Baylor Profound Mental Status Examination in Thai Cohort

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Abstract

Background: Practical instrument to assess patients with severe dementia is an important issue in the memory clinic. Mini-Mental State Examination has a floor effect when evaluating severe dementia.

Objectives: We explored the relationship between Baylor Profound Mental Status Examination cognitive part (BPMSE-cog), and the Severe Impairment Battery (SIB), Clinical Dementia Rating (CDR), and Thai version of Mini-Mental State Examination (TMSE) in 75 severe dementia patients.

Methods: We reviewed our experience in assessing dementia patients in Thai dementia cohort in the memory clinic at Siriraj Hospital in Bangkok, Thailand. Spearman correlation was used to look at the relationship among the measures. P value of <0.05 was regarded as statistically significant (*).

Results: Twenty-two men and 53 women with severe dementia from the memory clinic at Siriraj Hospital were recruited in this study. Mean age of this cohort was 76.8(9.4) year old. The mean (SD) of the BPMSE-cog, SIB, TMSE, and CDR sum of the boxes were 17.1(5.5), 56.3 (20.2), 8.17 (6.3), and 8.4 (2.9) consecutively. Pearson correlation coefficient between BPMSE-cog and SIB, CDR-sb, TMSE were 0.489*, -0.58*, and 0.603* accordingly.

Conclusion: The BPMSE-cogcould evaluate Thai cohort with severe dementia. It had good correlation with other severe dementia measures. We suggested to use the BPMSE-cog in the clinical practice to evaluate moderate and severe dementia in Thai persons.

Keywords: severe dementia, Baylor Profound Mental Status Examination, Thai

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The ageing population in low- and middle-income countries, including Thailand, is increased as the life expectancy is increasing.[1]A larger number of the aging population will present with a severe dementia disorder. At these stages of dementia, traditional neuropsychological tests have limited value because of floor effectexecution.

Lately, cognitive tests for moderate-to-severe dementia patientshave amplified in number, showing clinicalusefulness. The following tests are commonly used measures for assessment of cognitive functionin severe dementia: Severe Impairment Battery (SIB)[2], Severe Cognitive Impairment Rating Scale (SCIRS)[3], Mattis Dementia Rating Scale (DRS)[4], Test forSevere Impairment (TSI)[5], Hierarchic Dementia Scale[6], Modified Ordinal Scales of Psychological Development(M-OSPD)[7], Severe Impairment Rating Scale (SIRS)[8], Severe CognitiveImpairment Profile (SCIP)[9], and Baylor Profound Mental State Examination (BPMSE).[10] These tests are different in administration time, response modality, challenge, and rating methods. However, the administration time of tests for severe dementia should be short, and the tests should not have floor effects.

Baylor Profound Mental State Examination (BPMSE) consists of 3 parts, firstly the cognitive assessment, secondly the behavior assessment, and thirdly the assessment of global impressions of communicative skills and social interaction. BPMSE had satisfactory reliability validity in Alzheimer' s disease dementia patients.

Objectives: The aim of this study is to explore the utility of the cognitive part of the BPMSE (BPMSE-cog) in Thai elderly with dementia, not exclusively Alzheimer' s disease.

Materials and Methods: BPMSE cognitive part was translated into Thai and back translated into English (VS, NP). Seventy-five individuals with memory complaints from the memory clinic at Siriraj Hospital were recruited to explore the utility of BPMSE. Dementia was diagnosed by DSM IV TR.[11]Other dementia assessment in this study were Thai Mental State Examination (TMSE)[12], Clinical Dementia Rating (CDR)[13,14], and Thai Activities of Daily Living Scale (Thai ADL)[15] which divided into 6 basic ADL measures and 7 instrumental ADL measures. Thai ADL scores and CDR scores were scored as the higher scores the worse performance the subjects had. Five individuals with dementia from the memory clinic at Siriraj Hospital were assessed with interrater and test-retest reliability of BPMSE. SPSS 18, intraclass correlation, Pearson correlation, and ANOVA test were utilized in this study. P value<0.05 was regarded as statistical significance. This study has been approved under the study of the memory clinic at Siriraj Hospital by Institute Review Board of Faculty of Medicine Siriraj Hospital, Mahidol University.

Results: Twenty-two men and 53 women with severe dementia from the memory clinic at Siriraj Hospital were recruited in this study. Mean age of this cohort was 76.8(9.4) year old. The mean (SD) of the BPMSE-cog, SIB, TMSE, and CDR sum of the boxes were 17.1(5.5), 56.3 (20.2), 8.17 (6.3), and 8.4 (2.9) consecutively.Pearson correlation coefficient between BPMSE-cog and SIB, CDR-sb, TMSE were 0.489*, -0.58*, and 0.603* accordingly.

