ORIGINAL ARTICLE

Proportion of Dementia and its Associated Factors Among Elderly Patients Attending Outpatient Clinics of Universiti Sains Malaysia Hospital

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SUMMARY

The increase in life expectancy observed over the last decade has particular relevance for conditions such as cognitive decline and dementia. This is a cross sectional study to determine the rate of dementia and to identify its associated factors among 399 elderly patients attending outpatient clinics of Universiti Sains Malaysia Hospital. This study was conducted in 2 phases. In the first phase, the literate subjects were screened using validated Malay version of Mini Mental State Examination (MMSE) and the illiterate subjects with Malay version of Elderly Cognitive Assessment Questionnaire (ECAQ). All subjects suspected to have dementia were selected for further evaluation in phase 2 of this study. The second phase involved full clinical examination in order to establish clinical diagnosis of dementia. The proportion of dementia in this study was 2.5% (10). Although history of exposure to pesticide ($p<0.05$) and history of stroke ($p<0.05$) were significant, they were not significant factors. These were because vast discrepancy in number between those exposed to pesticide and having stroke between dementia and non dementia.

KEY WORDS:
Cognitive impairment, Dementia, Elderly, Geriatric

INTRODUCTION

In Malaysia, as in most countries, the proportion of older persons is increasing rapidly. The proportion of those age 60 years and above in Malaysia had risen from 6.2% in 1998 to 6.5% in year 2004. The projection for the elderly (age more than 60 years and above) population in Malaysia is 8.3% in year 2010 and 11.3% in year 2020. Dementia is one of the most severe mental health problems commonly found in the aged population. In the United States, approximately 10% of the population older than 65 years of age suffers from dementia, with Alzheimer Disease accounting for about 2/3 of the cases[1]. In European countries, the prevalence of dementia is 6.4% and it increases with increasing age[2].

Dementia is defined as acquired global impairment of higher cortical functions including memory, the capacity to solve problems of day to day living, the performance of learned perceptuo-motor skills, all aspects of language and communication and the control of emotional reaction, in the absence of clouding of consciousness[3]. Hence, it is not a diagnosis but a syndrome, that is, a collection of symptoms and signs without regard to cause. The condition is often progressive though not necessarily irreversible[3].

Epidemiological studies of risk factors have been seen as useful by adding to knowledge about what is 'normal' and 'pathological' ageing, and about the nature of dementia. Some factors may increase the risk of dementia and cognitive impairment, others may be protective. Increasing age, family history of dementia, female, low socio economic group, alcohol and smoking had been associated with an increased risk for dementia[4,5,6]. However, statin and non steroidal anti inflammatory drugs have been associated with lower risk of dementia[7,8].

Patients who had not received a dementia diagnosis accounted for 50% - 60% of all cases of dementia in primary care samples[9]. It is important to have reliable estimates of the prevalence of dementia as this would enable more accurate provision and planning of optimal care for the affected elderly in the community[9]. By identifying the risk factors of dementia, subjects who are at risk for the development of dementia will be identified and this will provide guideline for family physician on choosing subjects that need cognitive screening. Studies on the prevalence of dementia are encouraged. So the purpose of this study is to assess the rate of dementia among elderly patients attending the out patient clinics in University Sains Malaysia Hospital.

MATERIALS AND METHODS

This is a cross sectional study conducted in out patient clinics of Universiti Sains Malaysia Hospital (HUSM) from January to December 2006. HUSM is one of the teaching hospitals and it is situated in the east coast of Peninsular Malaysia. The inclusion criteria were those aged 65 years and above and gave informed consent, and the exclusion criteria were severe mental disorder, mental retardation, those who already diagnosed as dementia and subjects who is deaf, dumb or blind. The sampling method is systematic sampling where every five subject was chosen for the interview.

This study was conducted in 2 phases. In the first phase, all subjects and /or caregivers were interviewed on demographic data and risk factors of dementia such as family history, medical history and subjects' lifestyles. Validated Malay

This article was accepted: 22 April 2009
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version of Mini Mental state examination (MMSE) were used on literate subjects and Malay version of Elderly Cognitive Assessment Questionnaire (ECAQ) were used on illiterate subjects. All subjects scoring 17 or less on Malay version of MMSE or 5 or less on ECAQ were regarded as having cognitive impairment subjected for further evaluation in second phase of this study.

