Activities of Daily Living in Different Types of Dementia patients in Southern Taiwan

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Abstract

This study investigated the functional status of ADLs in different types of dementia, by using PADL (Physical Activities of Daily Living) and IADL (Instrumental Activities of Daily Living)measures, and to understand the degree of dependency and the needs for assistance in performing activities of daily living. The subjects comprised 64 Alzheimer's disease(AD), 21 vascular dementia (VaD), 8 Mixed AD and VaD, and other disorders who were recruited from two epidermiologic studies of dementia with a total of 3,931 community residents aged 65 years and above in southern Taiwan. The measures included rates of dementia types, using Chinese Mini Mental Status Examination(CMMSE), Blessed Dementia Rating Scale(BDRS), CERAD(the Consortium to Establish a Registry of Alzheimer's Disease), Hachinski Ischemia scale, ICD-10NA,DSM-Ⅲ-R criteria for dementia, NINCDS-ADRDA guidelines for Alzheimer's disease(AD) and NINDS-AIREN criteria for vascular dementia (VaD), Clinical Dementia Rating (CDR) for dementia severity, PADLs and IADLs for assessing functional status. The results showed that 67.2% of all AD patients were female, and 61.9% of all VaD patients were male. For the AD patients, walking and grooming were the most difficut items on PADLs, whereas preparing meals, handling money, and doing housework were the most difficult items on IADLs. For VaD patients, as grooming and bathing were the most difficult PADLs items, whereas preparing meals and doing housework and going shopping were the most difficult IADLs items. VaD patients showed poorer responses, and were more dependent than AD patients on all

PADLs and IADLs functional items. The PADLs and IADLs functional status scores were significantly associated with the types of dementia (P＜.05) and with the CDR of dementia patients (P＜.001).

In conclusion, most dementia patients are dependent in daily activities, different types and severity of dementia lead to different disability profiles; individualized care is, therefore, most appropriate.

Key words: Alzheimer's disease, vascular dementia, Physical Activities of Daily Living, Instrumental Activities of Daily Living

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南台灣社區失智症老人日常生活功能之表現

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摘要

　　本研究之目的係以日常活動能力量表來評估不同類別失智老人在執行各項身體性及工具性日常活動之依賴程度及應協助事項。本研究以 64 位阿茲海默氏症、21 位血管性失智症、8 位混合型失智症及其他類型失智症，係由多段隨機抽樣取自高高屏 3931 位 65 歲以上社區老人。診斷採 CMMSE、失智評分量表、神經心理測驗、腦缺血失智評估、國際疾病分類、精神疾病統計資料手冊、AD 及 VaD 診斷標準等。研究結果顯示：AD 患者在 PADLs 以自行走路、盥洗為最困難，IADLs 以準備三餐、處理金錢及家務最困難。VaD 患者以盥洗及洗澡、準備三餐、處理家務及上街購物為最困難。研究結果也顯示 PADLs 及 IADLs 與失智症之類別相關（P＜0.05），且與失智症嚴重度有明顯負相關（P＜0.001）。多數患者在 PADLs 及 IADLs 表現不一，應給予個別化之協助。

關鍵詞：阿茲海默氏症（AD）血管性失智症（VaD）
　　　　身體性日常活動（PADLs）工具性日常活動（IADLs）

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1、Introduction

Dementia is a syndrome of progressive decline the relentlessly erodes intellectual abilitites, causing congnitive and functional deterioration, which leads to impairment of social and occupational functioning (Desai, Grossberg and Sheth. 2004). The deficit is multifaceted and involves memory, judgment and abstract thought. Behavioral and pessonality changes also occur in an alert person (Burke Laramie 2000).

Most peole with dementia are able to live at home in the community for a substantial part of their lives. Functional disability is a defining feature of all dementias. In dementia, functional impairment is associated with two major types of abilities：pysical activities of daily living (PADL) and instrumental activities of daily living (IADL). Functional status is measured by direct observation of the older person's ability to complete basic self care tasks in his environment (Armer, Conn, Decker and Tripp-Raimer 2001).

