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Prevalence of Dementia in a Primary Health Care Centre in Muar, Johor

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Abstract

Introduction :*As the health care system of Malaysia improves so does the living age of the Malaysian population. A fall in the mortality rates, better living standards , good nutrition and better medical facilities all predispose to an increase in the proportion of the elderly. As the age population curve skews towards the right there is also an increase in the number of diseases affecting the elderly. The commonest being dementia.*

Objective(s) : *A cross-sectional study was carried out in Klinik Kesihatan Maharani, one of the largest primary health care centres in Muar. The aim of this study was to describe the frequency and distribution of dementia. To identify risk factors that correlate with dementia.*

Methods : *Convenience sampling was used and using the 95% confidence interval, the minimum sample size required was 307 respondents .The dependent variable was dementia . Elderly Cognitive Assesment Questionnaire (ECAQ) and the Clock Drawing Test (CDT) were the neuropsychological tests used for this study .All those who scored 6 or below for ECAQ and 3 or more for the CDT which ever was significant were referred to a psychiatrist for further assessment.*

Results :*There were 313 respondents who participated in this study. The overall prevalence rate of dementia was 13.4% .The prevalence rate increased by fourfold every 10 years from 5.4% (65-74 years) to 28.1% (>75 years).Higher prevalences of dementia were found in female (19.9%), no education background(30.5%),Indians (33.3%), divorce/widowed (21.1%) and those staying in old folks home(69.2%).There was not much difference between smokers as compared to non-smokers and those from urban as compared to from rural areas .*

Keywords : *Dementia, Prevalence , Risk factors*

Introduction

In Malaysia, the proportion of older persons is increasing rapidly. Currently, Malaysia's population stands at 28.3 million out of which 27.6% represent between birth and 14 years of age ,while 67.3% are between 15 and 64 years .Those aged 65 and above make-up 5.1% of the total population.(1)

At present the number of Malaysians aged 60 years and above is estimated to be 1.4 million and is projected to increase to 3.3 million by the year 2020. According to the demographics of Malaysia, the life expectancy at birth of a Malaysian male is 71.05 years and that of a female is 76.73 years(1).

As the age-population curve skews towards the right proportionally there is also an increase in the number of diseases affecting the elderly, the commonest being dementia.

Dementia is defined as a decline in memory and other cognitive abilities, in the absence of clouding of consciousness for a minimum duration of 6 months(2). This is often manifested as a disturbance of intelligence, personality and a significant social and occupational decline from a previous level of functioning(3).

WHO estimates that more then 35 million people worldwide are living with dementia and this number is expected to double by 2020 and more then triple by 2050(6).Hence dementia is a major public health burden, as it has adverse psychosocial and economic consequences for the affected person and their families.

Limited number of studies have been carried out to determine the incidence and prevalence of dementia in Malaysia .With a rise in the ageing population it is important to acknowledge the issue of dementia, improve the services for the patient and promote healthy ageing . A previous study among the Malay urban settlements in Kuala Lumpur reported a prevalence of dementia of 6% among those aged 65 years and above and 12% in those aged 75 years[3]. While the study of socio-demographic risk factors and correlates of dementia in older Malaysians showed an overall prevalence of 14.3%. The prevalence rates doubling every ten years from 9.5% in the age group 60-69 years to 17.1% in those between 70 -79 years[5].

Material and methods

This was a descriptive cross-sectional study that was conducted in the out-patient department of Klinik Kesihatan Maharani, one of the biggest primary health care centres in Muar.

Muar also known as "Bandar Di Raja" is a town geographically situated in the northwestern region of Johor state, Malaysia. Muar covers a land mass of 2346.12 km^2 with a population of 239,027 out of which 19,280 are aged 60 years and above .This constitutes 8.06% of the total population of Muar (dept of statistics Muar-2010) [1].

Study Population : Muar residents above the age of 65 years attending the out-patient department were included in this study. Patients with stroke, aphasia, already diagnosed dementia ,psychotic disorders , unco-operative and violent patients were excluded .

Sampling Method : Convenience sampling method was applied in this study .Using the 95% confidence interval , the minimum sample size required was 307 respondents.

Data Collection and Tools : Data was collected by face to face interview using a structured questionnaire. A trained researcher was assigned to ask the questions of the Elderly Cognitive Assessment Questionnaire (ECAQ) and conduct the Clock Drawing Test (CDT).

ECAQ is a ten item cognitive test to assess two aspects of cognitive function and has a maximum score of 10 points and a minimum score of 0. The questionnaire has a sensitivity of 85.3%, specificity of 91.5% and a positive predictive value of 82.8 %[4].

