (n = 53)
Cho and Hong. (7)	2000	Ulsan	Urban	65+	1,481	723	DSM-IV	DSM-IV	DSM-IV	5.3 (n = 35)	1.9 (n = 13)	8.1* (n = 54)
Bae et al. (8)	2001	Inchon	Urban	65+	1,967	853	DSM-IV	DSM-IV	DSM-IV	4.8	1.1	6.3§
Lee et al. (10)	2002	Seoul	Urban	65+	953	643	DSM-IV	NINCDS-ADRDA	NINDS-AIREN	5.4 (n = 25)	2.0 (n = 9)	8.2¶ (n = 40)
Shin et al. (11)	2002	Kwangju	Urban/Rural	65+	1,598	1,134	DSM-IV	NINCDS-ADRDA	NINDS-AIREN	5.7 (n = 59)	1.9 (n = 20)	10.7‖ (n = 110)
Kim et al. (12)	2003	Busan	Urban	65+	1,230	1,101	DSM-III-R	–	–	–	–	8.0† (n = 82)
Suh et al. (13)	2003	Yonchon	Rural	65+	1,217	1,037	DSM-III-R	NINCDS-ADRDA	NINDS-AIREN	4.2 (n = 45)	2.4 (n = 26)	6.8† (n = 74)
Shin et al. (15)	2005	Kwangju	Urban	65+	1,072	706	10/66 Dementia Research Group algorithm			–	–	11.5‖ (n = 92)
Choi et al. (18)	2008	Busan	Urban	65+	1,215	706	DSM-IV	NINCDS-ADRDA	NINDS-AIREN	9.0** (n = 16)	–	–
Jhoo et al. (17)	2008	Seongnam	Urban	65+	1,118	714	DSM-IV	NINCDS-ADRDA	NINDS-AIREN	4.8 (n = 28)	1.0 (n = 7)	6.3† (n = 37)
Cho et al. (19)	2009	Nationwide	Urban/Rural	65+	8,199	6,141	DSM-IV	NINCDS-ADRDA	NINDS-AIREN	5.9	2.1	8.4† (n = 351)

*Crude prevalence rate; †Age and sex were standardized to Korean population; ‡Authors stated that age and sex were standardized, without specifying target population; §Age and sex were standardized to the population structure of the surveyed area; ‖Age was standardized to the population structure of the surveyed area; ¶Age was standardized to Korean population; **Authors stated that prevalence was adjusted for the population of the surveyed area. AD, Alzheimer's disease; VaD, vascular dementia; NINCDS-ADRDA, National Institute of Neurologic and Communicative Disorders and Stroke and the Alzheimer's Disease and Associated Disorders Association; NINDS-AIREN, National Institute of Neurological Disorders and Stroke-Association Internationale pour la Recherche et l'Enseignement en Neurosciences; HIS: hachinski ischemic scale.

disease and Associated Disorders Association (NINCDS-ADRDA) criteria were used to identify Alzheimer's dementia (AD), and the National Institute of Neurological Disorders and Stroke-Association Internationale pour la Recherche et l'Enseignement en Neurosciences (NINDS-AIREN) criteria were used for vascular dementia (VaD). Adoption of NINCDS-ADRDA and NINDS-AIREN criteria in addition to that of the DSM-IV criteria may have brought about more conservative results.

Prevalence of overall dementia in Korea ranged from 6.3% to 13.0% (Table 2), while prevalence estimates of AD ranged from 4.2% to 9.0%, and those of VaD ranged from 1.0% to 4.8%. This means, as of year 2010, there may be between 300,000 and 700,000 demented elderly living in Korea. If we assume that the prevalence of dementia in the elderly population would remain stationary, by 2020, there will be more than a half million, may be up to a full million elderly suffering from various dementia. And by the year 2040, dementia as a whole would affect up to two million elders, and AD alone a million.

