Prevalence Estimation of Dementia Among Thai Elderly : A National Survey

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Abstract

Objective : To determine the prevalence of dementia and its associated factors among Thai elderly.

Design : A one-stage cross-sectional national survey.

Setting : National communities in Thailand.

Subjects : 4,048 elderly subjects aged 60 and above.

Results : There were 668 (16.5%) elderly with a CMT score below 15. Among these elderly, 132 were dependent as to certain aspects of self-care. According to the definition of dementia used in this one-stage survey design (i.e. subjects with a low CMT score and self-care dependence), 3.3 per cent of Thai elderly (95% confidence interval = 2.7-3.8) were classified as having dementia. After adjusting to geographic and municipal area, the prevalence rate was 3.4 per cent (95% confidence interval = 2.8-4). Age-specific prevalence rate increased dramatically from 1.0 per cent in the 60-64 age-group to 31.3 per cent in the 90+ age-group. The prevalence rate of dementia among Thai elderly found in this study did not differ from the prevalence rates among the elderly in other Asian and developed countries. Using a logistic regression analysis, 3 independent factors associated with dementia were age, literacy (writing) and geographic area.

Conclusion : With a one-stage survey design for determining the prevalence of dementia, the prevalence rate and age-specific prevalence rate among the Thai elderly did not differ from those found in other Asian and developed countries.

Key word : Dementia, Thailand, Elderly, Epidemiology, Prevalence

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Dementia is the clinical syndrome characterized by acquired loss of cognitive and emotional abilities severe enough to interfere with daily functioning and the quality of life. It is one of the most common and most disabling, late-life mental disorders[1,2]. As most of the dementia subjects are among the elderly, this syndrome has been well recognised as a problem of old age. Although most older people live in developing countries, little research on dementia has been carried out[3-5]. According to the constituent of Thailand, there is no argument that health and social resources must be provided to these patients appropriately. Hence, the acknowledgment of the size of the problem and associated factors is essential in order to estimate the current context, type and cost of medical and social service provisions, and to make a confident prediction of future requirements. Based on these considerations, the present national study was aimed at determining the prevalence of dementia and its associated factors among the Thai elderly.

Conducting a national survey for determining dementia prevalence using a two-stage (high risk subjects after screening diagnosed by specialists) or three-stage survey (high risk subjects after screening visited by physicians and highly suspected dementia subjects referred to specialists for making a diagnosis) is very costly and not appropriate for developing countries. Moreover, two- and three-stage surveys require experienced physicians and/or specialists (e.g. neurologists, psychiatrists, geriatricians) and thus render these designs not appropriate for a national study in Thailand at present. Therefore, the one-stage survey was designed for dementia prevalence estimation in this national study.

Epidemiologists working in the general community have observed a gradation from normal ageing to severe dementia i.e. 'mild', 'moderate' or 'severe'. These adjectives are used inconsistently from one investigator to another particularly in cases of mild dementia. Varying definitions have led to prevalence estimates ranging from 2.0 to 52.7 per cent[6]. To avoid this problem, we have aimed at determining Thai elderly with moderate to severe dementia based upon the criteria of "having a low mental test score and dependence on selfcare ADLs". Rationale for using this diagnostic criteria is applied from the Clinical Dementia Rating (CDR)[7,8]. The Chula Mental Test (CMT) was used in our study because it is the only impaired cognitive screening test developed for Thai elderly and has been tested with regard to criterion, concurrent and content validity[9-11]. The CMT does not require reading and writing abilities and is suitable for the Thai elderly population whose illiteracy rate is high[3].

SUBJECTS AND METHOD

In 1997, the Ministry of Public Health of Thailand conducted a multi-stage random cross-sectional survey named the National Health Examination Survey II. The sampling frame was obtained from the National Statistical Office, Office of the Prime Minister. The National Statistical Office is responsible for the national census survey every ten years and produces a sampling frame for other national surveys. The sampling frame from the population census survey in 1995-1996 was used. Stratified multi-stage sampling was performed: 1st stage - Five geographic areas of Thailand were located (geographic stratification) including 4 regions (Central, Northern, Northeastern, Southern regions) and Bangkok.; 2nd stage - Eight provinces of each region and 8 districts of Bangkok were then sampled at random.; 3rd stage - villages and communities underwent stratified sampling according to municipal and non-municipal areas except in Bangkok where all communities were municipal areas (67 communities/villages for Bangkok and the northern region, 61 for the central region, 71 for the northeasthern region, and 68 for the southern region).; 4th stage - 15 elderly people aged 60 years and above from each village and community were then sampled at random. Therefore, 1,005 subjects in Bangkok, 915 subjects in the central region, 1,005 subjects in the northern subjects, 1,065 subjects in the northeastern region, and 1,020 subjects in the southern region were sampled (The total number was 5,010). All subjects were visited at their own houses. They and their caretakers or family members were told about the objective of this survey conducted by the Ministry of Public Health. Repeated visits were made as necessary. However, only 4,048 subjects (80.8%) could be contacted and interviewed.

