

Analysis of Western–Korean cooperative treatment in hospital–care of patients with dementia[※]

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[Abstract]

Objectives : The purpose of this study is to provide data to guide dementia health–care policy in Korea and to establish the position of Korean medical specialists in long–term care hospitals by analyzing the data of dementia inpatients. We analyzed the actual condition of dementia patients in care hospital and the effect of Western–Korean cooperative medicine on the progress of dementia.

Methods : From January 1, 2016 to December 31, 2016, inpatients who were diagnosed with dementia at Mungyeong municipal long–term care hospital and admitted for more than 3 months were enrolled. Their medical records and simple tests were analyzed retrospectively.

Results : We examined the detailed diagnosis, including both main and sub diagnosis, and Alzheimer disease dementia, at 97%, was the most common. At the time of admission, Korean Version of the Mini–Mental State Exam (K–MMSE) analysis showed that severe dementia affected 52%, and most were rated as Geriatric Depression Scale (GDS) 6. Based on the admission date, the results of a simplified test applied to the dementia patients every 6 months showed an maintain in the K–MMSE and GDS scores in 83%.

Conclusion : The results of this study show that the rate of progression of dementia is somewhat lower in inpatients with moderate to severe Alzheimer's who have received Western–Korean cooperative treatment. However, due to institutional limitations, long–term inpatients such as those with dementia do not receive active traditional Korean medical treatment; hence, it is necessary to improve the national institution of traditional Korean medicine in long–term care hospitals.

Key words :

Care hospital;
Korean medical treatment;
Dementia;
MMSE;
GDS

Received : 2017. 07. 10.
Revised : 2017. 07. 21.
Accepted : 2017. 07. 28.
On–line : 2017. 08. 20.

※ This research was supported by a grant from Daegu Haany University Ky–lin Foundation in 2016.

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I. Introduction

The number of people over 65 years old in Korea was 6.57 million as of 2015, accounting for 13.2% of the total population¹⁾. It is predicted that the proportion of the elderly population will rapidly increase to 20.8% in 2026 due to an aging society²⁾.

As the proportion of the elderly population increases, the number of care hospitals, which were 78,461 in 2008, increased to 88,163 in 2015, an average 1.7% increase per year. As a result, the number of healthcare workers in care hospitals in 2015 also increased by 4.7% over the previous year³⁾.

As the elderly population increases, the number of care hospitals will also increase, and there are many studies on the quality of life of patients in care hospitals, such as studies about the meaning and nature of the change of life of elderly patients admitted to a care hospital²⁾, and patient satisfaction or reuse according to the motivation for choosing care hospital treatment⁴⁾.

Dementia refers to a complex clinical syndrome in which a mature brain is abnormally damaged or destroyed by diseases, not trauma, such that mature cognitive functions and mental functions of intelligence, learning, and language generally decline⁵⁾. Questionnaires have been previously used to explore the Western-Korean cooperative treatment of dementia in specialist and clinical studies^{6,7)}.

Although the care hospitals in Korea have Western-Korean cooperative treatments for dementia and these are the only medical institutions that provide cognitive programs through social workers, there is a lack of multidisciplinary studies and data about Western-Korean cooperative treatments on geriatric mental illness patients who have been hospitalized at care hospital. Therefore, it is difficult to provide a basis for the effectiveness of the decision on the policy about the Korean medical institution in the care hospitals and the medical specialist of the traditional Korean medicine is not applied in the care hospitals.

The purpose of this study is to provide data to

guide dementia health policy in Korea and to establish the position of traditional Korean medical specialists within care hospitals through analyzing dementia patients admitted to the Mungyeong municipal care hospital by seriousness, diagnosis, application of Western-Korean cooperative medicine, and the progression of dementia. We analyzed the actual condition of dementia patients in care hospitals and the effect of Western-Korean cooperative medicine on the progression of dementia.

II. Methods

1. Research subjects and period

From January 1, 2016 to December 31, 2016, patients who were diagnosed with dementia and who were hospitalized at Mungyeong municipal care hospital for more than 3 months were enrolled.

1) Patient selection

During the above period, patients who had been diagnosed with dementia and were hospitalized for more than 3 months were enrolled in this study. Traditional Korean medicine treatments were administered to the dementia inpatients according to the request of the conservator or the patient. However, re-admission of the same patient was calculated as 1 patient even if it was after more than 3 months.