However, as we can see, there is quite variance in prevalence estimates. This variance in prevalence may have resulted from methodological differences, socio-demographic differences within the subject population, variable response rates, or varying degrees of awareness of dementia in caregivers. Even though several epidemiological studies in the neighboring country of Japan have reported higher prevalence rates of VaD than AD (27, 30, 37), studies from Korea and most Western countries reported that the proportion of AD was consistently higher than that of VaD (38, 39). This difference between Korea and Japan need more explanation but no definite cross cultural studies have performed yet. But several report around the turn of the century are starting to dispute the predominance of VaD in Japan, suggesting possible methodological issues in surveys or change in epidemiological pattern (37). Older studies from Korean and Chinese population dating from 1980s also report higher prevalence of VaD over AD, but both countries are reporting higher prevalence of AD in recent years. So there is a suggestion that transition from high incidence-high mortality society to low incidence-low mortality society may explain these findings (40).

For other types of degenerative dementia in the Korean elderly, prevalence estimates reported in the literatures have been limited. One study reported the prevalence for dementia with Lewy bodies as 0.4% (17) which was comparable to that of other countries (41). However, in a 2008 national-wide study of the prevalence of dementia, the prevalence of 'Lewy body dementia or Parkinson's dementia' was reported to be 0.12% (19). This study also reported the prevalence of frontotemporal dementia as 0.03% and that of alcohol-induced dementia 0.07%.

Risk factors for alzheimer's dementia

Old age is one of the confirmed risk factors for AD (42) and nearly every study carried out in Korea has reported an increased risk

of AD with advanced age (Table 3). Further, women are known to be affected by AD 1.5 times as often as men, even after adjusting for greater life span of females and shorter disease survival in males (43, 44). Most studies carried out in Korea also reported higher prevalence rates among females, and some of them listed female gender as a significant risk factor for AD (2, 3, 17, 19). Nevertheless, this could be the result of fewer opportunities for education and occupational attainment among women of older generations in Korea, due to traditional influences. As one would expect, a low level of education in itself was commonly reported risk factor of AD in epidemiological studies of Korea. Although the correlation between a low level of educational and the development of AD is still controversial, a number of studies performed in other developed countries also reported an increased risk for AD among less educated people (45, 46).

It was also widely speculated that the prevalence of dementia is higher in rural areas of Korea, because of rapid industrialization which resulted in younger people migrating toward big cities. However, this expected difference between urban and rural areas was not evident in studies carried out in Korea. Rural residence was not associated with an increased risk of dementia in a nationwide study, even when adjusted for age, sex, and education level (19).

Several studies reported a greater incidence of previous head trauma among patients with AD than normal controls (47, 48), which was replicated in one Korean study (19). There was also evidence from other countries suggesting that long term use of anti-inflammatory drugs including non-steroidal anti-inflammatory drugs (NSAIDs) and steroids, which are often used to treat diseases such as arthritis, lower the risk of AD (49, 50). This association between the treatment history of arthritis and a lowered risk was also replicated in a study involving an urban population in Korea (7).

Other miscellaneous risk factors reported in Korean studies were smoking (7), a history of carbon monoxide poisoning (8), higher scores in depression scales (18, 19), lower weight (18), and having no spouse (19). Further, regular exercise at moderate to high intensity and drinking less than 3 units of alcohol per day were suggested as protective factors for AD (19). More research will be needed to identify associations between the aforementioned risk factors and AD.

Risk factors for vascular dementia

Fewer studies are available regarding the risk factors of VaD as compared to those of AD. Following old age, hypertension has been considered the strongest risk factor (51, 52), a finding which was replicated in a Korean study (7). Some investigators have suggested other risk factors such as lower level of education, depression, smoking, past history of stroke, and being male, all of which were confirmed in studies carried out in Korea (3, 8, 13, 19).

Incidence of dementia

There have been only a few reports regarding the incidence of dementia in Korea; however, these recent studies are well designed, prospective studies with moderately large cohort sizes. One study involved a cohort from Yonchon County, a rural area in the vicinity of the demilitarized zone between North and South Korea. This cohort was established during a dementia prevalence survey in 1996. In this study, of the 968 elderly residents who had no dementia, 596 completed the second evaluation conducted three and one-half years later (9). The annual incidence rate for total dementia, AD, and VaD were respectively 18.8, 15.8 and 3.4 per 1,000 elderly populations.

Increasing age was significantly associated with the onset of dementia as a whole and also the onset of Alzheimer's disease. Additionally, there was a statistically significant difference in the three and one-half year mortality rates between those who were diagnosed as having dementia and those who were not.