The second phase involved the clinical interview based on DSM IV criteria and full clinical examination including physical, neurological and psychiatric examination. Caregivers of each patient were also interviewed to determine deterioration of patient in social and occupational functioning. Patient's medical records were also reviewed to aid in the diagnosis and to obtain information regarding patient's medical illness and medication used by them.

The DSM–IV (American Psychiatric Association, 1994) criteria are as stated below:

A. The development of multiple cognitive deficits manifested by both:
1. Memory impairment (impaired ability to learned new information or to recall previously learned information)
2. One (or more) of the following cognitive disturbances:
a. aphasia (language disturbance)
b. apraxia (impaired ability to carry out motor activities despite intact motor function)
c. agnosia (failure to recognize or identify object despite intact sensory function)
d. disturbance in executive functioning (i.e planning, organizing, sequencing, abstracting).

B. The cognitive deficits in criteria A1 and A2 each cause significant impairment in social and occupational functioning and represent a significant decline from a previous level of functional.

MMSE and ECAQ are structured interview instruments to assess the cognitive function. The MMSE is a structured interview instrument and was subscale into six factors namely orientation, attention, calculation, registration, recall, language and construction. These six factors will contribute to the total 19 questions and has maximum score of 30 points and the minimum score is O. In Malaysia, MMSE has been translated and validated by Zarina *et al*[11]. Satisfactory levels of sensitivity and specificity were obtained which were 84% and 84.6% respectively with positive predictive value and negative predictive value of 81.0% and 87.1% respectively when a cut off point of 17 and below was adopted to screen out suspected dementia cases.

ECAQ is a ten-item cognitive test to assess two aspects of cognitive function (memory and information – orientation) and has a maximum score of 10 points and minimum score of 0[12].

Based on validation worked done in Singapore, the ECAQ has an optimal cut off score of 5/6 (where scores of 5 and below optimally identified dementia), with a sensitivity of 85.3% and a specificity of 95. One percent with positive predictive value of 82.8%[12].

Statistical Methods

Data entry and analysis were done by using SPSS version 12.0.1 Frequency and percentages for categorical variables were calculated. Meaningful combination of categories was done when it was indicated. Univariate simple logistic analysis was used to determine the associated factors for dementia. The dependent variable was dementia and the independent variables were sociodemographic characteristics, familial factors, medical history and lifestyles.

RESULTS

A total of 399 respondents completed the interview for phase 1 study. The response rate for the first phase is 100% and the second phase is 83% (39/47). Forty seven cognitively impaired respondents were recruited for second phase of the study. However, eight (8) of them could not be assessed further due to various reasons; 1 had died, 2 went away, 3 could not be traced and 2 refused further evaluation.

Majority of the respondents (66.2%) were from age group 65-74 years old. The youngest was 65 years old and the eldest was 92 years old. Mean age of respondents were 72.95 (72.95 ± 4.91). Male respondents were 50.6% and female respondents were 49.4%. Majority of the respondents were Malay (91.2%). The summary of socio-demographic and clinical characteristics of the respondents is given in Table I.

The proportion of dementia in this study was 2.5%. In phase 2, among 39 cognitively impaired respondents, 10 were found to have dementia and two were found to have depression. There were 29 respondents who had cognitive impairment but not fulfilled the criteria for the diagnosis of dementia. Univariate analysis for the associated factors for dementia showed that history of exposure to pesticide and history of stroke were significantly associated with dementia. (Table II and Table III)

DISCUSSION

Epidemiological reports about dementia and in elderly people from developing countries including Malaysia are scarce. We could not find any reported study in Malaysia reporting the prevalence of dementia in elderly by using a two-stage method. However, most of the studies on prevalence of dementia were done in two stage method which were similar to this study even though they used different screening tools or diagnostic criteria[4,13,14]. The main problem is lacking of validated screening tool for our Malaysian population. Thus, in this study we wanted to assess the proportion of dementia using a two-stage study that includes clinical interview for a more accurate assessment and also by using a local validated tool for the cognitive assessment.