2) Disease

The main diagnosis at the time of hospital admission was used. During traditional Korean medical consultation, the disease described as the main diagnosis by the traditional Korean medical doctor was regarded as the treatment target disease.

2. Research methods

1) Inpatient distribution and analysis

The general characteristics of the dementia in-

patients in the care hospitals were analyzed by sex, age, and length of stay.

2) Analysis of patients with a diagnosis of dementia according to the classification system

During the study, we examined the number and proportion of detailed diagnosis name requested by the dementia, including both the main and sub diagnosis. In addition, the system that classifies the patient groups in the care hospital is divided into seven groups: ultra–high medical care, high medical care, medium medical care, behavioral problem, impaired cognition, mild medical care, and reduced physical function⁸. In this classification system, we examined the number and proportion of patients diagnosed with dementia admitted during the period by taxa.

3) Simplified test analysis of patients diagnosed with dementia

Simplified tests for dementia include the Mini–Mental State Exam (MMSE), Geriatric Depression Scale (GDS), and Activity of Daily Living (ADL). The MMSE is recommended as a common dementia screening test in many clinical guidelines, and the GDS was developed to evaluate the seriousness of degenerative dementia. In this hospital, the social workers evaluated patients with the K–MMSE standardized in Korea and the GDS, on admission day and after 6 months.

4) Analysis of inpatient disease treated with traditional Korean medicine

(1) Frequency of traditional Korean medicine

We examined the data on Korean medical treatment and the number of insurance claims for dementia inpatients who received traditional Korean medical treatment according to the request of the conservator or the patient.

(2) Analysis of herbal medicine treatment

We investigated the number of herbal medicine treatments given to inpatients who were treated

with Western–Korean cooperative treatment. The items were classified into a paper of medicine and insurance claims for herbal extracts.

5) Analysis of dementia inpatient treated with western medication

We analyzed the number of patients and proportion of prescriptions according to the medications prescribed for the dementia inpatients.

III. Results

1) Inpatient distribution and analysis

The sex distribution showed that there were more women, 113 (76%) female and 36 (24%) male. Approximately half of the patients were in their 80s (74 people, 50%), followed by patients in the 90s (23%), 70s (19%), and 60s (5%). The majority of patients were hospitalized for 1 to 3 years (76 people, 51%) (Table 1).

2) Analysis of patients with a diagnosis of dementia according to the classification system

We examined the detailed diagnosis claimed by the dementia, including both the main and sub diagnosis. Alzheimer disease dementia was the most common at 97% (Table 2). In the distribution of the diagnosis of dementia, the impaired cognition group accounted for the largest proportion (48%), followed by the medium medical care group 26%, the high medical care group 19%, the reduced physical function group 4%, and the behavioral problem group 3% (Table 3).

3) Simplified test analysis of patients diagnosed with dementia

(1) Simplified test analysis of patients diagnosed with dementia at the time of admission

At the time of admission, K–MMSE analysis showed severe dementia at 52%, moderate dementia

Table 1. Inpatient Distribution based on Sex, Age, and Period of Hospitalization

Classify		Actual inpatients	Proportion (%)
Total		149	100%
Sex	Men	36	24%
	Women	113	76%
Age	40s	1	1%
	50s	2	1%
	60s	7	5%
	70s	29	19%
	80s	74	50%
	90s	34	23%
The period of hospitalization	100s	2	1%
	Less than 1 year	37	25%
	1 to 3 years	76	51%
	More than 3 years	36	24%

Table 2. Number and Proportion of Dementia Patients based on Diagnosis

Disease code	Diagnosis	Number	Proportion (%)
F009	Dementia in Alzheimer's disease, unspecified	1,716	97%
F023	Dementia in Parkinson's disease	17	1%
F03	Senile dementia NOS	20	1%
F019	Vascular dementia, unspecified	17	1%

Table 3. Number and Proportion of Dementia Patients as Classified Groups

Classified group	Inpatient number	Proportion (%)
Ultra-high medical care group	0	0%
High medical care group	29	19%
Medium medical care group	38	26%
Behavioral problem group	5	3%
Impaired cognition group	71	48%
Mild medical care group	0	0%
Reduced physical function group	6	4%
Total	149	100%

Table 4. Number and Proportion of Dementia Patients based on K-MMSE Score

Classify	K-MMSE* score	Inpatient number	Proportion (%)
Normal	24-30	17	1%
Mild dementia	20-23	52	3%
Moderate dementia	10-19	760	44%
Severe dementia	0-9	899	52%
Total		1,728	100%

*K-MMSE means Korean mini mental state examination.