Third follow-up of this cohort was performed in 2006, with 508 residents completing the interview (14). In this study, the annual incidence rate of dementia was 27.2 per 1,000 persons, which varied from 10.6 in the 65-69 yr old group to 88.9 in the over-85 yr group.

Another study that examined the incidence of dementia followed elders aged 65 yr and older over a 2.4-yr period (16). Association of subjective memory complaints and incidence of dementia were investigated as well. Of the 919 eligible participants at baseline, 686 completed all evaluations at follow-up, and the annual incidence rate of dementia was found to be 34 per 1,000 elders. Compared with those without subjective memory complaints (SMC) on either occasion, the incidence of dementia was higher in those with persistent SMCs (present on both occasions) and transient SMCs (present at baseline but not follow up). There was no association with new onset of SMCs during the follow-up.

These incidence rates need to be confirmed in future studies, but these annual incidence estimates means that, there will be at least 140,000 new cases each year. And this number is likely to double in just two decades.

EPIDEMIOLOGY OF DEPRESSION AMONG THE KOREAN ELDERLY

Prevalence of depression

Depressive disorders in old age are common, yet disabling dis-

Table 3. Risk factors of dementia in the Korean elderly

Author	Year	Risk factors		
		Dementia	AD	VaD
Park et al. (2)	1994	Aging, female sex	Aging, female sex	–
Woo et al. (3)*	1998	Aging, female sex (> 80 yr)	Aging, female sex	Aging, male sex
Cho et al. (4)†	1998	(Aging, lower education)	–	–
Kim et al. (5)	1999	Aging, female sex	–	–
Kwak et al. (6)‡	1999	Old age, lower education, cardiovascular disease history, Head trauma, smoking in female	–	–
Cho and Hong. (7)	2000	–	Aging, smoking *Protective factor: treatment history of arthritis.	Hypertension
Bae et al. (8)	2001	–	Aging, lower education, CO poisoning	Stroke history, lower education
Lee et al. (10)	2002	Aging, lower education	Aging, lower education	–
Shin et al. (11)	2002	Aging, female sex, lower education	Lower education	Aging, female sex
Kim et al. (12)*	2003	Aging Female sex, lower education	–	–
Suh et al. (13)	2003	Aging, lower education, smoking (> 30-PY)	Aging, lower education	Lower education, smoking (≥ 30 PY)
Shin et al. (15)	2005	Aging, lower education, no spouse, stroke history	–	–
Choi et al. (18)	2008	–	Aging, lower education, lower weight, higher GDS-K scores	–
Jhoo et al. (17)	2008	Aging, female sex	Aging, female sex	–
Cho et al. (19)	2009	Aging, female sex, low education, illiteracy, no spouse, Low economic status§, smoking, head trauma, Higher SGDS-K scores *Protective factors: exercise (moderate to hard intensity), drinking	Aging, female sex, low education, illiteracy, no spouse, low economic status, head trauma, higher SGDS-K scores *Protective factors: exercise (moderate to hard intensity), drinking less than 3 unit per day	Aging, lower education, illiteracy, no spouse, smoking, head trauma, current depression *Protective factors: exercise (moderate to hard intensity)

*Subgroups with or without specific risk factor were compared to each other for prevalence. Other statistical methods were not used; †Risk factors for cognitive impairment (MMSE-K ≤ 23) only were reported; ‡χ² method was used to show significant difference among AD, VaD and non-dementia groups for exposure to each risk factor. However, post-hoc analyses to identify specific relationships between each group were not performed; §Defined by recipients of public medical insurance for the destitute. AD, Alzheimer's disease; VaD, vascular dementia; CO, carbon monoxide; PY, pack-year; GDS-K, Korean version of the geriatric depression scale; SGDS-K, Korean version of geriatric depression scale short form.

eases. However, because depressive disorders are also quite manageable with modern pharmacological and psychotherapeutic approaches, geriatric depression has been one of the key areas of concern in terms of public mental health. There have been many studies worldwide attempting to determine accurate prevalence rates for geriatric depression and its effect on the burden of disease on society.