Cognition of all subjects was assessed by trained interviewers applying the Chula Mental Test (CMT)[9]. All subjects were interviewed with respect to dependence on 6 personal care activities of

daily living (ADL) including feeding, grooming, transferring, toileting, dressing and bathing. The modified Barthel ADL Index[12,13] was used for ADL assessment. Dependence on these activities was defined as "need supervision or help". Those elderly with a CMT score of 14 or below who were dependent on any of the 6 personal care activities of daily living were classified as "dementia".

The crude and adjusted prevalence of dementia and their 95 per cent confidence intervals were computed. The prevalence was then adjusted by geographic and municipal area. The impact of socio-economic factors among those with and without dementia was compared and tested for statistical significance by means of the chi-square test. Those associations with a statistical significance attaining a p-value of 0.05 or below were entered into a logistic regression analysis using dementia as the dependent variable. The odds ratio and 95 per cent confidence interval were used to assess the independent contributions of each factor. The SPSS-PC programme was used for statistical analysis.

RESULTS

Out of 4048 elderly, 668 (16.5%) had a CMT score below 15. Among these elderly, 132 were dependent on at least one of six self-care activities. Therefore, 3.3 per cent of the Thai elderly (95% confidence interval = 2.71-3.81) were classi-

Table 1. Characteristics of Thai elderly subjects with and without dementia.

	Demented (n = 132)	Non-demented (n = 3916)	Odds ratios
Mean age in years			
(standard deviation)	77.8 (9.2)	69.4 (7.0)	-
Age group : n (%)*			
60-69	26 (19.7)	2,297 (58.7)	-
70-79	44 (33.3)	1,210 (30.9)	3.2
80+	62 (47.0)	409 (10.4)	13.4
Sex : n (%)**			
Male	38 (28.8)	1,693 (43.2)	-
Female	94 (71.2)	2,223 (56.8)	1.9
Reading ability : n (%)*			
fluent	21 (15.9)	2,008 (51.3)	-
not-fluent	27 (20.5)	845 (21.6)	3.0
illiterate	84 (63.6)	1,063 (27.1)	7.5
Writing ability : n (%)*			
fluent	16 (12.1)	1,740 (44.4)	-
not-fluent	24 (18.2)	1,021 (26.1)	2.6
illiterate	92 (69.7)	1,155 (29.5)	8.7
Adequacy of income : n (%)			
adequate	74 (56.1)	2,139 (54.6)	-
inadequate only in some occasions	28 (21.2)	1,028 (26.3)	-
inadequate	20 (15.1)	571 (14.6)	-
seriously inadequate	10 (7.6)	178 (4.5)	-
Areas of living : n (%)***			
Northern region	17 (12.9)	854 (21.8)	-
Southern region	26 (19.7)	860 (22.0)	1.5
North-eastern region	26 (19.7)	857 (21.9)	1.5
Central region	30 (22.7)	693 (17.7)	2.2
Bangkok	33 (25.0)	652 (16.6)	2.5
Municipal area : n (%)			
Municipal area	65 (49.2)	1,849 (47.2)	-
Non-municipal area	67 (50.8)	2,067 (52.8)	-

* $p < 0.001$
** $p < 0.005$
*** $p < 0.05$

Table 2. Age-specific prevalence rate (%) of dementia among Thai elderly and the elderly in deveoped countries.

