Prevalence of Neuropsychiatric Symptoms in Alzheimer's Disease: A Cross-Sectional Descriptive Study in Thailand

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Objective: *To estimate the prevalence of neuropsychiatric symptoms in Thai patients with Alzheimer's disease.*
Material and Method: *The present study is a cross-sectional descriptive design. The participants comprised 62 patients from the Memory Clinic at Thammasat University Hospital, Thailand. Subjects were diagnosed as having Alzheimer's disease according to the National Institute of Neurological and Communicative Disorders and Stroke and Alzheimer's disease and Related Disorders Association (NINCDS-ADRDA) criteria and received global Clinical Dementia Rating scale (CDR) score of at least stage 1. All participants were assessed using the Neuropsychiatric Inventory Questionnaire (NPI) and the Thai Mental State Examination (TMSE).*
Results: *The subjects were female 62.9% and male 37.1%, the mean age was 76±6.7 years. The majority of them (62.9%) were in the mild stage (CDR = 1). The result showed that the prevalence of neuropsychiatric symptoms (≥1 symptom) reported was 100%. The most common symptoms were apathy (71%), aberrant motor behavior (61.3%), sleep problems (56.5%), eating problems (51.6%) and agitation/aggression (45.2%), whereas the least was euphoria (6.5%). The number of neuropsychiatric symptoms increased with severity of the disease. The result also showed that 61.3% of the participants presented with the chief complaint of neuropsychiatric symptoms, whereas memory complaints were only 38.7%.*
Conclusion: *Neuropsychiatric symptoms are very common in Thai Alzheimer's disease patients. Therefore, management of Alzheimer's patients should include an assessment of neuropsychiatric symptoms and also concentrate on reducing these symptoms. The number of neuropsychiatric symptoms increases with disease progression. Moreover, neuropsychiatric symptoms were the most common presenting problem rather than memory problem in Thai patients with Alzheimer's disease.*

Keywords: *Prevalence, Dementia, Alzheimer's disease, Behavioral symptom, Neuropsychiatric symptom*

J Med Assoc Thai 2014; 97 (5): 560-5
Full text. e-Journal: *http://www.jmatonline.com*

Besides memory and cognitive decline, neuropsychiatric symptoms or behavioral and psychological symptoms of dementia (BPSD) are commonly found in people with Alzheimer's disease. Both clinically based and epidemiological studies found that 75-95% of Alzheimer's disease patients experienced at least one symptom of any severity over the course of the disease[1-3]. These neuropsychiatric symptoms were significantly related to poor disease prognosis, patient well being and caregiver distress[4,5]. Therefore, appropriate detection and management of these symptoms are very important. However, research regarding neuropsychiatric symptoms of Alzheimer's disease in Thailand are extremely limited. The objective of the present study was to estimate the prevalence of neuropsychiatric symptoms in Thai Alzheimer's disease patients.

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Material and Method

The participants of the study comprised 62 outpatients at the Memory Clinic, Thammasat University Hospital, Thailand between June 2010 and May 2011. They were recruited on a voluntary basis. The diagnosis of Alzheimer's disease was made according to NINCDS-ADRDA criteria (the National Institute of Neurological and Communicative Disorders and Stroke and Alzheimer's disease and Related Disorders Association) by psychiatrists at the Memory Clinic, and all participants received a global Clinical Dementia Rating (CDR)[6] of at least stage one. All participants were also assessed using the Thai-Mental State Examination (TMSE)[7] and the Neuropsychiatric Inventory (NPI)[8]-administered by trained psychiatrists.

The present study was approved by the Ethical Committee for Human Research of the

Faculty of Medicine, Thammasat University (Ref: MTU-PS-2-CR053-053/53). An informed consent was obtained from the participants/caregivers.

Measures

Demographic data included gender, age in years, years of completed education, and presenting problem (chief compliant).

The NPI was developed by Cummings et al[8] and is administered to caregivers of dementia patients. Its scale assesses twelve domains of neuropsychiatric symptoms: delusions, hallucinations, agitation, depression/dysphoria, anxiety, euphoria/elation, apathy/indifference, disinhibition, irritability/lability, aberrant motor activity, sleep problems and appetite/eating change. In each domain, the NPI also rates the frequency (four-point scale), severity (three-point scale) and the distress of caregivers (five-point scale) in each symptom.

The TMSE is a Thai version of the Mini Mental State Examination (MMSE)[9], which has been translated and culturally modified for Thai patients. The total score of the TMSE ranges from 0 to 30 points. The mean total score of TMSE in the normal Thai elderly population was 27.38 (SD = 2.02)[7]. The cut-off point for the normal healthy Thai elderly population is over 23.