The Epidemiological catchment area (ECA) study in the USA reported lifetime and one year prevalence rates for major depressive disorders among a population aged 65 yr or more as 1.4% and 0.9%, respectively. This study was based on carefully sampled data from a large population; however, the prevalence estimates were one of the lowest as compared to other community studies relating to geriatric depressive disorder. Outside of the USA, prevalence estimates have generally been within the range of 4.8%-16.5% (53).

As indicated, prevalence estimates tend to vary, even in studies from within the same country or general area. One reason for this may be the diagnostic threshold of depressive disorder. As will be discussed regarding studies done in Korea, the prevalence of depressive symptoms is much higher than the prevalence of major depressive disorder or dysthymic disorder. In Korea, around 15%, and sometimes as high as 33% prevalence of depressive symptoms has been reported in community studies (54). In contrast, the prevalence of depressive disorders (e.g. major depressive disorder or dysthymia diagnosed according to DSM-III or DSM-IV) has been generally laid below 10%. This discrepancy can also be seen in studies from other countries. In general, demographic and sociocultural characteristics of a population greatly affect the prevalence of depression in that community. According to one analysis from a USA ECA study (55), the prevalence of the geriatric depression in the community was 15%, in contrast to 20% of geriatric outpatients and 40% of inpatients.

As expected from this, geriatric epidemiology studies for de-

pression in Korea have shown varied estimates of prevalence. Table 4 summarizes the various prevalence studies from the late 1980s. Prior to 1990, there were few studies regarding community populations; however, in the last two decades, several well-designed studies concerning depression have been conducted in community settings. Still, the bulk of literature dealt only with depressive symptoms, not the diagnosis of depressive disorders, let alone application of structured interviews.

One of the earliest community studies reported a 7% prevalence of depressive symptoms from a relatively isolated rural county of Kanghwa, an island community located near Inchon (56). However, another study conducted in Chonnam province suggested the rate of clinically significant depressive symptoms in rural populations was as high as 21%. With regard to urban areas, a study of a small neighborhood in Seoul reported that around 18% of the population had depressive symptoms (4) diagnosed using the Korean version of Center for epidemiologic study, depression (CES-D) (57). There have also been higher estimates for the prevalence of depressive symptom both in rural and urban areas of Korea (58), suggesting the need for further research.

Since these early studies, a series of studies using formal diagnostic criteria, such as the DSM-IIIR or DSM-IV, have been conducted. In 1999, a survey reported a 7.5% prevalence of major depressive disorder and 2.02% of dysthymia in Yonchon County. This study used the depression scale from PAS (Psychiatric Assessment Scale) to mass-screen the population, and subjects with potential depressive symptoms were subsequently interviewed by psychiatrists. Another study utilizing the same approach, reported a similar prevalence of major depressive disorders and dysthymic disorder at 7.3% and 3%, respectively, from the industrial city of Ulsan, located in southeast Korea (59). Around the same time, another study conducted in Inchon, a metropolitan area just west of Seoul, reported the prevalence of elderly major depression as 4.2% and dysthymia as 3.9% (8).

Table 4. The prevalence of depression in the Korea elderly

Author	Year	Area (N)	Diagnostic criteria or tools	Depressive symptoms (%)	Major depressive disorder (%)	Dysthymia (%)	Type of area
Lee & shin (77)	1989	Kangwha	–	9.1	–	–	Rural area
Rhee & Jung (56)	1993	Koksung (558)	SDS	20.9 (n = 117)	–	–	Rural area
Cho et al. (4)	1998	Seoul (447)	CES-D S-GDS-K	18.1 15.8	–	–	Urban area
Lee et al. (78)	1999	Seoul (490)	DSM-IV	–	9.4 (n = 46)	–	Urban area
Suh et al. (53)	1999	Yonchon (1,037)	DSM-III-R	–	7.5	2.02	Rural area
Hong et al. (59)	2000	Ulsan (723)	DSM-IV	–	7.3	3	Urban area
Bae et al. (8)	2001	Inchon (853)	K-CIDI, DSM-IV	–	4.2	3.9	Urban area
Kim et al. (61)	2002	Kwangju (1,134)	K-GDS	33 (n = 375)	–	–	Rural & urban
Kim et al. (60)	2004	Kwangju (1,204)	GMS-AGECAT	–	13.3 (n = 160)	–	Rural & urban
Lee et al. (79)	2005	Anyang (1,298)	GDS-15	15.2	–	–	Urban area
Lee & Hong (62)	2005	Jeju (590)	S-GDS-K	16.6 (n = 86)	–	–	Rural area

SDS, self rating depression scale of Zung; CES-D, Center for epidemiologic study-depression; S-GDS-K, Korean version of geratric depression scale, short form; GMS-AGECAT, geriatric mental state schedule-automated geriatric examination for computer assisted taxonomy algorithm; K-GDS, Korean version of geriatric depression scale; K-CIDI, Korean version of the composite international diagnostic interview.