The Clock Drawing Test is a simple test whereby the patient is required to draw a clock with all the numbers intact and the hands of the clock reading "10 minutes past 11". In this study, University of Iowa Healthcare scoring system was used where a score of >3 represented a cognitive deficit. A study that was conducted to asses five scoring methods of the CDT showed that there was minor difference in the outcome between the individual scoring manuals. All CDTs had a sensitivity and a specificity of around 86% and 87% respectively. The positive predictive value ranged from 93-97%[7].

Hence any respondent who scored 6 or below for ECAQ and 3 or more for the CDT whichever was significant was referred to psychiatrist for further assessment.

Ethical Consideration : This study was conducted after clearance from the Pejabat Kesihatan Daerah Muar and after approval from National Medical Research Register (NMRR) – NMRR ID : NMRR-12-688-12888.A verbal consent was sought from all respondents prior to the interview.

Statistical Analysis : The dependent variable was dementia while the independent variables were age , gender, level of education, ethnicity ,marital status , place of residence, smoking status and family support. Age was categorized into 2 groups 65-74 years (reference group) and more than 75 years. Sex was dummy coded as male =0 (reference category) and female =1. Education included no formal education (reference group),primary ,secondary and tertiary . Ethnicity included Malays, Chinese (reference group) and Indians. Marital status was divided into single (reference group)married and divorced/widowed. Place of residence and smoking status were dichotomized as urban = 1 and rural= 0(reference category), smoking =1 and non-smoking =0 (reference group) while surrounding environment was divided into staying with family(reference group) ,staying alone and staying in old folks home. Data was then analysed using the Statistical Package for Social Sciences . Chi-square test was used in this study and association between factors was considered to be statistically significant at $p<0.01$.

Results

There were 313 respondents who participated in this study. The overall prevalence rate of dementia was 13.4%. the prevalence rate increased by fourfold every 10 years from 5.4% (65-74 years) to 28.1% (>75 years).Higher prevalence rates of dementia were found in female(19.9%), no education background(30.5%),Indians(33.3%),divorce/wi dowed(21.1%) and those staying in the old folks home(69.2%).(table 1)

There was not much difference between smokers(14.9%) as compared to non-smokers(13.1%) and those from urban (13.1%) as compared to rural areas(14.5%).The female preponderance was four times. Divorced/ widowed respondents (21.1%) had 3 times the prevalence rate as compared to either single (6.7%) or married respondents (6.6%).The risk of dementia decreased with an increase in the level of education, with no formal education having a prevalence rate of 30.5% while those with tertiary education the prevalence rate was nil.

Binary logistic regression was used to estimate adjusted odds ratios of association with dementia for each socio-demographic variable in multivariate analyses that controlled mutually for differences in age, gender and education level (table 2 and table 3). The significant independent variables associated with dementia in a multivariate model included older age (the odds of dementia for those aged more then 75 years is 6 times more then that of persons aged 65-74 years) and gender (female having a 75% more likelihood chance of suffering from dementia compared to male).We can conclude those with no formal education, the odds of having dementia are 3.77 times higher than odds in primary education , 11.62 times higher than odds in secondary while 13.6 times higher than odds who finished their tertiary education to develop dementia. In the case of ethnic group, Malays were 2.5 times higher while Indians were 5 times higher compared to Chinese to suffer from dementia.

Table 1: Prevalence of dementia by socio-demographic factors:

Variable	Total (n=313)	Cases (n=42)	Prevalence (%)
Age			
65-74	203	11	5.4
>75	110	31	28.1
Sex			
Male	142	8	5.6
Female	171	34	19.9
Education			
No formal education	82	25	30.5
Primary	144	15	10.4
Secondary	55	2	3.6
Tertiary	32	nil	
Ethnicity			
Malay	99	20	20.2
Chinese	202	18	8.9
Indian	12	4	33.3
Marital status			
Single (unmarried)	15	1	6.7
Married	151	10	6.6
Divorced/Windowed	147	31	21.1
Place of Residence			
Urban	244	32	13.1
Rural	69	10	14.5
Smoking	47	7	14.9
Non-smoking	266	35	13.1
Family	264	25	9.5
Alone	36	8	22.2