The Clinical Dementia Rating (CDR) was developed by Hughes et al[6] for the evaluation of dementia severity. Six domains are assessed: memory, orientation, judgment and problem-solving, community affairs, home and hobbies, and personal care. The Clinical Dementia Rating is a 5-point scale: CDR-0 = no cognitive impairment, CDR-0.5 = very mild dementia/mild cognitive impairment, CDR-1 = mild dementia, CDR-2 = moderate dementia and CDR-3 = severe dementia[9,10].

Data were analyzed using SPSS 16.0 (SPSS Inc., Chicago, IL, USA 2007). Categorical measures were summarized using frequencies and percentages. Continuous measures were described by means and standard deviations. The associations were analyzed by independent t-test, Spearman's correlation, and ANOVA. All tests were performed at a significance level of 0.05.

Results

Patient characteristics

There were 62 subjects: 23 males (37.1%) and 39 females (62.9%). The patients' ages varied from 50 to 89 years (mean = 76, SD = 6.7 years), and the TMSE scores ranged from 4 to 27 (mean = 18.3, SD = 5.9). According to the global CDR score, most patients were classified as mild severity (62.9%), 30.6% as moderate and 6.5% as severe (Table 1).

Prevalence of neuropsychiatric symptoms

Fig. 1 shows the prevalence of neuropsychiatric symptoms of 12 subscales from the NPI. The most common neuropsychiatric problems were apathy (71.0%), aberrant motor behavior (61.3%), sleep problems (56.5%) and eating problems (51.6%) respectively, whereas the lowest prevalence was euphoria (6.5%).

All of the patients had at least one neuropsychiatric symptom, 95.2% had been suffering from two or more neuropsychiatric symptoms and 88.7% had been suffering from three or more neuropsychiatric symptoms (Table 2). The mean number of neuropsychiatric symptoms was 5.1 (SD = 2.3).

Table 1. Patients characteristics

Characteristic	No. (%)
Gender	
Male	23.0 (37.1)
Female	39.0 (62.9)
Age, mean (SD), years	76.0 (6.7)
Education, mean (SD), years	6.8 (5.0)
TMSE, mean (SD)	18.3 (5.9)
Global CDR	
CDR-1 (mild)	39.0 (62.9)
CDR-2 (moderate)	19.0 (30.6)
CDR-3 (severe)	4.0 (6.5)

TMSE = Thai-Mental State Examination; CDR = clinical dementia rating

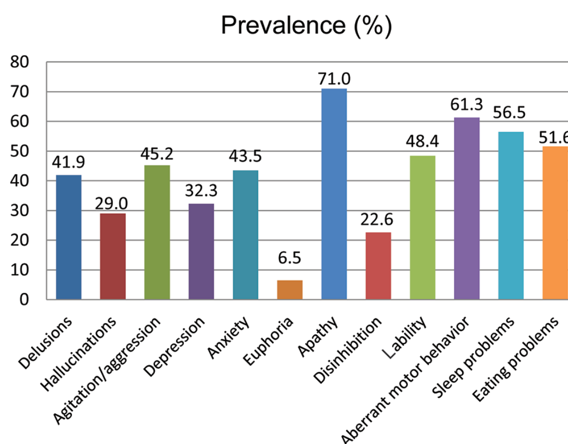

Fig. 1 Prevalence of neuropsychiatric symptoms.

Relationship of number of neuropsychiatric symptoms to demographic data and severity

The number of neuropsychiatric symptoms had no relationship to gender (male: mean (SD) = 5.04 (2.22), female = 5.12 (2.39), t = -1.38, p = 0.89) and age (Spearman's correlation = -0.146, p = 0.257). The number of neuropsychiatric symptoms had an inverse relationship with the total TMSE score (Spearman's correlation = -0.406, p = 0.002).

The mean number of neuropsychiatric symptoms was 4.26 (SD = 1.87) for the mild dementia group, 6.37 (2.20) for the moderate, and 7.25 (2.75) for the severe, and it was statistically significant (F = 9.08, p<0.001). Post-hoc analyses were performed; the mean number of the mild dementia group differed from the moderate and the severe group (Scheffe, p = 0.002 and 0.027 respectively), whereas the moderate group was not significantly different from the severe group (Scheffe, p = 0.740).