This study is possibly the first study in Korea on elderly depression which included the use of a standardized structured interview for all subjects. In this study, the Korean version of Composite International Diagnostic Interview (K-CIDI) was used. The K-CIDI is a fully structured interview applied by a trained lay interviewer. As such, differences with respect to diagnostic thresholds may account for different prevalence rates between these studies. One study from Kwangju reported the prevalence of major depressive disorder as 13.3%, using the Geriatric Mental State Schedule-Automated Geriatric examination for Computer Assisted Taxonomy algorithm (GMS-AGECAT) (60).

In summary, as of the year 2010, up to a million elders across the nation are suffering from significant depressive symptoms and 300,000 of these might be diagnosed as having a major depressive disorder. With expected tripling of the elderly population in next 40 yr, the number of the elderly population who can diagnosed with a major depression would reach beyond a million, and those with depressive symptoms four millions.

Risk factors for depression

Several statistically significant risk factors for depressive disorders have been identified from cited prevalence studies. One study concluded that being in late seventies, (odds ratio [OR] = 2.87), having a past history of cerebrovascular accidents (OR = 3.33), or having a family history of depressive disorder (OR = 7.16) were significant risk factors for depression (53). Being female or having histories of hypertension or cerebrovascular accidents, and having a family history of depression (8, 59) were also listed as risk factors in other community studies. Yet another study, which compared urban and rural populations, suggested that increased age, a low level of education, engaging in a manual occupation, and currently renting were independently associated with depression in urban area, while a low level of education was associated with depression in the rural sample (61). In a study of rural Jeju islanders, economic status, having a chronic physical illness, and a person's perceived health status were found to be significant risk factors of depression (62). Additional studies on specific populations also reflect these factors. A sur-

vey of the institutionalized elderly reported that 23.5% showed significant depressive symptoms (63) and a recent study reported that among the low income elderly, the prevalence of depressive symptoms were as high as 69.8% (15).

Depression and cognitive disorders

Depression has been associated with many physical and mental illnesses. Cognitive disorders quite often co-present with depressive disorders. In fact, several studies on depression among the elderly examined cognitive impairment, as did at least two previously mentioned studies in Korean communities. One study reported that 35% of depressive patients exhibited cognitive deficits (53), while another study indicated that 45% of cognitively impaired patients had significant depressive symptoms (61).

Until now, epidemiological studies on elderly depression in Korea have been mainly concerned with cross-sectional prevalence and risk factors. There is a need for more solid data regarding the prognosis of geriatric depression. Geriatric depression may occur more frequently and may be more chronic with higher residual symptoms; however, there are little epidemiological data to verify these assumptions in Korea. Additionally, the relationship between cognitive disorder and depressive disorder must be addressed and thus, additional epidemiological studies in Korea are required.

EPIDEMIOLOGY OF ALCOHOL USE DISORDERS & SLEEP DISORDERS AMONG THE KOREAN ELDERLY

Alcohol use disorder

Table 5 summarizes prevalence studies of alcohol use disorders and sleep disorders among the Korean elderly. The lifetime prevalence of alcohol use disorders, according to the DSM-III criteria, was reported to be 21.2% in Kanghwa. Rates of alcohol dependence and alcohol abuse were reported to be 4.6% and 16.6% respectively (64), while twelve-month prevalence of alcohol use disorders was 13.6%, alcohol dependence was 3.5%, and alcohol abuse was 10.1% (65). In contrast, a survey using

Table 5. Prevalence of alcohal use disorders and sleep disorders among the Korean elderly