Age groups	Preston (9)	Jorm (10)	Ritchie (11)	EURODEM (12,13)	Present study
60-64	-	0.7	-	-	1.0
65-69	1.8	1.4	1.4	1.5	1.2
70-74	3.3	2.8	2.6	3.2	3.5
75-79	6.3	5.6	4.7	6.6	3.5
80-84	11.7	10.5	8.1	11.8	10.1
85-89	22.0	20.8	14.9	20.5	13.0
90+	41.3	38.6	25.7	29.9	31.3

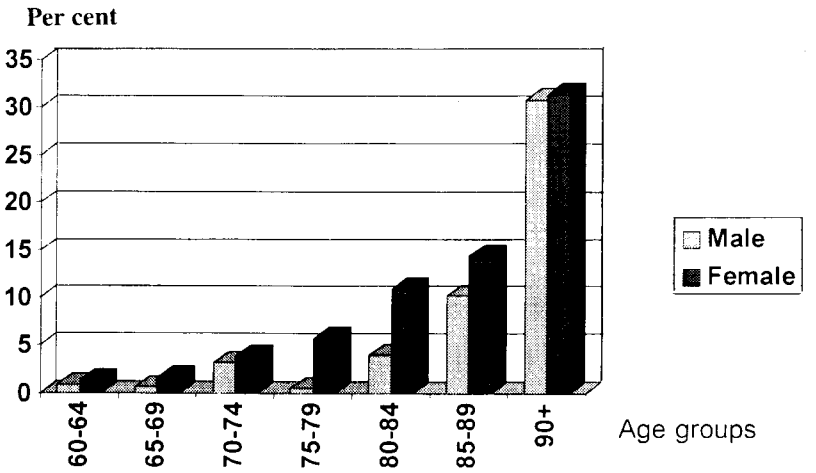

Fig. 1. Age-specific prevalence of dementia among Thai elderly grouped by sex.

fied as "dementia". After adjusting to geographic and municipal area, the prevalence rate was 3.4 per cent (95% confidence interval = 2.85-3.97). The prevalence among Thai elderly aged 65 and above was 4.1 per cent. Their mean age (standard deviation) was 69.7 (7.3) years. Of these, 38 (28.8%) were male. Characteristics of Thai elderly with and without dementia are shown in Table 1. The age-specific prevalence rate increased dramatically from 1.0 per cent in the 60-64 age-group to 31.3 per cent in the 90+ age-group. The age-specific prevalence rates of dementia among Thai elderly are very alike those reported from western countries[14-18]. (Table 2) The prevalence of dementia among female elderly was higher than among their male counterparts in all age groups. (Fig. 1)

Six univariate socio-economic factors of dementia were entered into a logistic regression analysis. Three independent factors associated with dementia were age, literacy (writing) and geographic area. Their odds ratios and 95 per cent confidence intervals are shown in Table 3.

DISCUSSION

This study is the first national study, which aimed to estimate the prevalence of dementia among Thai elderly. Because of limited financial resource, a one-stage survey design was selected. Although use of "a low mental test score plus self-care dependence" as a criteria might give some false positive and negative results, it is arbitrarily used as one of the criteria for estimation of dementia

Table 3. Odds ratios and their 95% confidence interval of independent soci-economic factors of dementia.

	Odds ratio	95% confidence interval
Age group		
60-69	1.0	-
70-79	2.53	1.54 - 4.16
80+	8.19	5.01 - 13.38
Area of living		
Northern region	1.0	-
Southern region	1.71	0.91 - 3.23
North-eastern region	1.92	1.02 - 3.62
Central region	2.71	1.45 - 5.06
Bangkok	3.80	2.05 - 7.06
Writing ability		
Fluent	1.0	-
Not-fluent	2.46	1.29 - 4.68
Illiterate	6.18	3.54 - 10.78

prevalence[7,8]. However, we are highly aware of the limitation of the criteria used in this study. Thus, an extensive review of dementia prevalence studies around the world is conducted and used for comparison with the result of this study.

In 1986-1987 a three-stage survey for dementia was conducted among Thai elderly living in a poor area of Bangkok and a prevalence of 1.8 per cent was found[4]. Because the elderly population living in poor areas in 1986-1987 was young compared to the general elderly population at present and the prevalence of dementia among the elderly population increases rapidly with age, the prevalence of 3.4 per cent found in our study is reasonable and does not differ from that found in the previous three-stage survey. For a population aged 65 and above, the prevalence found in Thai elderly (4.1%) corresponds well with those found in Chinese (2.3%) and Malay (4%) Singaporean [19], Indian (3.2-4%)[20-22], Taiwanese (4.4%) [23], Chinese (4.6%)[24], Korean (9.5%)[25] and Japanese (6.7-7.2%)[26,27]. Moreover, the age-specific prevalence of dementia found in this study is not different from that found among the elderly population in developed countries of Europe and North America[9-13]. (Table 3)