A study done by Kua and Ko in Singapore using two stage method of ECAQ as screening tool and subjecting those with score of 5 and less for second stage using Geriatric Mental State Schedule (GMSS) [13]. They found that the prevalence of dementia was 2.5% among Chinese and 4% among Malay[13]. In comparison to the prevalence of dementia among the Malay population in Singapore, the present study had a lower prevalence of dementia. This is probably due to higher

Table I: Socio-demographic and clinical characteristics of elderly patients attending outpatient clinics HUSM

Variables	mean ± SD	Distribution of respondent (n=399)	
		Number	Percentages (%)
Age			
65-69		113	28.3
70-74		150	37.8
75-79		93	23.3
≥ 80		42	10.5
(years ± SD)	72.95 ± 4.91		
Sex			
Male		202	50.6
Female		197	49.4
Race			
Malay		364	91.2
Chinese		31	7.8
Others		4	1.0
Marital status			
Never married		3	0.8
Married		247	61.9
Widowed, divorced, separated		148	37.1
Education			
No formal education		166	41.6
Primary		172	43.1
Secondary		39	9.8
Tertiary		22	5.5
Current living			
Spouse and children		174	43.6
Children		90	22.6
Spouse only		96	24.1
Other relatives		5	1.3
Alone		32	8.0
Other		2	0.5
Number of living			
3		236	59.1
4-7		136	34.1
≥ 8		27	6.8
Main economic			
Work		32	8.0
Family		193	48.4
Pension		119	29.8
Welfare		9	2.3
Others		46	11.5
History of hypertension			
No		90	22.6
Yes		309	77.4
History of dyslipidemia			
No		212	53.1
Yes		187	46.9
History of IHD			
No		280	356
Yes		119	43
History of diabetes			
No		290	72.7
Yes		109	27.3
History of joint problems			
No		290	72.7
Yes		109	27.3
History of stroke			
No		350	89.2
Yes		49	10.8
History of smoking			
Never smoke		196	49.1
Current smoker		39	9.8
Past smoker		164	41.1

Table II: The association between socio-demographic factors with dementia among elderly patients attending outpatient clinics HUSM

Variables	No dementia n=381 (%)	Dementia n=10 (%)	P value [b]
Age			
< 70 years	111 (29.1)	1 (10.0)	0.293
≥ 70 years	270 (70.9)	9 (90.0)	
Sex			
Male	200 (52.5)	2 (20.0)	
Female	181 (47.5)	8 (80.0)	0.550
Race			
Malay	348 (91.3)	9 (90.0)	
Non Malay	33 (8.7)	1 (10.0)	0.602
Marital status			
Married	241(63.3)	5 (50.0)	
others	140 (36.7)	5 (50.0)	0.509
Education			
Yes	229 (60.1)	3 (30.0)	
No	152 (39.9)	7 (70.0)	0.098
Years of education			
< 7 years	82 (21.5)	0 (0.0)	
≥ 7 years	299 (78.5)	10 (100.0)	0.130
Income			
≤ RM 500	236 (62.1)	9 (90.0)	0.990
> RM 500	144 (37.9)	1 (10.0)	
Main economic			
Family	182 (47.8)	7(70.0)	0.208
others	199 (52.2)	3 (30.0)	
182 (47.8)			
Exposure to pesticides			
No	273 (71.7)	3 (30.0)	
Yes	108 (28.3)	7 (70.0)	0.009

[b]fischer exact was used for the significance of the group difference

Table III: The association between medical history and lifestyles factors with dementia among elderly patients attending outpatient clinics HUSM