Alcohol use disorders	Namkoong et al. (63)	1987	Gangwha (n = 977)	Lifetime prevalence: 21.2% (n = 84) 12-month prevalence: 13.6% (n = 65)
	Bae and Cho et al. (7)	2001	Inchon (n = 853)	Lifetime prevalence: 13.43% (n = 94) 12-month prevalence: 4.37% (n = 30)
	Kim et al. (64)	2002	Gwangju (n = 1,134)	Alcoholism (NAST-I): 8% (n = 87)
	Kim et al. (67)	2009	Seongnam (n = 714)	Problem drinking (AUDIT): 11.34% (n = 81)
Sleep disorders	Hong and Cho et al. (57)	2000	Ulsan (n = 723)	Chronic Insomnia: 11.9% Intermittent insomnia: 14.8%
	Yang et al. (66)	1997	Busan (n = 201)	Insomnia: 57.7% (n = 116) Mild Insomnia: 23.9% (n = 48) Moderate Insomnia:19.4% (n = 39) Severe Insomnia: 14.4% (n = 29)
	Yoon et al. (67)	1999	Gwangju	Insomnia: 22%

NAST-I, Alcoholism Screeing Test Seoul National Mental Hospital-I; AUDIT, Alcohol Use Disorders Identification Test.

the structured interview K-CIDI, reported somewhat lower life-time and 12-month prevalence rates of DSM-IV alcohol use disorders. This study found lifetime prevalence of alcohol use disorders to be 13.4% (male 29.2%, female 3.1%), and twelve-month prevalence rates of 4.4% (male 9.2%, female 1.2%) (8). Further, lifetime prevalence of alcohol dependence and alcohol abuse as reported in this study, were 8.8% and 4.7%, and the 12-month prevalence of alcohol dependence and alcohol abuse were 3.38% and 0.54%, respectively. Another study, using a culturally validated screening method to identify alcoholism, showed that the rate of alcoholism was 8% (male 16%, female 2%) (66). Finally, a recent study surveyed 714 elders in Seongnam area with Alcohol Use Disorders Identification Test (AUDIT). In this study, prevalence estimates of problem drinking, including alcohol abuse, alcohol dependence and at-risk drinking was found to be 10.61% (male 24.36%, female 1.53%), whereas rate of social drinking was 13.60% (male 27.17%, female 4.63%) (67). Of these, prevalence of alcohol abuse and alcohol dependence was 2.28% and 2.92% respectively.

The significant risk factors of alcohol use disorders which have been identified include being male (OR = 3.05), having a family history of problem drinking (OR = 1.57), and smoking (OR = 2.45) (8, 67). Also there is a study reporting that alcoholism was positively associated with past manual occupation (66).

Drinking is believed to have an adverse impact on both physical and mental health of elders. Indeed. there was a report that alcoholism was associated with more cognitive impairment and dementia (66), but a recent study found that problem drinking was not associated with significant risk for cognitive impairment, transient ischemic attack, stroke or major depressive disorder. And social drinking was associated with decreased risk of stroke (OR = 0.27) and depression (OR = 0.49) (67). These conflicting findings may be explained by the known association of abstinence and poor health. Poor health should also be associated with depression, so poor health can be a confounding factor between alcohol problem and depression (67, 68). And there may be a difference between those who have depressive symptoms but not major depressive disorder and those who have major depressive disorder (67).

Generally speaking, the prevalence of alcohol use disorders in the elderly population is lower than the prevalence in younger adults, but still the alcohol use problem in old age is common and is possibly associated with higher frequency of both physical and mental comorbidity. So the problem of the elderly alcohol use warrants further clinical attention. But also there is a need for further studies to address the impact of alcohol use on various physical and mental conditions in the older adult population.

Sleep disorder

Sleep problems, let alone changes in sleep patterns are very com-mon among the elderly. These sleep disorders have great implications on their overall health and well-being (69). There have been several studies which examined insomnia in the elderly in Korea (Table 5), with a relatively wide range of prevalence rates (22% to 58%) (7, 70, 71) Two of these studies also surveyed the pattern of insomnia with one reporting that 52.4% of elderly subjects suffered from difficulty in initiating sleep, 50.5% from early morning wakening, and 45.1% from difficulty in maintaining sleep (71). Yet another reported that the rate of difficulty in initiating sleep was 27.7%, and the difficulty in maintaining sleep was 25.4% (7).