Lawton's physical and instrumental activity of daily living scales (PADL and IADL) can be used to determine the level of functional status and the levels of assistance required by the demented elderly (Lawton MP. 1971). The reliability and validity of the PADL and IADL scales are considered sufficient to warrant their use in clinical assessment, program evaluation, and health planning (Katz SK. 1983), PADL could be a better predictor of dementia than cognitive impairment when diagnosing dementia. (Van Hout , Vernooij-Dassen , Hoefnagels, et al., 2002; De Lepeleire , Aertgeerts, Umbach et al., 2004)

A population based study on functional performance of Alzheimer's disease (AD) and vascular dementia (VaD) was investigated by the Functional Independence Measure (F1M). (Shiau, Yu, Yuan, Lu. 2006). The results showed that self-care was the most difficult subscale on the motor dimension, especially, bathing, upper and lower dressing items, and memory was the most difficult item on the cognitive dimension for the demented elerly. For the AD patients, stairs climbing, bathing and tub or shower transfer were the most difficult items on motor dimension and memory was the most difficult item on cognitive dimension. For VaD patients, upper and lower dressing, bathing and grooming were the most difficult items and problem

solving was the most difficult item on cognitive dimension. Although the severity of dementia (CDR) was similar between two groups, VaD showed more dependent on all the F1M items. This analysis showed that the best item for distinguishing between the AD and VaD group were bed/chair transfer, upper dressing, problem solving, expression, lower dressing and bathing. In conclusion, most dementia patients are dependent in daily activities and different types and severity of dementia lead to different disability profiles; individualized care is, therefore, most appropriate.

However, no population-based study has explored the differences in PADL and IADL among different types of dementia. The purpose of this study was to investigate the functional status of different types, and different degrees of severity of elderly dementia patients by assessing the PADL and IADL, and to understand the degree of dependeney and the need for assistance in performing activities of daily living.

2、Method

Subjects and design

All of the subjects were collected from the two major dementia epidemiological studies in Taiwan. (Liu CK, Lin RT, Chen YF et al.,1996；Liu CK, Lai CL, Tai CT et al., 1998). A total of 3,931 examined elderly subjects, aged 65 and over, were collected by a multi-step stratified random sampling method. The ascertainment of dementia cases was done by using a two-phase study design. In the screening phase(phase 1), a culturally adapted version of the Chinese Mini Mental Status Examination (Chen YF. 1994), Blessed Dementia Rating Scale(BDRS) (Blessed, Tomlinson, Roth, 1968) and a questionnaire regarding detailed demographic data and past medical history were administered by specially trained interviewers. In phase 2, the CERAD (the Consortium to Establish a Registry of Alzhemer's Disease) neuropsychological test battery (Morris, Heyman, Mohs, et al,1989) was performed by neuropsychologists, and comprehensive neurobehavioral examinations, including Clinical Dementia Rating Scale(CDR) (Hughes , Berg , Danziger, et al., 1982) and Hachinski Ischemia Scale, (Hachinski , Hiff , Zilhka, et al., 1975) were administered by senior neurologists. The ICD-10NA, DSM-Ⅲ-R criteria for dementia,

NINCDS-ADRDA guidelines for Alzheimer's disease(AD) (McKhann , Drachman , Folstein et al., 1994) and NINDS-AIREN criteria (Roman , Tatemichi , Erkinjuntti et al., 1993) for vascular dementia(VaD) were employed to identify the subtypes of dementia.Severity of dementia was classified by the CDR, and CDR=1, 2, 3-5 represented mild, moderate,and severe, respectively. From the two studies, the total number of the demented elderly was 153. Of these 153 demented elderly, 30 died, 7 moved, and 14 could not be traced. Consequently the remaining 102 subjects were enrolled. Of these 102 demented patients, 64 (62.7%) were classified as having AD, 21 (20.6%) as having VaD, eight (7.8%) as having mixture of AD and VaD, two (2.0%) as having Parkison's disease, and seven(6.9%) as having other disorders, including two normal-pressure hydrocephalus, three multiple causes, one traumatic, and one hypothyroidism.