Variables	No dementia n =381(%)	dementia n =10 (%)	p value[b]
History of thyroid disease			
No	367 (96.3)	9 (90.0)	
Yes	14 (3.7)	1 (10.0)	0.327
History of Peptic ulcer disease			
No	342 (89.8)	8 (80.0)	
Yes	39 (10.2)	2 (20.0)	0.282
History of IHD			
No	269 (70.6)	8 (80.0)	0.730
Yes	112 (29.4)	2 (20.0)	
History of other heart problems (CCF, AF,CRHD)			
No	338 (88.7)	10 (100.0)	0.610
Yes	43 (11.3)	0 (0.0)	
History of stroke			
No	336 (88.1	6 (60.0))	0.026
Yes	45 (11.8)	4 (40.0)	
History of diabetes			
No	276 (72.4)	8 (80.0)	0.734
Yes	105 (27.6)	2 (20.0)	
History of hypertension			
No	87 (22.8)	2 (20.0)	1.000
Yes	294 (77.2)	8 (80.0)	
History of dyslipidemia			
No	203 (53.3)	5 (50.0)	1.000
Yes	178 (46.7)	5 (50.0)	

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History of depression			
No	377 (99.0)	10 (100.0)	1.000
Yes	4 (1.0)	0 (0.0)	
History of joint problems			
No	273 (71.7)	9 (90.0)	0.295
Yes	108 (28.3)	1 (10.0)	
History of statin used			
No	204 (53.8)	8 (80.0)	0.121
Yes	175 (46.2)	2 (20.0)	
History of NSAIDS used†			
No	127(33.6	5 (50.0)	0.318
Yes	251(66.4)	5 (50.0)	
History of head injury			
No	338 (88.7)	7 (70.0)	0.101
Yes	43 (11.3)	3 (30.0)	
History of alcohol used			
No	366 (96.1)	9 (90.0)	0.341
Yes	15 (3.9)	1 (10.0)	
History of smoking			
Never smoke	184(48.3)	5 (50.0)	1.000
Ever smoke	197 (51.7)	5 (50.0)	

† n=388 (missing 11 respondents)
[b]fischer exact was used for the significance of the group difference

proportion of younger subjects; moreover, this study is done at a tertiary centre.

The epidemiology of dementia in elderly in non-western population especially in developing countries has not been widely known. Recent studies have suggested that the prevalence of dementia in this study is similar to other developing countries. In a two phase study done in urban community in Beijing[14], the prevalence of dementia is 2.68% in the elderly above 60 years and older and in a study in India[15], the prevalence of dementia in the elderly age 65 years and above was 2.44%. The prevalence of dementia in this study is lower than most reported studies done in western countries – Italy 9.8%[16] and Amsterdam 13.3%[17]. In general, estimates of prevalence rates from Asian nations have somewhat lower than from Europe due to their longer life expectancy compared to Asian counterpart. Thus, percentage of very old group of elderly is higher in that part of the world.

In this study, there were 29 respondents who had cognitive impairment but did not fulfilled the criteria for diagnosis of dementia. Several names have been applied to this entity including cognitive impairment no dementia, age-associated cognitive decline or mild cognitive impairment. The definitions of and the distinctions between mild cognitive disorder, age-associated cognitive decline and mild cognitive impairment are controversial and the discussion about these issues is out of scope of this paper. However, these respondents need to be follow-up because they were at risk for dementia[18]. And further study is suggested to follow up these cognitively impaired patients in order to determine the rate of conversion of these patients into dementia.

From our study based on univariate analysis, factors that were found to be associated with dementia were occupational exposure to pesticide and history of stroke. These factors were significant not because they were associated factors, but because of the vast discrepancy in number of those expose to pesticide and had stroke between dementia and non dementia respondents. Thus, we suggested large longitudinal study of incidence is needed before any conclusive findings of associations between the factors discovered and dementia can be established.

As more treatment options become available, screening and earlier treatment of dementia will reduce the burden of suffering of this syndrome[19,20]. Primary care providers would need a brief, accurate screening test that could be applied during routine office visits. It is important for the primary care providers not to assume that positive screening test necessarily means that the patient have dementia. Clinical assessment that could be performed by the primary care physician or a specialist, such as a geriatrician or neurologist is important in the diagnosis of dementia. Finally, knowledge of dementia at an early stage could improve health outcomes through more effective treatment.

ACKNOWLEDGEMENTS

We would like to acknowledge the Research and Ethical Committee of Medical Sciences, University Science Malaysia for approving this study. We also gratefully acknowledge the cooperation of all participating workers, including medical and health officers and all categories of staffs involved in this project.

