Thai Journal of Obstetrics and Gynaecology
July 2013, Vol. 21, pp. 110-116

GYNAECOLOGY

Prevalence and Risk Factors of Mild Cognitive Impairment in Menopausal Women at HRH Princess Maha Chakri Sirindhorn Medical Center

Thanupat Deetong-on MD*,
Pawin Puapornpong MD*,
Somphoch Pumipichet MD*,
Songpoom Benyakorn MD**,
Maethaphan Kitporntheranunt MD*,
Kittipong Kongsomboon MD PhD ***.

*Department of Obstetrics and Gynecology, Faculty of Medicine, Srinakharinwirot University, Thailand
**Department of Psychiatry, Faculty of Medicine, Srinakharinwirot University, Thailand
***Department of Preventive and Social Medicine, Faculty of Medicine, Srinakharinwirot University, Thailand

ABSTRACT

Objective: To assess the prevalence and risk factors associated with mild cognitive impairment (MCI) in Thai menopausal women.

Materials and Methods: The eligible menopausal women were asked during a face-to-face interview to participate in the Thai Montreal Cognitive Assessment (Thai MoCA) test at HRH Princess Maha Chakri Sirindhorn Medical Center. Cognitive impairment was defined as a test's score of 24 or less. Univariate and multivariate analyses were performed to determine the variable associated with positive Thai MoCA test.

Results: The authors found that 20 of the 120 participants were cognitively impaired. The significant associated risk factors were low education (adjusted odd ratio: 3.7; p= 0.03) and the number of concomitant medical diseases. The adjusted odd ratios for one, two and three diseases were 18.0, 42.1 and 88.9 respectively.

Conclusion: The prevalence of MCI in menopausal women was 16.7 %. Early detection of this problem in vulnerable group will benefit to their cognitive performance.

Keywords: prevalence, mild cognitive impairment, menopause, HRH Princess Maha Chakri Sirindhorn Medical Center

Introduction

In the past decade, elders are rapidly increased in Thai population and Thailand becomes an aging society[1]. As life expectancy of women are longer and a quarter of her life-time are in menopause, which may need special care[2]. Menopause is determined by permanent cessation of menses[3]. At this age, the body systems undergo numerous changes, one of which includes the alteration of the cognitive ability and memory[4].

Psychological well-being is an important factor of successful aging[5]. Cognitive function is the key domain of functional ability of menopausal women. Cognitive impairment is a wide spectrum of degenerative disease which manifests as the deterioration of the central neurological functions in several key domains such as attention, memory, psychomotor speed, and cognitive decline[6]. Mild cognitive impairment (MCI) is a transitional state between normal cognitive functioning and dementia[7]. There are many diagnostic tools to test cognitive function objectively[8]. Most of the tests determined MCI when test score is lower than 2 standard deviations (SD) of the mean score achieved by general population[6].

Evidence from previous data showed that the prevalence of MCI was range from 2–56 % depending on the classification system, diagnostic tool, study group and sample size in the studies[9]. The worst case of cognitive impairment is dementia which has immense impact on daily living, cost and continuing care of patients[8].

MCI in menopausal women is a silent public-health problem that has not been study thoroughly. The magnitude of disease and its consequences remain unknown. The lack of clinical data in Thai menopausal women is the motivation of our study.

The purpose of the study is to identify the prevalence and risk factors of MCI in menopausal women in order to early detect pre-dementia stage and providing health care support in high risk group.

Materials and Methods

This study was a descriptive cross-sectional study to examine the cognitive function of menopausal women at HRH Princess Maha Chakri Sirindhorn Medical Center. The trial was conducted from July 2012 to November 2012. All participants were asked to complete their consent forms. The study protocol was approved by the ethical review board of Faculty of Medicine, Srinakarinwirot University (SWUEC-EX142/2555).

Inclusion and exclusion criteria

Data were collected by purposive sampling acquired from menopausal women that visited the gynecologic out-patient clinic. The inclusion criteria were women with normal consciousness and who gave consent to participate in the study.

Exclusion criteria were surgical menopause, history of psychiatric illness, history of organic brain disease (e.g. seizure, stroke or brain abscess), patients with apparent cognitive impairment and patients that could not communicate in Thai.