Functional assessment

ADL scales (Fillenbaum , Delliger , Maddoxg. Pfieffe 1987；Hsiao , Chiu , Liu , 1994；Doble , Fisber , 1998) used in this study consists of 14 items covering 7 items of Instrumental Activities of Daily Living(IADL) and 7 items of Physical Activities of Daily Living(PADL). The ADL scale has adopted a 3-level scale of function, ranging from independence to complete dependence, for its measurement of each item. The higher score, the less dependence on a helper. The minimum and maximum scores of IADL and PADL that patients can obtain are 7 and 21, respectively. The reliability of IADL was 0.973 and the reliability of PADL was 0.968.

Procedures

The study subjects were contacted by telephone to determine their interests in participating in the study and to set up an interview. Those who had no telephones were contacted by mail. During the home visit, a specially trained researcher evaluated the patient's performance on the PADLs and IADLs by observation and face-to face interviews with the patients and their caregivers. After assessment, health education was also conducted for caregivers to increase their knowledge about dementia, means of improving the safety of the environment, and care skills.

The home visit was conducted for each patient, with each home visit taking one to two hours.

Statistical Analyses

Descriptive and univariate categorical analysis were used to explore the demographic characteristics among different types of dementia. Multivariate linear regression analysis with adjusting for confounding sex variable were used to investigate the association between the functional status of patients and the types of dementia, and between the functional status of patients and the severity of elderly dementia. All tests for inference allowed a type I error rate of 5%. The inference was examined with the SAS/STAT computing program.

3、Results

Demographic characteristics of patients with dementia are shown in Table 1. This study consisted of 64(62.7%) AD patients, 21(20.6%) VaD patients, 8(7.8%) Mixed patients, and 9(8.9%) others. The number of female dementia patients was higher (57 patients, or 55.9%) than for male patients(45 patients, or 44.1%). It was also found that VaD patients were predominantly male(13 patients, or 61.9%). The proportion of dementia increased with age. The number of patients under 75 years old was 35(34.3%), and the number aged with 75 and over was 67(65.7%). There were significant differences in gender(x^2 =8.97,P < .05) and in age groups (x^2=20.72,P < .01). The incidence of dementia was higher in the illiterate group(67 patients, or 65.7%) than that in literate group(35 patients, or 34.3%). Regarding the severity of dementia, 19 subjects(18.7%) were rated in CDR3 and over. However, there were no significant differences in education and severity of dementia, i.e. stage of CDR, among the four groups.

Table 2 shows the degree of dependeney in different types of dementia, For the AD patients, walking and grooming were the most difficult items on PADLs, whereas preparing meals, handling money, and doing housework were the most difficult items on IADLs. For VaD patients, as grooming and bathing were the most difficult PADLs items, whereas preparing meals, doing housework and going shopping were the most difficult IADLs items.

In general, for these 102 demented elderly, Four leading difficult PADL items

were bathing(43.6%), grooming(39.6%), walking(36.5%) and dressing(36.3%) and the two leading difficult IADL items were preparing meals(68.6%) and handling money(61.8%). The three leading easiest PADL items were toileting(60.2%), getting in and out of bed(50.0%) and walking (50.0%), the two leading easiest IADL items were taking medications(30.4%) and going shopping(28.4%).

In Table 3, regarding the complete independence group(CI) of PADLs, the mildly demented patients, i.e. CDR1(63.0%~82.3%), had a higher proportion in the CI group than did the severely demented patients, i.e. CDR≧3,(0-33.3%). Similary, regarding the complete independence group(CI) of IADLs, The mildy demented patients, i.e. CDR 1 (33.8%－44.6%), had a higher proportion in the CI group than did the severely demented patients, i.e. CDR≧3,(0－5.3%).

Table 4 revealed that for both PADL and IADL scales, the other types of dementia had the highest scores in both scales, i.e. less dependent. However, the Mixed type of dementia had the lowest scores in both scales, i.e. more dependent, of the four types of dementia. We also found that the more severely demented patients, i.e. patients with higher CDR were significantly associated with the poorer performance on both PADL and IADL scales.