Table 1 Subject characteristics of 75 persons from the memory clinic at Siriraj Hospital: mean and standard deviation (S.D.)

N=75	Mean	S.D.	Median	Minimum	Maximum
Age (years)	76.8	9.4	78	53	93
TMSE total	8.17	6.3	7	0	30
BPMSE-cog total	17.1	5.5	18	0	25
CDR total (n=71)	8.4	2.9	8	0.5	16
BADL total (n=64)	5.6	4.2	6	0	12
IADL total (n=64)	10.8	3.8	13	0	14
Thai ADL sum total (n=64)	16.6	7.1	15.5	0	26
SIB-total (n=63)	56.3	20.2	59	0	94

TMSE= Thai Mental State Examination, BPMSE=Baylor Profound Mental State Examination, Thai ADL= Thai Activity of Daily Living Scale which divided into 6 basic ADL measures and 7 instrumental ADL measures, CDR= Clinical Dementia Rating, SIB= Severe Impairment Battery.

Table 2 Correlation between BPMSE-cog and other measures

N=75	Correlation coefficients (r)	P value (two-tailed)
BPMSE-cog total * TMSE total	0.603	<0.001**
BPMSE-cog total * SIB total	0.489	<0.001**
BPMSE-cog total * BADL total	-0.393	0.001**
BPMSE-cog total * IADL total	-0.395	0.001*
BPMSE-cog total * ADL total	-0.444	<0.001**
BPMSE-cog total * CDR total	-0.58	<0.001**

Correlation coefficient by Pearson correlation

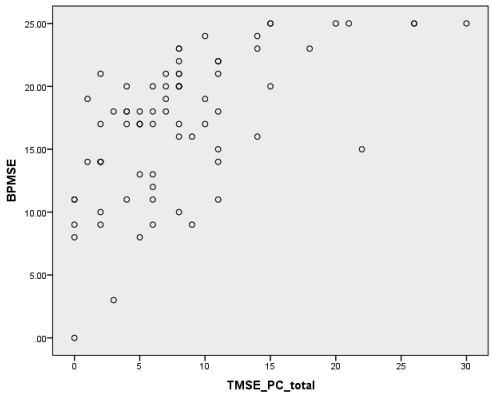
r= 0.30 a weak linear relationship, r= 0.50a moderate relationship, r= 0.70a strong linear relationship

BPMSE= Baylor Profound Mental State Examination, TMSE= Thai Mental State Examination,Thai ADL= Thai Activity of Daily Living Scale, CDR= Clinical Dementia Rating, SIB= Severe Impairment Battery.

** $P < 0.01$

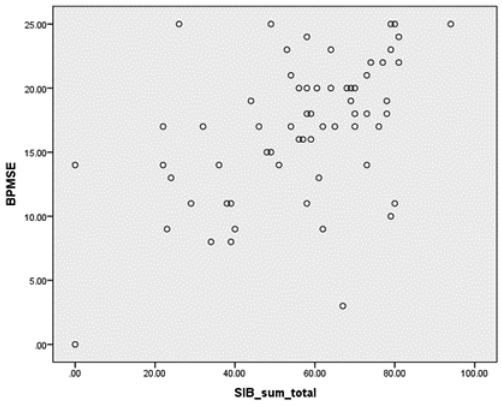
Figure 1 Scatter plot between the BPMSE-cog and TMSE, SIB, Thai ADL, CDR

1.1 BPMSE-cog total correlation with TMSE total



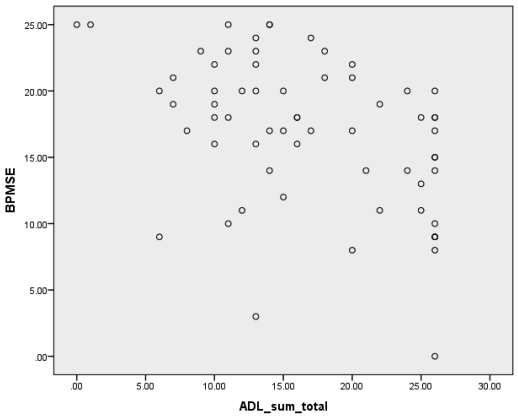
r=0.603 p=<0.001

1.2 BPMSE-cog total correlation with SIB total



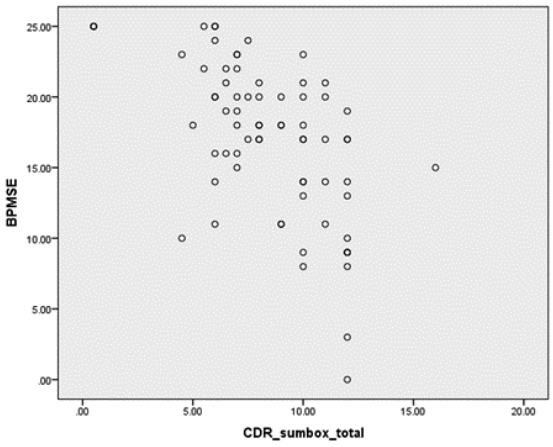
r=0.489 p=<0.001

1.3 BPMSE-cog total correlation with Thai ADL total



r=-0.444 p=<0.001

1.4 BPMSE-cog total correlation with CDR sum of the box(sb)



r=-0.58 p=<0.001

BPMSE= Baylor Profound Mental State Examination, TMSE= Thai Mental State Examination,Thai ADL= Thai Activity of Daily Living Scale, CDR= Clinical Dementia Rating, SIB= Severe Impairment Battery.