44%, mild dementia 3%, and normal 1% (Table 4).

At the time of admission, patients scored at GDS 6 showed the highest rate (27%), GDS 5 at 26%, and GDS 2 and GDS 3 were both at 16% (Table 5).

In ADL analysis, 9-15 points was the most common (52%), 16-20 points for 39%, and 4-8 points for 9% (Table 6).

(2) The score change of patients diagnosed with dementia

On the basis of the admission date, the results of the simplified test of the dementia patients every 6 months showed the changes in K-MMSE and GDS were improvement 1%, maintenance 83%, and aggravation 16% (Table 7).

Table 5. Number and Proportion of Dementia Patients based on GDS

GDS* grade	Inpatient number	Proportion (%)
GDS1	0	0%
GDS2	17	1%
GDS3	276	16%
GDS4	276	16%
GDS5	449	26%
GDS6	468	27%
GDS7	242	14%
Total	1,728	100%

*GDS means Global Deterioration Scale.

Table 6. Number and Proportion of Dementia Patients based on ADL

ADL*	Inpatient number	Proportion
4–8	155	9%
9–15	899	52%
16–20	674	39%
Total	1,728	100%

*ADL means activities of daily living.

4) Analysis of inpatient disease treated with traditional Korean medicine

(1) Frequency of traditional Korean medicine

The main diagnosis given for patients who were treated with traditional Korean medicine were arranged in frequency order. Other spinal diseases accounted for most of the items, followed by sequelae of cerebrovascular disease, arthropathy, hemiplegia, knee arthropathy, and fracture (Table 8).

Table 8. Rank and Number of Dementia Patients by Diagnosis

Rank	Diagnosis	Disease code	Number
1	Other spondylosis	M47	370
2	Sequelae of cerebrovascular disease	I69	245
3	Arthritis	M13	229
4	Hemiplegia	G81	152
5	Gonarthrosis	M17	119
6	Fracture	S32–S71	99
7	Cancer	C	60
8	Parkinsons	G20	42
9	Migraine	G43	34
10	Bell's palsy, dementia	G, F	24

Table 9. Number of Insurance Claims and Number of Dementia Patients based on the Treatment Method

Korean medical treatment	Inpatient number	Number of insurance claims	Treatment details
Acupuncture	140	20,597	Number of acupuncture sessions
Insurance herbal extract	21	687	Number of prescriptions
Herbal medicine	12	390	Number of papers
Total	173	21,674	

Acupuncture (20,597) was the most commonly used traditional Korean medicine treatment, followed by insurance herbal extract and herbal medicine (Table 9).

Table 7. Number and Proportion of Patients based on the change in K–MMSE and GDS Score over One Year

The score change of K–MMSE*/GDS†	Improvement	Maintenance	Aggravation
Inpatient number	17	1434	277
Proportion	1%	83%	16%

*K–MMSE means Korean mini mental state examination.

†GDS means Global Deterioration Scale.

(2) Analysis of herbal medicine treatment

In the analysis of the number of prescriptions of insurance herbal extracts, Samhojackyak-tang accounted for most of the items, followed by Bunsimgieum, Ojeoksan, Bojoong-Ikgi-tang, and Jaeumkanghwa-tang (Table 10). In the analysis of

Table 10. Number of Insurance Claims for Herbal Extracts

Extract	Number
Samhojackyak-tang: insurance	181
Bunsimgieum	156
Ojeoksan: insurance	99
Bojoong-Ikgi-tang: insurance	51
Jaeumkanghwa-tang: insurance	60
Naesosan: insurance	30
Daehwajoongeum: insurance	30
Hyangsapyeongwi-san: insurance	21
Kamisoyo-san: insurance	21
Banhasasintang: insurance	15
Ssangpae-tang	13
Hyeonggaeyeongyo-tang: insurance	9
Sohabhwang-won	3
Uhwangchungsim-hwan	1
Total	687

Table 11. Number of Insurance Claims by Papers of Herbal Medicine

Herbal medicine	Paper
Yupungyangyoung-tang	130
Soyangbang(senile)	60
Kamibokryeong-tang	40
Palmijihwang-hwan	20
Banhahoobak-tang	20
Bokryeong-tang	20
Gwi-bi-on-dam-tang	20
Kamiguizhi-tang	20
Kamijakyak-tang	20
Jeungsonwhalwheul-tang	20
Danguigunjung-tang	20
Total	390

the number of prescriptions of herbal medicine, Yupungyangyoung-tang accounted for most of the items, followed by Soyangbang (senile), Kamibokryeong-tang, Palmijihwang-hwan, and Banhahoobak-tang (Table 11).