Cognitive assessment

The Thai Montreal Cognitive Assessment (MoCA) test was used for cognitive function testing by physicians and registered nurses. All interviewers were trained and standardized for using Thai MoCA questionnaire by an experienced psychiatrist (SB). The total score is 30 points which comprised of 7 domains namely as followings; visiospatial/executive, naming, attention, language, abstraction, delayed recall memory and orientation. If participant's education was grade 6 of primary school level or lower, then 1 point was added to their scores. The cut-off point score of 24 or less was used to conclude that they were MCI[10].

Statistical analysis

After data collection in pilot study, the sample size was calculated based on 80% of power and 0.05 error. This study required at least 120 participants.

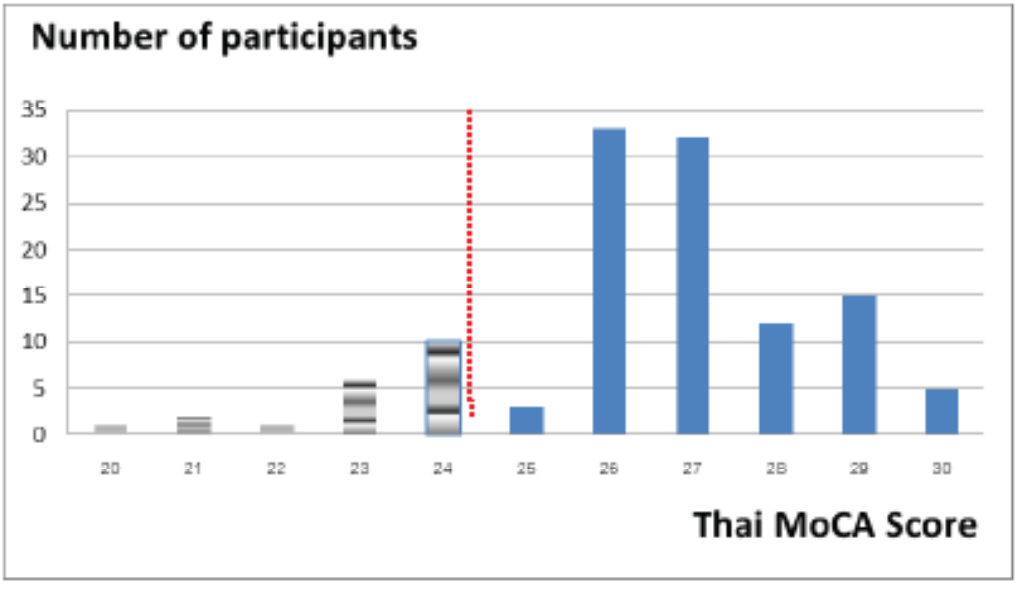
Continuous data were presented as mean and standard deviation (SD). The student t-test was used to compare the continuous variables where appropriate. Categorical data were presented as a frequency or percentage. Variables those p-values less than 0.2 in the univariate analyses were administered into a logistic regression model to reveal any independent risk factors of MCI. A two sided p-value of less than 0.05 was considered as statistically significant.

Results

A total of 120 eligible participants were interviewed face-to-face and all of them completed Thai MoCA test in a single visit. From all participants, twenty of them (16.7 percent) had positive test for Thai MoCA test. The frequency of test scores and number of participants was presented in Fig. 1.

Patients' characteristics and associated risk factors were compared between MCI and non-MCI group. The mean age was 65.9 and 61.9 years old, respectively. Majority of MCI patients were overweight, couple marital status, average income and graduated in primary and tertiary levels. Most of them had menopause during 45-55 years old and only ten percent had used hormone replacement therapy. Eighty percent have one or two concomitant medical diseases such as hypertension, diabetes or dyslipidemia. This study showed the significant difference of MCI in menopausal women who graduated from primary school level ($p = 0.19$) and increasing number of medical diseases ($p < 0.01$).

By multivariate logistic regression analysis, menopausal women with primary education level (adjusted OR 3.7, 95%CI of 1.1-12.1), one underlying disease (adjusted OR 18.0, 95%CI of 2.1-151.9), two underlying diseases (adjusted OR 42.2, 95%CI of 4.6-388.4) and three underlying diseases (adjusted OR 88.9, 95%CI of 2.8-2864.6) had a significant increase risk of MCI compare with non-MCI group (Table 2). Lower education level and higher number of medical diseases were the independent prognostic factors of MCI in this study.