REFERENCES

1. Hendrie HC. Epidemiology of Dementia and Alzheimer's disease. Am J Geriatr Psychiatry 1998; 6(Suppl 1): S3-18.
2. Lobo A, Saz P, Marcos G, Dia JL, Camara DL. The prevalence of dementia and depression in the elderly community in a southern European population. The Zaragoza Study. Arch Gen Psychiatry 1995; 52: 497-505.

3. Royal College of Physicians. Organic impairment in the elderly; implications for research, education and provision of services. 1982. A report of the Royal College of Physicians by the College Committee in Geriatrics, London.
4. Alvarado-Esquivel C, Hernandez-Alvarado AB, Tapia-Rodriguez RO. Prevalence of dementia and Alzheirmer's disease in elders of nursing homes and senior center of Durango City, Mexico.BMC Psychiatry. 2004; http://www.biomedcentral.com/1471-244x/4/3.
5. Launer LJ, Andersen K, Dewey ME *et al*. Rates and risk factors for dementia and Alzheimer's disease: results from EURODEM pooled analyses. EURODEM Incidence Research Group and Work Groups. European Studies of Dementia. Neurology 1999; 52(1): 78-84.
6. Reitz C, Luchsinger J, Tang MX, Mayeux R. Effect of smoking and time on cognitive function in the elderly without dementia. Neurology 2005; 65(6): 870-75.
7. Hajjar I, Schumpert J, Hirth V, Wieland D, Eleazer GP. The impact of the use of statins on the prevalence of dementia and the progression of cognitive impairment. J Gerontology A Biol Sci Med Sci. 2002; 57(7): 414-18.
8. Karplus TM, Saag KG. Nonsteroidal anti-inflammatory drugs and cognitive function: do they have a beneficial or deleterious effect? Drug Safety 1998; 19: 427-33.
9. Boustani M, Peterson B, Hanson L, Harris R, Lohr KN. Screening for Dementia in Primary Care : A Summary of the Evidence for the U.S. Preventive Service Task Force. Ann Intern Med. 2003; 138: 927-37.
10. American Psychiatric Association. 1994. Diagnostic and Statistical Manual of Mental Disorders, 4th ed (DSM-IV). Washington DC.
11. Zarina ZA, Zahiruddin O, Che Wan AH. Validation of Malay version of Mini Mental State Examination. Malaysian Journal of Psychiatry 2004; http://ejournal.psychiatry-malaysia.org/article.php?aid=5.
12. Kua EH, Ko SM. A questionnaire to screen for cognitive impairment among elderly people in developing countries. Acta Psychiatr Scand. 1992; 85: 119-22.
13. Kua EH, Ko SM. Prevalence of Dementia Among Elderly Chinese and Malay Residents of Singapore. Int Psychogeriatr 1995; 7(3): 439-46.
14. Wang W, Wu S, Cheng X, Dai H *et. al*. Prevalence of Alzheimer's disease and other dementing disorders in an urban community of Beijing, China. Neuroepidemiology 2000; 19: 194-200.
15. Vas CJ, Pinto C, Panikker D, Noronha S *et al*. Prevalence of dementia in an urban Indian population. Int Psychogeriatr 2001; 13(4): 439-50.
16. Ferini-Strambi A, Marcone P, Garanchi F *et al*. Dementing disorder in North Italy: prevalence study in Viscovata, Cremona Province. Eur. J. Epidemiol.1997;13: 201-4.
17. McCullagh CD, Craig D, McIlroy SP, Passmore AP. Risk factors for dementia. Adv Psychiatr Treatment 2001; 7: 24-31.
18. Daly MP. Diagnosis and management of Alzheimer Disease. J Am Board Fam Pract 1999; 12: 375-85.
19. Rogers SL, Farlow MR, Doody RS,Mohs R, Friedhoff LT. A 24-week, double-blind, placebo-controlled trial of donepezil in patients with Alzheimer's disease. Neurology 1998; 50: 136-45.
20. Sano M, Ernesto C, Thomas RG *et al*. A controlled trial of selegiline, alpha-tocopherol, or both as treatment for Alzheimer's disease. N Engl J Med 1997; 336: 1216-22.