4、Discussion

The present study uses sensitive neuropsychological and neurobehavioral evaluation resulted in improved methods of detection. Consequently, the incidence rate of dementia has apparently increased. The present study is by far the largest to date of dementia in the elderly of Taiwan. It was determined that AD and VaD were the two main causes of dementia. The most common causes of death for demented patients were infection, cardiovascular disease, stroke, and accident. All of which are related to underlying causes of the dementing diseases.

Types of dementia are Alzheimer's type accounting for 50% to 60% of cases, vascular dementia has been reported to 15% to 20%, mixed dementia(a combination of the above) 20%, and Parkinson-associated dementia 10% to 15% (Burke, Larmie, 2000).

Sexual dimorphism was found to exist in patients with dementia and was adjusted in our inferences. Our study shows that females are predominant among

AD patients, as has also been found in other studies (Morris, Scherr, Hebert, et al., 2001; Green, Cupples, Go, et al., 2002; Galasko, Salmon, Gamst, et al., 2007). Female predominance could be explained by the relatively longer life expectancy of females, and the disproportionate number of females surviving into the period of greatest risk for AD (Fratiglioni , Grut , Forsell et al., 1991；Friedland RP. 1993；Liu CK, Lai CL, Tai CT, etal, 1998).Female predominance may also be explained by environmental influences, such as a lack of social contacts, health care, and work opportunities.

Alzheimer's disease is the most common cause of dementia in old age, characterized by insidious onset and inexorable progression. It is characterized by deteriorations in cognition and ability to function, cognitive decline is manifest as short-term memory, language and visuospatial deficits. These, along with deficits in perception and executive function affect the patient's ability to function, as indicated by loss of ability to perform activities of daily living (ADLs). Loss of function that causes patients to require increasing levels of care. This is distressing for the patient, and contributes to the burden that caregivers experience (Galasko D. 1998). The risk factors for AD were increased age, female sex, low education (iliteracy), Apolipopr-otein E4 (APOE)(Liu CK, Tai CT, Lin RT et al., 2000; Galasko, Salmon, Gamst, et al., 2007) and a history of major head injury.

Table 1 shows the proportionate increase of dementia with age. the proportion of AD increased with age, but, the proportion of VaD that did not increase with age was suspected to be due to the higher mortality rate of VaD. (Lin RT, Lai CL, Tai CT et al., 1998) Consequently, AD was the most commonly detected cause of dementia.

However, VaD tended to affect more male than females. Man's predominance in VaD reflects the higher incidence of stroke among men. VaD was mostly related to the nature of the stroke (Liu CK, Miller, Cummings et al., 1992；Gorelick , Chatterjee , Patel et al., 1992；Lin RT , Lai CL , Tai CT, Liu CK, Howng SL. 1998；Zhu, Fratiglion, Guo et al., 1998；Liao CC. 2006) and was also related to hypertension, cigarette smoking, diabetes mellitus, alcohol consumption, and hyperlipidemia.

Stroke is a major cause of disability in the elderly and is also related to the development of dementia (Zhu, Fratiglioni, Guo et al.,1998; Liebetrau et al.,2003;

Roman GC, 2003).Vascular dementia, causally related to stroke, always induced physical disability such as paralysis, limb rigidity, spasticity and gait abnormality (Cummings, Benson, 1992). The prevalence of disability in bathing, dressing, toileting, transfer and continence among patients were 54.4%, 37.9%, 40.5%, 22.9%, 24.8% respectively (Zhu, Fratiglioni, Guo et al., 1998). VaD patients also had much difficulty in problem solving, which may be due to the fact that VaD patients frequently have frontal dysfunction and physical disability to conduct the task (Shiau, Yu, Yuan et al., 2006). The cost of medical support for stroke is a burden for the family and for the society as well (Liao CC. 2006). Liao (2006) reported healthy diet and regular physical activities may reduce the risk of stroke.