Cut off score for a positive test was 24 or less

Fig 1. Frequency chart of Thai Montreal Cognitive Assessment scores of participants.

Table 1. Characteristics of mild cognitive impairment group and normal group.

Characteristics	MCI (n=20)	Non-MCI (n=100)	p
Age			
Mean age (years) ± SD	65.90 ± 9.70	61.90 ± 10.10	0.11*
Body mass index (percent)			0.43**
Underweight	0	1	
Normal weight	40	58	
Overweight	50	36	
Obesity	10	5	
Current marital status (percent)			0.79**
Single	30	33	
Couple	70	67	
Income per month (baht)			0.25*
Mean ± SD	20050 ± 3680	26474 ± 4020	
Education (percent)			0.19**
Primary	40	21	
Secondary	20	28	
Tertiary	40	51	
Smoker (percent)	15	12	0.71**
Alcohol user (percent)	40	26	0.21**
Caffeine intake (percent)	20	30	0.63**
Amount of concomitant diseases (percent)			<0.01**
0	5	47	
1	25	37	
2	55	14	
3	15	2	
Menopause at age 45-55 yearsold (percent)	90	85	0.71**
Previous hormone replacement therapy (percent)	10	12	0.71**

MCI: mild cognitive impairment

BMI: body mass index

underweight = BMI<18.5 kg/m^2

normal weight = BMI 18.5 and <25 kg/m^2

overweight = BMI 25 and <30 kg/m^2

obesity = BMI >30 kg/m^2

*Independent student t test

**Chi-square test

Table 2. Adjusted odds ratio for various associated risk factors in menopausal women with mild cognitive impairment by logistic regression

Variables		Adjust OR*	95% CI	p
Education				
	Tertiary	1.00		
	Primary	3.67	1.12 - 12.07	0.03
Amount of concomitant diseases				
	None	1.00		
	One disease	18.03	2.14 - 151.94	< 0.01
	Two diseases	42.16	4.58 - 388.45	< 0.01
	Three diseases	88.94	2.76 - 2864.62	0.01

OR: odds ratio

*Odds ratio adjusted by age, education and amount of concomitant diseases

Discussion

The prevalence of MCI in this study (16.7%) is similar to that of previous reports (15.8-25.6%)[11, 12]. However, it cannot compared to other report due to different setting of study populations, varying inclusion criteria, varying clinical endpoint and screening tools[8]. Menopause is the state of estrogen deprivation that may affect cognitive function through several mechanisms[4]. Although several benefits of estrogen have been discovered but in some studies had showed that hormonal therapy did not prevent MCI and increased health risk of dementia in women age 65 or older[13, 14].

There are many commonly used tools for cognitive function tests such as the Six Item Cognitive Impairment Test[15], the Mini-Mental State Examination or the Subjective Memory Rating Scale[16]. The Thai MoCA test was used in this study which is an excellent screening tool for MCI and high sensitivity (80%) and specificity (80%) at cut-off score of 24[10].

The significant risks of MCI in this study were graduating primary school and numbers of concomitant medical diseases. The possible correlation of MCI and low level of education is the lack of experience to cope with different or complicating situations when compared to those with higher education. This finding consistent with Yaffe K, et al[17] who found that high school level or greater had more ability to read/write than 9th grade level cause the different of cognition.

The recent study found that the more numbers of medical diseases, the more chance to develop MCI. This corresponds with Lu FP, et al[18] and Ritchie K, et al[19] those diabetic patients are more likely to suffer from MCI by 1.47 and 4.88 times, respectively. Peila R, et al[20] found that each year of antihypertensive treatment could significantly decrease cognitive impairment by 0.94 times. Anstey KJ, et al[21] determined that high serum cholesterol patients have a significantly higher risk of developing dementia than those with normal level in middle-aged group.

Contrary to other studies[22], there is no significant association between prior history of hormone replacement therapy, alcohol drinking, caffeine intake and smoking with the development of MCI or dementia. The magnitude and pattern of MCI is important because of the prospect that early intervention might delay progression to dementia. Some modifiable risk factors could be dealt with and given a continual care for them[19].