5) Analysis of dementia inpatients treated with western medication

According to the proportion of prescriptions written for dementia inpatients, donepezil-based medications that were applied under MMSE 26 and GDS 3-7 accounted for the largest proportion (84%), followed by galantamine 10%, rivastigmine 4%, and memantine 1% (Table 12).

IV. Discussion

In order to protect the health of the elderly, the numbers of whom are rapidly increasing with population aging, countries around the world are developing and operating medical services and insurance systems specialized for the elderly⁹⁾. In Korea, too, due to the aging society, the number of care hospitals equipped with professional services and facilities is increasing due to the increases in geriatric diseases and the increases in medical expenses for the elderly.

Patients who are usually hospitalized in care hospitals are those with chronic geriatric diseases, cerebrovascular diseases, and dementia, and also for some elderly, long-term care services are needed because of a decreased ability to perform daily activities of living¹⁰⁾.

Dementia is defined as a disorder of daily and social life due to decreases in various cognitive functions such as memory, language, concentration, performance, and orientation in time and space caused by acquired brain dysfunction. Dementia is not the disease but a syndrome caused by structural damage to the brain or lack of neurotransmitters as a result of various diseases¹¹⁾.

Table 12. Number and Proportion of Dementia Patients Treated with Western Medication

Medication name (Manufacturing importer)	Ingredients	Patient number	Proportion of prescriptions	Insurance application standard
Hipezil tablet 10 mg (Hyundaipharm)	donepezil HCl 10 mg	449	26%	K–MMSE [†] 26 or less, GDS [‡] 3–7
Hipezil tablet 5 mg (Hyundaipharm)	donepezil HCl 5 mg	1002	58%	
Stagmin patch 10 mg (Hyundaipharm)	rivastigmine 18 mg	69	4%	
Tamirin ER* tablet 8 mg	galantamine HBr 10.25 mg	51	3%	K–MMSE [†] 10–26 GDS [‡] 3–5
Tamirin ER* tablet 16 mg	galantamine HBr 20.51 mg	51	3%	
Tamirin ER* tablet 24 mg	galantamine HBr 30.76 mg	69	4%	
Dimantine tablet 10 mg	memantine HCl 10 mg	17	1%	K–MMSE [†] 20 or less, GDS [‡] 4–7

*ER : extended release.

†K–MMSE means Korean mini mental state examination.

‡GDS means Global Deterioration Scale.

Research on patients with dementia admitted to a care hospital applying western medicine includes a study by Joo et al.¹²⁾, who analyzed a model of internal and external spaces and a medical facility in a care hospital for dementia patients; a study by Bang et al.¹³⁾ that analyzed the factors affecting the number of admission days for Alzheimer patients; and a study by Kang et al.²⁾ that analyzed the changes in the lives of elderly patients in a domestic care hospital, which provides a mixed function of care hospital and geriatric care facilities. In addition, recently, there has been a lot of research about the treatment and quality of life of dementia patients admitted to a care hospital.

According to the current study, dementia patients with Alzheimer disease accounted for 97% of patients admitted to the hospital with dementia. The reason for this is that the primary cause of dementia is degenerative disease and the ages of admission to the hospital were 50% in their 80s, 23% in their 90s, and 19% in their 70s.

According to Lee et al.⁸⁾'s study, the distribution of patients admitted for more than a year to 35 care hospitals between 2008 and 2010 showed a higher proportion of the ultra–high medical care group, high medical care group, and medium med-

ical care group. In contrast, in this study, the impaired cognition group, median, and high medical care group comprised 48%, 26%, and 19%, respectively. This difference seems to be due to being targeted to dementia patients among whom cognitive function and behavioral psychological symptoms mainly occur. In addition, the proportion in the impaired cognition group appears to be high because dementia mainly occurs in memory, locomotion, language disorders, and time and space dysfunction.