Vascular dementia (VaD) is associated with impairments in cognitive, motor, and functional domains. VaD patients often display neurologic dysfunciton and neurobehavioral impairments influenced ADL performance and causes of impaired functioning in dementia patients were often complicated. Adequate performance of PADLs and IADLs is required for independent living, impaired PADLs and IADLs are associated with increased caregivers' burden, higher health care expenditures, and decreased time to institutionalization among dementia patients (Boyle, Cohen, Paul et al., 2002).

Mixed type of patients with dementia, combining AD and VaD, showed the worst performance in either PADL or IADL items among the four types of patients with dementia, as shown in Table 2 and Table 4. Katz reported that bathing was the most complicated task of the six daily activities(bathing, upper dressing, using the toilet, bed/chair transfer, bladder and bowel management, and eating). (Katz, Ford, Moskowitz, 1963). The present study showed that bathing, grooming and dressing were three leading most difficult ADL items, which is consistent with other studies (Wu, Hsu, Chuang .d. Chang. 1996; Guo. Yeh, Lin, et al., 1999; Rogers, Holm, Burgio et al., 2000; Cotter, E.M., Burgio, L.D., Stevens, et al., 2002; Shiau. Yu, Yuan et al., 2006). Furthermore, preparing meals, handling money and doing housework were the three leading difficult IADL items for the demented elderly (Boyle, Cohen, Paul, et al., 2002; Chen, Zhang, Huang et al., 2004; Desai, Grossberg, Sheth,2004).

The present study also determined that the functional status of both ADLs and IADLs were significantly associated with the type of dementia and with the Clinical

Dementia Rating (CDR) of patients with dementia. Regarding either PADL or IADL scales, the mixed type of dementia had the lowest scores in either ADL scale, i.e. less independent, of the four types of dementia. Table 4 shows PADL scores were higher than IADL, because functional loss starting with high level and transportation and progressing to losses in PADL (Gerdner and Hall 2001). In past studies, the mixed type of dementia was often misclassified as VaD, that is, VaD was overestimated and the mixed type was underestimated (Yoshitake. Kiyohara Kato, et al., 1995). Taking this into account, the present study avoided this mistake and found that the incidence rate of the mixed type of dementia was consistent with earlier studies (White, Petrovitch, Ross, et al. 1996). We also found that the more severely demented patients, i.e. patients with higher CDR, were significantly associated with poorer performance on both PADL and IADL scales. The higher CDR stage obstained the poor functional performace in both PADL and IADL (Table4),need more assistance. Furthermore, the mixed type of dementia patients were found to have a higher mortality rate that could be related to the severity of underlying disease, and may explain the lower incidence rate than either AD or VaD.

In dementia, functional impairment is associated with two major types of abilities; Physical activities of daily liveng (PADL) and Instrumental activities of daily living (IADL).PADL refers to basic activities necessary for one's routine comfort and well-being, and IADLs are more complex activities needed to carry out self-care activities. IADLs is a combination of physical and cognitive abilities reflecting performance of more complex activities. The completion of IADLs involves sequencing, judging, and organizational ability, all of which entail executive control. Bell-McGinty et al. suggested that, with a decrease in executive control, a breakdown in performing complex behavioral procedures, such as handling finances and managing medications, is likely (Bell-McGinty, Podell, Franzen. 2002). The present study reveals that handling money is one of the leading difficult IADL items.

Information on PADLs, may increase the specificity and sensitivity of the diagnosis of dementia (Warren, Grek, Conn et al., 1989). The assessment of IADLs could provide crucial guidance in the clinical diagnosis of early stage AD (Gauthier Gelinas, Gauthier. 1997). Performance on specific IADL items (such as telephones

use, use of means of transportation, responsibility for medication intake, handling finances) can also be used to screen for very early dementia (Barberger-Gateau, Commenges. Gagnon et al., 1992). Therefore, the ability to perform PADL and IADL are critical indicators of an individual's ability to live independently (Katz SK. 1983; Bolye, Chen, Paul et al., 2002; Desai , Grossberg and Sheth., 2004).