Frequency of reported presenting symptoms

The most common presenting symptoms (chief complaint) in this study were neuropsychiatric symptoms (61.3%), whereas memory problems (forgetfulness) were a presenting symptom for only 38.7%. Agitation/aggression was the most prevalent neuropsychiatric symptoms. The details of the presenting symptoms were described in Table 3.

Table 2. Frequency distribution of number of individual neuropsychiatric symptoms

Number of neuropsychiatric symptoms	Patients with Alzheimer's disease, No. (%)
0	0 (0)
1	3 (4.8)
2	4 (6.5)
3	8 (12.9)
4	11 (17.8)
5	15 (24.2)
6	7 (11.3)
7	3 (4.8)
8	3 (4.8)
9	5 (8.1)
10	3 (4.8)

Table 3. Results showing frequency of reported chief complaint

Symptoms	No. (%)
Memory problems	24 (38.7)
Neuropsychiatric symptoms	38 (61.3)
Agitation/aggression	14 (22.6)
Depression	9 (14.5)
Sleep problems	7 (11.3)
Psychosis	7 (11.3)
Others	1 (1.6)

Discussion

The results of the present study show that neuropsychiatric symptoms are extremely common in Thai Alzheimer's disease with 100% overall prevalence. All patients had at least one neuropsychiatric symptom at the time of assessment. This is comparable to the published prevalence data in a similar population, with a similar methodology. For example, the prevalence in Fuh et al[11] was 95% and in Camozza et al[12] was 97.2%.

The most prevalent neuropsychiatric symptom in the present study was apathy (71%), as was previously reported in many other studies[3,13-15]. Aberrant motor behavior (61.3%), sleep problems (56.5%), eating problems (51.6%), irritability (48.4%) and agitation/aggression (45.2%) were the next most frequently reported neuropsychiatric symptoms in this study. Euphoria/elation (6.5%) was the least common, as evident in other studies[3,8,11,13].

According to the former studies that used the NPI as a measure in Alzheimer's disease, in the UK[14] the most common neuropsychiatric symptoms were apathy (88%), aberrant motor behavior (70%), agitation/aggression (66%), eating problems (60%) and sleep problems (54%). In Canada[16], they were apathy (67%), aberrant motor behavior (53%), depression (52%) and anxiety (49%). In Taiwan[11], aberrant motor behavior (57%), anxiety (54%), delusion (47%), agitation/aggression (45%) and apathy (44%) were reported. Euphoria was the least frequently reported behavior in all three studies, as well as in the present study.

Although the percentages and the orders of neuropsychiatric symptoms recorded were slightly different among the four different countries. The commonly found neuropsychiatric symptoms, for example apathy, aberrant motor behavior, sleep problems and agitation/aggression were always present. These findings suggest that some neuropsychiatric symptoms are mainly due to the neuropathology of Alzheimer's disease itself, more than psychological or environmental factors.

In the present research, we have found that the number of neuropsychiatric symptoms increased with the disease severity. This is in accordance with many other studies that also report the prevalence of neuropsychiatric symptoms in Alzheimer's disease increasing with disease progression[3,11,17].

Because of the high prevalence of apathy, agitation/aggression, aberrant motor behavior and sleeping problems, these symptoms are usually bothersome and reported to aggravate caregiver's distress[4,5]. Therefore, it is necessary for health professionals to assess carefully, monitor for these symptoms and provide proper management.

We also found that the most common presenting symptoms were neuropsychiatric symptoms (61%), whereas memory complaints (forgetfulness) were only 38%. This finding may reflect that the majority of Thais still lack knowledge about Alzheimer's disease. They believe that 'forgetfulness' is normal in elderly people; consequently, many Alzheimer's disease patients who have only memory problem do not seek medical treatment. Caregivers usually take patients to hospital when they have more severe neuropsychiatric symptoms such as aggression, depression and sleep problems because these symptoms are poorly tolerated.

The present study may have implications for future studies. Using a higher sample size would further clarify the prevalence of neuropsychiatric symptoms in Thai Alzheimer's disease patients. This would also provide a better template for comparison with international studies. In addition, a prospective follow-up of the patients would benefit geriatric health professionals understanding of the natural course of neuropsychiatric symptoms in Alzheimer's disease patients.

Limitation

The population was recruited from the Memory Clinic setting, which might have introduced a selection bias. A review by Assal[18] suggests that the prevalence of neuropsychiatric symptoms in a hospital-based study is usually higher than in a population-based study. Furthermore, there were only 62 participants in the present study, and only four of them were in the severe stage; therefore, we could not group the subjects into the three levels of severity.