The limitations of this study was a hospital-based data that might not represent the overall prevalence rate of MCI, did not explore each affected domains of Thai MoCA test, did not specify the type of medical diseases and did not classify sub-type of MCI. These variables

may have affected the prevalence of MCI which can progress to dementia.

Further studies are needed to classify MCI subgroups and estimation the rate of conversion of MCI to dementia in Thai menopause women.

Conclusion

The prevalence of MCI in menopause screened using Thai MoCA test was 16.7%. The associated risk factors were numbers of concomitant diseases and low education level. Effective identification of MCI allows early treatment to improve quality of life of these patients.

References

1. Sasat S, Bowers BJ. Spotlight Thailand. The Gerontologist [serial on the Internet]. 2013: Available from: http://gerontologist.oxfordjournals.org/content/early/2013/05/14/geront.gnt038.abstract.
2. Laskar AR. Women's health: beyond reproductive years. Indian J Public Health. 2011 Oct-Dec;55:247-51.
3. Jan L. Shifren, Isaac Schiff. Menopause. In: Jonathan S. Berek, E. Norvak, editors. Berek & Novak's Gynecology. 15th ed. Philadelphia: Wolters Kluwer : Lippincott Williams & Wilkins; 2012. p. 1233-48.
4. Soares CN, Maki PM. Menopausal transition, mood, and cognition: an integrated view to close the gaps. Menopause. 2010 Jul;17:812-4.
5. Ingersoll-Dayton B, Saengtienchai C, Kespichayawattana J, Aungsuroch Y. Measuring psychological well-being: insights from Thai elders. Gerontologist. 2004 Oct;44:596-604.
6. Mikdashi JA, Esdaile JM, Alarcon GS, Crofford L, Fessler BJ, Shanberg L, et al. Proposed response criteria for neurocognitive impairment in systemic lupus erythematosus clinical trials. Lupus. 2007;16:418-25.
7. Petersen RC, Negash S. Mild cognitive impairment: an overview. CNS Spectr. 2008 Jan;13:45-53.
8. Busse A, Bischkopf J, Riedel-Heller SG, Angermeyer MC. Mild cognitive impairment: prevalence and incidence according to different diagnostic criteria. Results of the Leipzig Longitudinal Study of the Aged (LEILA75+). Br J Psychiatry. 2003 May;182:449-54.
9. Bischkopf J, Busse A, Angermeyer MC. Mild cognitive impairment--a review of prevalence, incidence and outcome according to current approaches. Acta Psychiatr Scand. 2002 Dec;106:403-14.
10. Tangwongchai S, Phanasathit M, Charernboon T, Akkayagorn L, Hemrungrojn S, Phanthumchinda K, et al. The validity of Thai version of the Montreal Cognitive Assessment (MoCA-T). Dement Neuropsychol. 2009;3(2):172.
11. Snitz BE, Saxton J, Lopez OL, Ives DG, Dunn LO, Rapp SR, et al. Identifying mild cognitive impairment at baseline in the Ginkgo Evaluation of Memory (GEM) study. Aging Ment Health. 2009 Mar;13:171-82.
12. Lee LK, Shahar S, Rajab N. Serum folate concentration, cognitive impairment, and DNA damage among elderly individuals in Malaysia. Nutr Res. 2009 May;29:327-34.
13. Shumaker SA, Legault C, Rapp SR, Thal L, Wallace RB, Ockene JK, et al. Estrogen plus progestin and the incidence of dementia and mild cognitive impairment in postmenopausal women: the Women's Health Initiative Memory Study: a randomized controlled trial. JAMA. 2003 May 28;289:2651-62.
14. Henderson VW. Menopause, cognitive ageing and dementia: practice implications. Menopause Int. 2009 Mar;15:41-4.
15. Upadhyaya AK, Rajagopal M, Gale TM. The Six Item Cognitive Impairment Test (6-CIT) as a screening test for dementia: comparison with Mini-Mental State Examination (MMSE). Curr Aging Sci. 2010 Jul;3:138-42.
16. Ramlall S, Chipps J, Bhigjee AI, Pillay BJ. The sensitivity and specificity of subjective memory complaints and the subjective memory rating scale, deterioration cognitive observee, mini-mental state examination, six-item screener and clock drawing test in dementia screening. Dement Geriatr Cogn Disord. 2013;36:119-35.
17. Yaffe K, Fiocco AJ, Lindquist K, Vittinghoff E, Simonsick EM, Newman AB, et al. Predictors of maintaining cognitive function in older adults: the Health ABC study. Neurology. 2009 Jun 9;72:2029-35.
18. Lu FP, Lin KP, Kuo HK. Diabetes and the risk of multi-system aging phenotypes: a systematic review and meta-analysis. PLoS One. 2009;4:e4144.
19. Ritchie K, Carriere I, Ritchie CW, Berr C, Artero S, Ancelin ML. Designing prevention programmes to reduce incidence of dementia: prospective cohort study of modifiable risk factors. BMJ. 2010;341:c3885.
20. Peila R, White LR, Masaki K, Petrovitch H, Launer LJ. Reducing the risk of dementia: efficacy of long-term treatment of hypertension. Stroke. 2006 May;37:1165-70.
21. Anstey KJ, Lipnicki DM, Low LF. Cholesterol as a risk factor for dementia and cognitive decline: a systematic review of prospective studies with meta-analysis. Am J Geriatr Psychiatry. 2008 May;16:343-54.
22. Etgen T, Sander D, Bickel H, Forstl H. Mild cognitive impairment and dementia: the importance of modifiable risk factors. Dtsch Arztebl Int. 2011 Nov;108:743-50.