To assist patients in accomplishing bathing, grooming, and dressing tasks, general principles (i.e., promote as much function and independence as the patient and situation allow, or "help-but-do-not-do" as long as possible) should be mentioned first, and then the following information and intervention should be informed to the caregivers. Firstly, bathing must be performed in a wet and slippery environment, which poses safety concerns, bathing chairs can be used when getting in and out of the bathtub. Extended-handle brushes for bathing should be also available. Use of a hand-held shower device may be helpful for showering. Secondly, grooming can enhance self-esteem and improve hygiene. We suggest the patient maintain an easy to care for hairstyle. Some suggestions for caregivers should be mentioned: electric razors are easier for shaving, allowing the patient to shave himself as long as possible, make-up will enhance the patient's self-image, the patients should brush their own teeth as long as possible, and the deodorant should be used if necessary. Lastly, dressing is a complex activity that involves sequencing and perception as well as the physical act of donning and doffing clothing. When assisting with dressing, offer one item of clothing at a time. Soft, comfortable, clean-durable, adhesive strip and length fitable clothing should be considered. Simplify clothing can be made easier to handle by adding self-care devices to the pull so that a weak or uncoordinated hand can pull it up and down. A patient with hemiplegia is taught to dress by placing clothing on the affected arm or leg first. When undressing, the hemiplegia is instructed to undress the unaffected arm or leg first.

This study showed toileting and walking were the easiest PADL items, it includes bladder management and bowel management. Bladder management was more difficult than bowel management. Urge incontinence in AD may relate to dysfunction of sphincter control and forgetfulness from central degenerations. However, stroke can cause bladder dysfunction, resulting in neurogenic bladder and

uninhibited bladder, causing incontinence, which may be aggravated by memory lapses, inattention, emotional factors, inability to communicate, and impaired physical mobility (Black, Hawks, Keene, 2001; Shiau, YU, Yuan, et al., 2006).In our study, toileting and walking were the easiest in PADLs. Bladder and bowel management was the most tough task for the dementia patients. Some suggestions should be used for the caregivers: schedule toileting times for urge or functional incontinence to habit training, provider good skin care to perianal area,visual aids such as big-lettered signs or a picture of the toilet, fluorescent marker and well lighted and provide unconditional positive regard for the performance. Protective, absorbency pad will be needed for the bedridden dementia elderly. Although walking was easy PADL item, we should provide unobstractive way for walking and pacing to prevent for falling. A regular walk through the neighborhood or time is helpful both physically and mentally.

In assisting patients to prepare meals, handle money and do house work, the use of simple meal plans, simple cooking device, reliable family or friends helping handle money tasks, and introducing adaptive devices to do house work, the caregivers can teach the patient and family about related adaptive equipments and techniques. Furthermore, the assistance should be individualized according to the need of each demented patient. Household chores that aren't too complex for the person's memory can promote a sense of purpose and a feeling of helpfulness (Scherder, Dekker, Eqqermont,2008).

The present study provides more precise diagnoses and findings. Recently there has been an increased understanding of dementing illnesses, in general and of Alzheimer's disease, and contemporary studies have applied more sensitive assessment methods (KoKmen, Beard, O'Brien, et al., 1993). Additionally, the criteria for the diagnosis of dementia and its subtypes, i.e., AD and VaD, have been better established. (American Psychiatric Association 1987; WHO. 1991; Roman, Tatemichi, Erkinjuntti, et al.,1993; McKhann, Drach-man, Folstein, et al., 1994). Healthcare provides should aware that ADLs (PADLs and IADLs) are good predictors in diagnosing dementia, and are associated with different types of dementia, different severity of dementia (CDR) and different degree of dependency. These suggestions and findings could be of practical value in diagnosing, staging,

managing and following up on demented patients and could prove a valuable reference for dementia policy and decision making.