Table 3 showed statistical significance of BPMSE-cog scores in mild, moderate and severe dementia. Table 4 revealed significant inter-rater and test-retest reliability results.

Table 3 Significant difference BPMSE-cog scores in mild, moderate, and severe dementia[14]

	BPMSE-cog Mean± S.D.	P-value
TMSE sum total		
TMSE <14 score	16.12(5.12)	<0.001
TMSE 15-20 score	23.6(2.2)	
TMSE 21-26 score	23(4.4)	
CDR sum of the Box(sb)		
Questionable cognitive impair (CDR sb0.5-2.5)	25(0)	
Mild dementia (CDR sb 4.5-9)	18.9(4)	<0.001
Moderate to severe dementia (CDR sb 9.5-18)	13.8(4.2)	

BPMSE= Baylor Profound Mental State Examination, TMSE= Thai Mental State Examination, CDR= Clinical Dementia Rating

Table 4 BPMSE-cog inter-rater and test-retest reliability

	INTER-RATER RELIABILITY PEARSON CORRELATION	TEST-RETEST RELIABILITY ICC(95%CI)
BPMSE-COG	0.099 (p<0.001)	0.929(-0.010,0.992)

All values are p < 0.05. BPMSE= Baylor Profound Mental Status Examination Thai version; ICC, Intraclass correlation coefficient; CI, confidence interval.

Our study revealed ceiling and floor effectsof the BPMSE cognitive assessments in dementia. The highest TMSE score in our sample was 30 points. In this patient, BPMSE scores was 25. Among those with BPMSE-cog scores of 25, their TMSE scores were between 15-30. The lowest TMSE score (0 points) was detected in 4 patients.In these subjects, BPMSE-cogscores ranged from0 to 11, and the lowest score wasreached.

The reliability test of BPMSE-cog was performed on 6 individuals, 4 male and 2 female, whom their mean TMSE was 6.17(sd=5.88). The mean BPMSE-cog scores of the test and retest (an hour after the first test) were 12.83(7.96) and 15.83(8.28). The intraclass correlation coefficient for test retest reliability was 0.929 (95%CI-0.010,0.992).The mean BPMSE-cog of rater1 was 15.83(8.28)and that of rater2 was 16(8.44). The inter raters' Pearson correlation coefficient was 0.99($p<0.001$). These results were highly acceptable for the total scale, both in inter-rater and test-retest reliabilities. (Table 4).

Discussion

We demonstrated that the concurrent validity of the BPMSE-cog was acceptable and the reliability test of the BPMSE-cog was high. The good correlations were seen between the BPMSE-cog and the TMSE and the CDR. While the Thai ADL scale and the SIB had somewhat weakly to moderately acceptable correlation to the BPMSE-cog.

Spanish version[16] of the BPMSE-cog and Danish version[17] of the BPMSE-cog also demonstrated high validity and reliability of the BPMSE-cog in their populations. They concluded that the BPMSE-cog was stable and was a strong scale for the cognitive assessment of patients with severe dementia. Danish study revealed that there was no floor effect of the BPMSE on cognitive function in their study.

The BPMSE-cog seems well designed to capture the group of participants scoring very low on the Mini Mental State Examination(MMSE) and the global scales. Thus, there seems to be no measurable floor effect, as the BPMSE-cog continues to differentiate in scores among those participants with MMSE score below 6 and to zero.

The BPMSE-cog is easy to administer with a minimum requirement of accessories to use. In our study, we recruited dementia of various causes not just Alzheimer disease dementia. Despite the heterogeneity of the subjects, a good reliability and validity have been demonstrated.

The limitations of this study were that number of participants was modest and external and internal validity should have been used. We suggested further studies of the BPMSE on various settings in severe dementia and use of the BPMSE as outcome measure. Inconclusive, the BPMSE-cog is a strong scale and is recommended as a scale measuring cognitive severity of dementia disorders in the moderate to severe stages.

Conclusion

The BPMSE-cogcould evaluate Thai cohort with severe dementia. It had good correlation with other severe dementia measures. We suggested to use the BPMSE-cog in the clinical practice to evaluate moderate and severe dementia in Thai persons.

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