ความชุกและปัจจัยเสี่ยงที่เกี่ยวข้องในสตรีวัยหมดประจำเดือนที่มีภาวะ Mild Cognitive Impairment ในศูนย์การแพทย์สมเด็จพระเทพรัตนราชสุดา ฯ สยามบรมราชกุมารี

ธนุพัชร์ ดีทองอ่อน, ภาวิน พัวพรพงษ์, สมโภช ภูมิพิเชฐ, ทรงภูมิ เบญญากร, เมธาพันธ์ กิจพรธีรานันท์, กิตติพงษ์ คงสมบูรณ์

วัตถุประสงค์ *: เพื่อศึกษาความชุกและปัจจัยที่เกี่ยวข้องกับภาวะ Mild Cognitive Impairment ในสตรีไทยวัยหมดประจำเดือน*

วิธีการวิจัย *: สตรีวัยหมดประจำเดือนที่มารับบริการแผนกผู้ป่วยนอกนรีเวชที่โรงพยาบาลศูนย์การแพทย์สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารีที่มีคุณสมบัติเข้าได้กับเกณฑ์การคัดเลือกประชากรจะทำการตอบแบบสอบถามซึ่งใช้ประเมินภาวะ Mild Cognitive Impairment [Thai Montreal Cognitive Assessment] โดยกำหนดเกณฑ์ที่จะวินิจฉัยภาวะ Mild Cognitive Impairment ที่คะแนนแบบทดสอบน้อยกว่าหรือเท่ากับ 24 คะแนน ปัจจัยที่เกี่ยวข้องกับภาวะ Mild Cognitive Impairment จะถูกนำมาวิเคราะห์ความถดถอยเอกนามและพหุนาม*

ผลการวิจัย *: พบสตรีวัยหมดประจำเดือนที่มีภาวะ Mild Cognitive Impairment จำนวน 20 คน จากทั้งหมด 120 คน ปัจจัยที่เกี่ยวข้องกับภาวะ Mild Cognitive Impairment ได้แก่ ระดับการศึกษาในชั้นประถมศึกษา [Adjusted odd ratio : 3.7, p-value = 0.03] และจำนวนโรคประจำตัวของสตรีวัยหมดประจำเดือน โดยมีค่า Adjusted odd ratio สำหรับ หนึ่ง สอง และสามโรคเท่ากับ 18.0 , 42.1, 88.9 ตามลำดับ*

สรุป *: ความชุกของสตรีวัยหมดประจำเดือนที่มีภาวะ Mild Cognitive Impairment เท่ากับ 16.7 % การตรวจพบตั้งแต่เริ่มต้นในกลุ่มเสี่ยงจะเป็นประโยชน์ต่อการให้การดูแลรักษาต่อไป*