5、Acknowledgments

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Table 1.Demographic characteristics of dementia patients

Variables	Total N(%)	AD n=64 N(%)	VaD n=21 N(%)	Mixed Type n=8 N(%)	Others n=9 N(%)	χ^2value
Gender						
Male	45(44.1)	21(32.8)	13(61.9)	5(62.5)	6(66.7)	$\chi^2 = 8.97$*
Female	57(55.9)	43(67.2)	8(38.1)	3(37.5)	3(33.3)	
Age(Y)						
<74	35(34.3)	14(21.9)	15(71.4)	1(12.5)	5(55.6)	$\chi^2 = 20.72$**
≧75	67(65.7)	50(78.1)	6(28.6)	7(87.5)	4(44.4)	
Education						
Illiterate	67(65.7)	48(75.0)	11(52.4)	4(50.0)	4(44.4)	$\chi^2 = 6.79$
Literate	35(34.3)	16(25.0)	10(47.6)	4(50.0)	5(55.6)	
Severity of Dementia						
CDR1	65(63.7)	45(70.3)	13(61.9)	2(25.0)	5(55.6)	$\chi^2 = 9.90$
CDR2	18(17.6)	7(10.9)	6(28.6)	3(37.5)	2(22.2)	
CDR3, 4, 5	19(18.7)	12(18.8)	2(9.5)	3(37.5)	2(22.2)	

AD=Alzheimer's disease; VaD= vascular dementia; CDR= clinical dementia rating.

*P＜0.05　**P＜0.01　***P＜0.001

Table 2.Degree of dependency in different types of dementia patients in ADLs

ADL items	AD(n=64) %			VaD(n=21) %			Mixed Type(n=8) %			Others(n=9) %			Total(n=102) %		
	CI	PA	CD	CI	PA	CD	CI	PA	CD	CI	PA	CD	CI	PA	CD
PADLs															
Eating	56.2	18.8	25.0	33.3	19.0	47.7	25.0	25.0	50.0	44.4	44.4	11.2	48.0	21.6	30.4
Dressing	54.6	14.1	31.3	33.3	14.3	52.4	25.0	12.5	62.5	44.4	44.4	11.2	47.0	16.7	36.3
Grooming	57.1	9.5	33.4	23.8	14.3	61.9	25.0	12.5	62.5	44.4	44.4	11.2	46.5	13.9	39.6
Walking	57.4	8.2	34.4	30.0	20.0	50.0	14.3	28.6	57.1	75.0	25.0	0.0	50.0	13.5	36.5
Getting in and out of bed	59.7	9.7	30.6	28.6	19.0	52.4	12.5	37.5	50.0	66.7	22.1	11.2	50.0	15.0	35.0
Bathing	53.1	14.1	32.8	23.8	19.0	57.2	12.5	50.0	37.5	50.0	25.0	25.0	37.6	18.8	43.6
Toileting	63.5	30.2	6.3	52.6	26.3	21.1	50.0	37.5	12.5	62.5	37.5	0.0	60.2	30.6	9.2
IADLs															
Using phone	25.0	25.0	50.0	14.3	14.3	71.4	0.0	12.5	87.5	37.5	12.5	50.0	21.8	20.8	57.4
Getting place	26.6	32.8	40.6	19.0	23.6	57.4	0.0	37.5	62.5	33.3	37.5	29.2	23.5	32.4	44.1
Going shopping	34.4	15.6	50.0	19.0	4.8	76.2	0.0	0.0	100.0	33.3	0.0	66.7	28.4	10.8	60.8
Preparing meals	26.6	12.5	60.9	9.5	9.5	81.0	0.0	0.0	100.0	33.3	0.0	66.7	22.6	8.8	68.6
Doing homework	28.6	20.6	50.8	14.3	9.5	76.2	0.0	0.0	100.0	33.3	0.0	66.7	23.8	14.8	61.4
Taking medication	35.9	25.0	39.1	28.6	14.3	57.1	0.0	37.5	62.5	29.2	37.5	33.3	30.4	25.5	44.1
Handling money	25.0	21.9	53.1	19.0	9.5	71.4	0.0	0.0	100.0	33.3	0.0	66.7	21.6	16.6	61.8

AD=Alzheimer's disease; VaD= vascular dementia; ADLs=activities of daily living; PADLs= physical activities of daily living;
IADLs= instrumental activities of daily living; CI= complete independence; PA=partial assistance; CD= complete dependence.