Conclusion

Neuropsychiatric symptoms are very common in Thai Alzheimer's disease patients. Therefore, management of Alzheimer's patients should include an assessment of neuropsychiatric symptoms and also concentrate on reducing these symptoms. The number of neuropsychiatric symptoms increases with disease progression. Moreover, neuropsychiatric symptoms were the most common presenting problem rather than memory problem in Thailand.

What is already known on this topic?

Both clinically based and epidemiological studies found that 75-95% of Alzheimer's disease patients experienced at least one symptom of any severity over the course of the disease.

What this study adds?

Neuropsychiatric symptoms are also very common in Thai Alzheimer's disease patients with 100% overall prevalence.

The most prevalent symptoms were apathy, aberrant motor behavior, sleep problems, eating problems, irritability and agitation/aggression.

Neuropsychiatric symptoms were the most common presenting problem rather than memory problem in Thailand.

Contributors

Charernboon T designed the study, collected the data, analyzed the data and wrote the manuscript. Phanasathit M designed the study and collected the data. All authors have approved the final manuscript.

Acknowledgement

The present study was supported by grants of Thammasat University (No. 16/2553). We are very grateful for the support and help of Dr. Tawanchai Jirapramukpitak and all staff at the Memory Clinic, Thammasat University Hospital, Thailand.

Potential conflicts of interest

None.

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ความชุกของอาการประสาทจิตเวชในโรคอัลไซเมอร์: การศึกษาเชิงพรรณนาแบบตัดขวางในประเทศไทย

ธรรมนาถ เจริญบุญ, มุทิตา พนาสถิตย์

วัตถุประสงค์: *เพื่อศึกษาความชุกของ neuropsychiatric symptoms ในผู้ป่วยอัลไซเมอร์ไทย*

วัสดุและวิธีการ: *การศึกษาภาคตัดขวางเชิงพรรณนา กลุ่มตัวอย่างได้แก่ ผู้ป่วยโรคอัลไซเมอร์ในคลินิกโรคสมองเสื่อม โรงพยาบาลธรรมศาสตร์เฉลิมพระเกียรติ จำนวน 62 ราย วินิจฉัยโดยใช้เกณฑ์ NINCDS/ADRDA criteria และมีคะแนน global Clinical Dementia Rating Scale (CDR) มากกว่าหรือเท่ากับ 1 คะแนน กลุ่มตัวอย่างถูกประเมินด้วย Neuropsychiatric Inventory (NPI) และ Thai Mental State Examination (TMSE)*

ผลการศึกษา: *กลุ่มตัวอย่างเป็นเพศหญิงร้อยละ 62.9 เพศชายร้อยละ 37.1 อายุเฉลี่ยเท่ากับ 76±6.7 ปี ส่วนใหญ่ร้อยละ 62.9 มีความรุนแรงของโรคสมองเสื่อมอยู่ในระดับน้อย (mild, global CDR = 1) พบความชุกของ neuropsychiatric symptoms อย่างน้อย 1 อาการ เท่ากับร้อยละ 100 โดยอาการที่พบมากที่สุดได้แก่ apathy (ร้อยละ 71) ตามด้วย aberrant motor behavior (ร้อยละ 61.3) sleep (ร้อยละ 56.5) eating (ร้อยละ 51.6) และ agitation/aggression (ร้อยละ 45.2) ส่วนอาการที่พบน้อยที่สุดได้แก่ euphoria พบร้อยละ 6.5 โดยพบว่าจำนวนของ neuropsychiatric symptoms เพิ่มขึ้นตามระดับความรุนแรงของโรค นอกจากนี้ยังพบว่าอาการหลักที่ทำให้ญาติพากลุ่มตัวอย่างมาพบแพทย์เป็นอาการด้านพฤติกรรมและอารมณ์ ร้อยละ 61.3 ในขณะที่อาการหลงลืมพบเพียง ร้อยละ 38.7*

สรุป: *Neurospychiatric symptoms พบได้สูงมากในผู้ป่วยอัลไซเมอร์ไทย ดังนั้นการดูแลรักษาผู้ป่วยกลุ่มนี้จึงจำเป็นต้องมีการประเมินและรักษาปัญหา neuropsychiatric symptoms ร่วมด้วยเสมอโดยจำนวนของ neuropsychiatric symptoms เพิ่มขึ้นตามการดำเนินของโรค นอกจากนี้ในประเทศไทย neuropsychiatric symptoms ยังเป็นอาการสำคัญที่นำให้ญาติพาผู้ป่วยมาพบแพทย์มากกว่าปัญหาเรื่องความจำ*