The dementia prevalence rises exponentially with age across all studies including our study, although the rates actually reported varied from study to study[14-18,20-27]. From the logistic regression model, the difference between the sexes was not significant which has also been observed in other studies[15-17,21,28]. Literacy and level of education have been found to be risk factors for dementia as found in our study[15,17,18]. It is possible that associations with literacy and education level arise because of assessment or diagnostic procedures which are socio-culturally biased. However, recent studies have indicated that the relationship between dementia and education is not just an artifact of case detection methods or education bias in the screening tests used[29,30]. These associations may be explained by the brain reserve theory[30, 31]. It is very interesting to find that the geographic area (region) is an independent factor of dementia and supports the findings of a previous study among Thai elderly which found the geographic area to represent a factor but not the principle occupation associated with the Mini-Mental Status Examination score[32]. The effect of the place of residence may represent some hidden factors such as psychosocial and cultural variables which might be considered multiple reacting factors with different protective or predisposing roles for dementia[32,33]. To explain these findings further investigations are required.

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ประมาณการความชุกของกลุ่มอาการสมองเสื่อมในประชากรไทยสูงอายุ : การศึกษาระดับชาติ

สุทธิชัย จิตะพันธ์กุล, พ.บ., วท.ม., ชัยยศ คุณานุสนธิ์, พ.บ., ปร.ด.**, วิพุธ พูลเจริญ, พ.บ., ปร.ด.**, ไพบูลย์ สุริยะวงศ์ไพศาล, พ.บ.****

วัตถุประสงค์ : เพื่อศึกษาความชุกของกลุ่มอาการสมองเสื่อมในประชากรไทยสูงอายุและปัจจัยที่สัมพันธ์

รูปแบบการวิจัย : การสำรวจระดับชาติแบบภาคตัดขวางขั้นตอนเดียว

สถานที่ : ชุมชนทั่วประเทศไทย

ประชากรศึกษา : ผู้สูงอายุที่มีอายุ 60 ปีขึ้นไปจำนวน 4,048 คน

ผลการศึกษา : พบผู้สูงอายุจำนวน 668 คน (ร้อยละ 16.5) ที่มีคะแนนของแบบทดสอบสภาพจิตจุฬาต่ำกว่า 15 คะแนน ในจำนวนนี้พบ 132 คนที่ต้องพึ่งพาในกิจวัตรดูแลตนเอง ความชุกของกลุ่มอาการสมองเสื่อมตามเกณฑ์วินิจฉัยที่กำหนดใช้ในการศึกษาครั้งนี้จึงเท่ากับร้อยละ 3.3 (95% confidence interval = 2.7-3.8) ภายหลังจากการปรับด้วยพื้นที่อยู่อาศัยและเขตการปกครองพบความชุกเท่ากับร้อยละ 3.4 (95% confidence interval = 2.8-4) อัตราความชุกตามกลุ่มอายุเพิ่มขึ้นอย่างรวดเร็วเมื่ออายุเพิ่มขึ้น จากร้อยละ 1 ในกลุ่มอายุ 60-64 ไปเป็นร้อยละ 31.3 ในกลุ่มอายุ 90 ปีขึ้นไป อัตราความชุกของกลุ่มอาการสมองเสื่อมในประชากรไทยสูงอายุจากการศึกษานี้พบว่าไม่แตกต่างจากอัตราความชุกของประชากรสูงอายุในประเทศต่าง ๆ ของทวีปเอเชียและในประเทศที่พัฒนาแล้ว จากการวิเคราะห์ด้วย logistic regression analysis พบปัจจัยอิสระของกลุ่มอาการสมองเสื่อม 3 ชนิดได้แก่ อายุ ความสามารถในการเขียนหนังสือ และพื้นที่อยู่อาศัย (ภาค)

สรุป : จากการศึกษานี้พบว่าอัตราความชุกและอัตราความชุกตามกลุ่มอายุในประชากรไทยสูงอายุไม่แตกต่างจากที่พบในประเทศต่าง ๆ ของทวีปเอเชียและในประเทศที่พัฒนาแล้ว

คำสำคัญ : กลุ่มอาการสมองเสื่อม, ประเทศไทย, ผู้สูงอายุ, ระบาดวิทยา, ความชุก

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