The MMSE was developed by Folstein et al. in 1975 and is designed to measure various cognitive functions in 5 to 15 minutes. In Korea, there are the MMSE–K and K–MMSE. The K–MMSE used in this study is useful for evaluating and detecting cognitive impairment in Alzheimer dementia patients and vascular dementia patients as shown in Kang et al.¹⁴⁾

It is also possible to observe changes in cognitive function through repeated measures. The GDS is an overall degenerative scoring system that can be used to evaluate the degree of cognitive impairment during aging and dementia, and it can show changes in the patient's level of function over time¹⁵⁾.

In this study, on the K-MMSE, 52% had 0-9 scores, 44% 10-19 scores, and 4% 20-30 scores. For the GDS, it was 27% had GDS6, 26% had GDS5, and GDS3 and GDS4 were both at 16%. The percentage with severe and moderate dementia, which is at a stage that is no longer capable of thinking or reasoning, was high at 53% with GDS 5 and 6, which is moderate dementia with diminished memory and poor judgment, and 14% at GDS7, which is severe dementia. This suggests that moderate dementia predominated in this study.

As a result of comparing the changes of K-MMSE and GDS every 6 months for dementia inpatients, 83% of the patients were maintained, 16% of the patients were getting worse, and 1% were getting better. Therefore, overall the degree of progression of symptoms was not large¹⁶.

When considering the fact that 39% of patients with Alzheimer disease will have to use a care hospital within a year after diagnosis due to symptomatic deterioration, the rate of progression of dementia was somewhat lower in inpatients in this study with moderate to severe Alzheimer disease who received Western-Korean cooperative treatment.

The most common diseases treated by Korean medical consultants at this hospital were 370 cases of other spinal diseases, followed by 245 cases of cerebrovascular disease, 229 cases of arthropathy, 152 cases of hemiplegia, and 119 cases of knee arthropathy.

Although there is no established acupuncture treatment for dementia, patients who have been hospitalized for long periods with dementia generally prefer the traditional Korean medicine treatment for paralysis and musculoskeletal diseases. In addition, the number of patients treated by extracts or herbal medicine was rather small, although they are widely used as a prescription related to diseases such as pain, digestive diseases, and cold damage. This suggests that, in the case of Korean herbal insurance extracts, these are not allowed to be prescribed within the same diagnosis, so that a simple prescription cannot be written for

dementia.

Currently, the insurance fee for acupuncture in long-term inpatient care hospitals is estimated to be calculated every day for the first 3 months. Long-term inpatients for more than 6 months, such as patients with dementia admitted to the hospital, are allowed traditional Korean medicine treatment only twice a week, so it is difficult to actively treat them with traditional Korean medicine¹⁷.

Western medicine is applied to diagnosis-related-groups payment, and a certain amount of the insurance fee is calculated for long-term patients hospitalized over 4 months. Thus, in traditional Korean medicine, due to these factors, inpatients who have a longer stay are treated with a lower frequency and quality of medical services. As a result, the role that Korean medical specialists play is limited by the institutional limit compared to western medical specialists, and the position of the Korean medical specialist in care hospital is bound to become narrow. Eventually, inpatients who are admitted for long periods to care hospitals are not able to receive Korean medical treatment.

This study examined the distribution according to the classification system of dementia patients at care hospital, the distribution of dementia patients by severity according to the simplified test, the progression of their dementia over a year, and the traditional Korean treatment of dementia patients.

In an aging society, geriatric mental illness is a major part of health care, and the percentage of geriatric patients with dementia in care hospitals is rising. In addition, since the medical expenses of dementia patients are rising year by year, the medical expenses burden has increased, and cost-effective patient care is needed.

However, this study is limited to one hospital that was surveyed and it is difficult to generalize its findings to other hospitals. However, in the current study, it can be meaningful that there is no analysis of the progress of dementia inpatients in a care hospital for one year. In addition, this study shows the institutional problems that may occur in

Western–Korean cooperative treatment of inpatients with dementia in care hospitals. Based on this, it seems that institutional systems should be reorganized, so that the Korean medical specialists should be able to provide more active traditional Korean medicine to long–term hospitalized patients such as geriatric dementia patients.

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