Old Folks Home	13	9	69.2

Table 2: Distribution of Population according to dementia status

Variable	No dementia		Dementia		X^2
	N	%	N	%	
Age					
65-74	192	70.8	11	26.2	31.8183**
>75	79	29.1	31	73.8	
Sex					
Male	134	49.4	8	19.0	13.558**
Female	137	50.6	34	81.0	
Education					
No formal education	57	21.0	25	59.5	13.351*
Primary	129	47.6	15	35.7	
Secondary	53	19.6	2	4.8	
Tertiary	32	11.8	nil		
Ethnicity					
Malay	79	29.1	20	47.6	11.5503*
Chinese	184	67.9	18	42.9	
Indian	8	2.95	4	9.5	
Marital status					
Single (unmarried)	14	5.2	1	2.4	14.0347**
Married	141	52.0	10	23.8	
Divorced/Windowed	116	42.8	31	73.8	
Place of Residence					
Urban	212	78.2	32	76.1	0.0879.
Rural	59	21.8	10	23.8	The P-Value is 0.766845
Smoking	40	14.8	7	16.7	0.1036.
Non-smoking	231	85.2	35	83.3	The P-Value is 0.747578.
Family	239	88.2	25	59.5	40.8005**
Alone	28	10.3	8	19.0	
Old Folks Home	4	1.5	9	21.4	

*p value < 0.05, ** p < 0.001

Table 3: Results of multivariate binary logistic regression of odds association with dementia

Variable	OR	95% CI Lower Upper
Age (reference group 65-74 years of age) >75	0.146	0.0699 to 0.3048
Female (vs Male)	0.2406	0.1074 to 0.5388
Education (reference group no formal education)		
Primary	3.7719	1.8507 to 7.6874
Secondary	11.6228	2.6245 to 51.4719
Tertiary	13.5965	1.7572 to 105.2067
Ethnicity (reference group: Chinese)		
Malay	0.3864	0.194 to 0.7698
Indian	0.1957	0.0536 to 0.7139
Marital status (reference group :Single)		
Married	1.0071	0.1199 to 8.4557
Divorced/Widowed	0.2673	0.0338 to 2.1122
Urban residence (vs Rural)	0.8906	0.4138 to 1.9167
Smoking (vs non-smoking)	1.155	0.4799 to 2.7796
Surrounding Environment (reference group staying with		

family)		
Alone	0.3661	0.1508 to 0.889
Old folks home	0.0349	0.0089 to 0.1374

Single and married individuals are comparable to get chance dementia, on the other hand divorced and widowed individuals are 3.74 times higher to experience dementia. Those who were smokers were 15 % more likely suffer from dementia than those who did not smoked. We can also conclude that compared to those who were staying with family, individuals who lived alone have 2.7 times higher odds while those from Old folks home have 28 times higher odds of dementia.

Discussion

The overall prevalence rate in this study was noted to be 13.4% which is similar to earlier studies conducted previously[5].It is important to have reliable estimates of the prevalence of dementia as this would enable more accurate provision and planning of optimal care of the elderly[8].

Multivariate analyses showed that advancing age ,female gender, decreased level of education and ethnicity were independent risk factors of dementia. This is similar to the socio-demographic study in older Malaysians[5].By identifying the risk factors of dementia, subjects who are at risk for the development of dementia can be identified and this will provide guidelines for the first line doctors in the primary health care centres on choosing subjects that need cognitive screening. Thus the early detection of dementia with adequate counseling and healthy lifestyles can cut-down costs. The economic cost of dementia has been noted to be higher than that of heart disease and cancer together. It is estimated that more then $350 billion per year is spent on medical and residential care of people with dementia[9].Earlier detection of dementia will also enable earlier treatment[10, 11].

In a study on prevalence of cognitive impairment among the members of NASCOM, it showed that there was no statistically significant association between cognitive impairment and level of education[12],however our study revealed that the lower the level of education the higher the risk of dementia .

A study done by Kua and Ko in Singapore using the two stage method of ECAQ as a screening tool found the prevalence of dementia as 2.5% among Chinese and 4% among Malays[4]. This is similar to another study carried out by *Hamid et al* where there was higher prevalence of dementia among the Malays and Bumiputeras (15 and 32%) as compared to Chinese (6.3%) and Indians(5.8%)[5]. However in another study of older Singaporeans[16] similar ethnic differentials in dementia rates were observed among Malays (1.6%), Chinese (1.2%) and Indians (1.9%) . In this study, the prevalence of dementia was highest among the Indians (33.3%) as compared to Malays (20.2%) and Chinese (8.9%).

The limitation of this study is the use of CDT which was non-conclusive. 43.4% of all respondents could not perform the CDT due to various reasons the commonest being no formal education background .Out of the total cases of dementia 83.3% could not perform the Clock Drawing Test. Several studies have been done to show that in the case of CDT level of education, age and mood influence the test results with subjects of low education, advanced age and depression performing poorly[13-15].Thus CDT has to be combined with other tests to attain the diagnosis of dementia.

Finally ,as there is an increase in the life expectancy, knowledge of dementia at an early stage could improve health outcomes and reduce the burden of suffering of this syndrome.

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