Yoon et al. (71) reported suggested that the factors contributing to insomnia were concern or anxiety (62%), pain or physical illness (42%), fatigue (10%), and nocturnal urination (5%). While some reports have indicated that not all sleep disorders were related to age (70), many have shown that indeed, the risk factor for insomnia was older age (7, 70). The contribution of gender also has been controversial. Being female was identified as a risk factor for insomnia in one study (34) but not in another study (7). As we can see, the magnitude of sleep problems and its associated factors in elderly is not entirely clear and may be controversial. But even the lower estimates of the prevalence of insomnia means that almost one-quarter of the elderly are suffering from insomnia. Thus, additional conclusive studies regarding the characteristics and risk factors of the Korean elderly with respect to insomnia need to be conducted.

SUMMARY

Depression that can be diagnosed as major depressive disorder may be only moderately frequent among the elderly; however, clinically meaningful depressive symptoms among the elderly have been shown to be highly prevalent in Korea. Despite the existence of this epidemic of depressive mood problems among the elderly, studies have been largely limited to cross-sectional investigations in selected communities. There have been two consecutive national-wide psychiatric epidemiology studies, each with more than 6,000 subjects, representative of the Korean adult population. But target population of both studies was the adult population under the age of 65 (72, 73). Also prospective studies are necessary and should provide an insight regarding the incidence and course of depressive disorder in the older adults, as well as perhaps establishing an association between geriatric depression and dementia.

With respect to dementia, and in particular, Alzheimer's disease, reliable epidemiological data is accumulating. As we have summarized in the current paper, a large cross-sectional study (19), which was meant to represent the entire national elderly population, was conducted recently and two moderately large, if not massive, prospective cohort studies also provided some insight regarding the incidence and course of dementia (9, 14,

16). Regardless, further prospective studies examining incidence rates and the natural course of dementia are needed especially given that there has been an overall lack of evidence from large urban cohorts with longer follow-up period. The urban population comprises 89.1% of entire Korean population, and metropolitan areas account for 48% of the national population (74). It has been speculated that large demographic and sociocultural differences exist between urban and rural area residents in Korea, although these factors were suggested to be of little importance in a recently published report (19).

Naturally, in addition to incidence rates from normal adult, the conversion risk from so-called mild cognitive disorder also needs to be addressed, so that we can determine the most effective point to maximize preventive intervention.

Elderly alcohol use problem is very prevalent, if not to the level of younger adult population. Even with some reported protective genetic composition, cultural permissiveness for drinking seems generating widespread of alcohol related problems in Korean elders (67, 75). But it seems that relationship between health burden and drinking is not linear, so there's need for more studies elaborating the impact of alcohol use on health of the elderly. Sleep problems are also very prevalent conditions among the elderly, but reported prevalence rates shows very wide variance between them. So there's a need for more research to determine the true magnitude of elderly sleep problems. This is important not only because sleep disorders cause deterioration of health and life quality, but also because there is a possible link between sedative-hypnotics misuse and insomnia (76).

As we expected, and saw from reviewed studies, geriatric psychiatric problems are already prevalent in Korean communities. Because the proportion of elderly population is most likely to continue increasing, the corresponding socio-economic burden of geriatric mental illness will also steadily grow, perhaps to a staggering degree. Therefore, it is imperative that we pay close attention and try to mitigate even a fraction of inevitable burden expected in near future.

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AUTHOR SUMMARY

Prevalence of Major Mental Disorders among the Korean Elderly

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With a rapidly aging society, geriatric mental health is emerging as important public health concern. In the current study, we reviewed epidemiological findings regarding geriatric mental health in Korea. It was found that up to 10% of the elderly suffer from dementia, and 10% to 20% from depressive disorder. Further, prevalence estimates of Alzheimer's disease ranged from 4.2% to 9.0%, and vascular dementia from 1.0% to 4.8%. Annual incidence rates of Alzheimer's were 2.7% to 3.4% whereas that of vascular dementia was found to be as low as 0.3%. The prevalence of major depressive disorder was 4.2% to 9.1%, while that of clinically significant depressive symptom were between 9.1% and 33.0%. Finally, those with alcohol use disorders were found to comprise up to 13.6% of elderly population and 22% to 58% of the elderly were found to have sleep difficulties.