Table 3. Degree of dependency in varying severity of dementia patients in ADLs

ADLs items	Mild(n=65) (CDR1) %			Moderate(n=18) (CDR2) %			Severe(n=19) (CDR≧3) %			Total(n=102) %		
	CI	PA	CD	CI	PA	CD	CI	PA	CD	CI	PA	CD
PADLs												
Eating	63.0	18.5	18.5	22.2	27.8	50.0	21.1	26.3	52.6	48.0	21.6	30.4
Dressing	64.6	15.4	20.0	16.7	11.1	72.2	15.8	26.3	57.9	47.0	16.7	36.3
Grooming	65.7	10.9	23.4	16.7	11.1	72.2	10.5	26.3	63.2	46.5	13.9	39.6
Walking	63.5	11.1	25.4	14.3	35.7	50.0	31.5	5.3	63.2	50.0	13.5	36.5
Getting in and out of bed	64.1	9.3	26.6	16.7	38.9	44.4	33.3	11.1	55.6	50.0	15.0	35.0
Bathing	65.7	10.9	23.4	11.1	33.3	55.6	0.0	31.5	68.5	37.6	18.8	43.6
Toileting	82.3	12.9	4.8	33.3	55.6	11.1	11.1	66.7	22.2	60.2	30.6	9.2
IADLs												
Using phone	34.3	26.6	39.1	0.0	16.7	83.3	0.0	5.3	94.7	21.8	20.8	57.4
Getting place	36.9	33.8	29.3	0.0	33.3	66.7	0.0	26.3	73.7	23.5	32.4	44.1
Going shopping	41.5	15.4	43.1	0.0	11.1	88.9	0.0	5.3	94.7	28.4	10.8	60.8
Preparing meals	33.8	12.4	53.8	5.6	5.6	88.9	0.0	0.0	100.0	22.6	8.8	68.6
Doing homework	35.9	21.9	42.2	5.6	5.6	88.9	0.0	0.0	100.0	23.8	14.8	61.4
Taking medication	44.6	30.8	24.6	5.6	22.2	72.2	5.3	10.5	84.2	30.4	25.5	44.1
Handling money	33.8	21.6	44.6	0.0	11.1	88.9	0.0	5.3	94.7	21.6	16.6	61.8

CDR= clinical dementia rating; ADLs= activities of daily living; PADLs= physical activities of daily living;

IADLs= instrumental activities of daily living; CI= complete independence; PA= partial assistance; CD= complete dependence.

Table 4 .Multivariate association between PADLs /IADLs and the type of dementia, and association between PADLs /IADLs and the severity of dementia

Group	(N)	Physical ADLs M ± SD	Instrumental ADLs M ± SD
Types of dementia			
AD	(64)	16.25 ± 5.69	12.59 ± 5.62
VaD	(21)	13.33 ± 5.75	10.38 ± 5.12
Mixed	(8)	12.57 ± 5.13	7.88 ± 1.13
Others	(9)	18.43 ± 2.94	12.76 ± 5.50
Total		15.56 ± 5.67	11.76 ± 5.50
F value		F=3.30*[+]	F=3.75*[+]
Severity(CDR Staging)			
I.CDR 1	(65)	17.52 ± 5.17	13.94 ± 5.67
II.CDR 2	(18)	11.93 ± 4.67	8.50 ± 3.07
III.CDR≧3	(19)	11.65 ± 4.73	7.63 ± 1.07
Total		15.56 ± 5.67	11.76 ± 5.50
F value		F = 13.90***	F = 19.68***

AD= Alzheimer's disease; VaD= vascular dementia; CDR= clinical dementia rating

PADLs= Physical activities of daily living; IADLs= Instrumental activities of daily living

* P < 0.05, **P<0.01, ***P<0.001

+ : The F value was estimated by adjusting gender.