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A new simple score (ABS) for assessing behavioral and psychological symptoms of dementia

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ABSTRACT

In addition to cognitive impairment, behavioral and psychological symptoms of dementia (BPSD) are another important aspect of most dementia patients. This study was designed for a new simple assessment of BPSD. We first employed a clinical survey for the local community with sending an inquiry letter to all members (n = 129) of dementia caregiver society, and then attempted to create a new BPSD score for dementia with 10 BPSD items. This new simple BPSD score was compared to a standard-detailed BPSD score neuropsychiatric inventory (NPI) for a possible correlation (n = 792) and a time to complete (n = 136). Inter-rater reliability was examined comparing scores between main and second caregivers (n = 70) for AD. Based on the clinical survey for local caregivers, a new BPSD score for dementia (ABS, Abe's BPSD score) was newly created, in which each BPSD item was allotted by an already-weighted score (maximum 1–9) based on the frequency and severity, and was finalized with taking temporal occurrences into account. ABS was filled by the main caregiver with a full score of 44, was well correlated with NPI ($r = 0.716$, $^{**}p < 0.01$) in 792 AD patients (age 78.6 ± 7.0 years, MMSE 19.0 ± 5.9), and took a shorter time as only 56.8 ± 38.8 s ($^{**}p < 0.01$) than NPI score (132.7 ± 94.0 s) with 136 AD patients. A high inter-rater reliability was obtained ($r = 0.964$, $^{**}p < 0.01$) with a little smaller score (0.877 time) of ABS in secondary than the main caregivers. ABS provides a new simple and quick test for BPSD assessment, with a good correlation to NPI but a shorter time, and with a high inter-rater reliability. Thus ABS is useful for evaluating BPSD for mild to moderate dementia patients.

1. Introduction

Dementia is an emerging problem not only in developed countries but also in many developing countries including Asia [1]. Alzheimer's disease (AD) occupies more than 60% of dementia in the developed countries, followed by mild cognitive impairment (MCI), vascular dementia (VaD), dementia with Lewy bodies (DLB), fronto-temporal lobar dementia (FTLD), and other types of dementia. Dementia mainly consisted of 2 neuropsychological problems, namely cognitive impairment (CI) and affective-behavioral change. The latter is currently called behavioral and psychological symptoms of dementia (BPSD).

There are a number of clinical scores to measure CI and BPSD for dementia patients. Among them, mini-mental state examination (MMSE) and Hasegawa Dementia Score-Revised (HDS-R) are common for screening general cognitive function [2,3]. As for BPSD, behavioral pathology in AD (Behave-AD) was proposed at year 1987 [4], Crichton Geriatric Behavioral Rating Scale (CGBRS) at year 1989 [5,6], Dementia Behavior Disturbance Scale (DBDS) at year 1990 [7], neuropsychiatric inventory (NPI) at year 1994 [8], and Troublesome Behavior Scale (TBS) at year 1994 [9]. Although these previous BPSD scores are well established, all of them were designed for detailed examination and thus usually take time.

Because the numbers of dementia patients are quickly increasing in the world, there is a strong need to evaluate BPSD as a quick test in daily neurological/psychiatric or even general medicine clinics. However, there has not been such a simple BPSD score for dementia patients.

Abbreviations: ABS, Abe's BPSD score; AD, Alzheimer's disease; ADAS-Cog, Alzheimer's Disease Assessment Scale—Cognitive Section; Behave-AD, behavioral pathology in AD; BPSD, behavioral and psychological symptoms of dementia; CDR, Clinical Dementia Rating Scale; CGBRS, Crichton Geriatric Behavioral Rating Scale; ChEI, choline esterase inhibitor; CI, cognitive impairment; DBDS, Dementia Behavior Disturbance Scale; DLB, dementia with Lewy bodies; FAB, frontal assessment battery; FTLD, fronto-temporal lobar dementia; GDS, Geriatric Depression Scale; HDS-R, Hasegawa Dementia Score—Revised; M, months; mixD, mixed type of dementia; MMSE, mini-mental state examination; MoCA, Montreal cognitive assessment; NPI, neuropsychiatric inventory; SD, standard deviation; TBS, Troublesome Behavior Scale; VaD, vascular dementia; WAIS-R, Wechsler Adult Intelligence Scale—Revised; WMS, Wechsler Memory Scale.

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Therefore, we have conducted a clinical survey in a local dementia community, created a new simple BPSD score based on the survey results, examined this new BPSD score for dementia patients in comparison to NPI, and compared inter-rater reliability between main and secondary caregivers.

2. Surveys and methods

We first employed a clinical survey for the local community with sending an inquiry letter to all members (n = 129) of the dementia caregiver society in the Okayama Prefecture of Japan. The inquiry form consisted of 10 items of main BPSD, namely, 1) wandering in/outside home, 2) eating or toilet problem, 3) delusion or hallucination, 4) offensive and abusive words, 5) day-night reversal, 6) excitation and agitation, 7) apathy and indifference, 8) depressive and gloomy mood, 9) violent force, and 10) high irritability. In the inquiry, the caregiver can choose any of 10 items if it is found in their patients for frequency, and can choose up to 3 items as the most severe and troublesome BPSD for severity.

Based on their returning inquiries, we analyzed the frequency and severity of the 10 BPSD items in the dementia patients. We plotted each BPSD item on a coordinate field according to the frequency and severity, and gave them already-weighted scores ranging 1–9 as maximum depending on the location of the coordinate field that was divided into 9 subfields. Based on these initial scores, we gave a final grading score for each BPSD item depending on the temporal occurrence of the symptom ranging 0–9, and thus created a new BPSD score sheet.

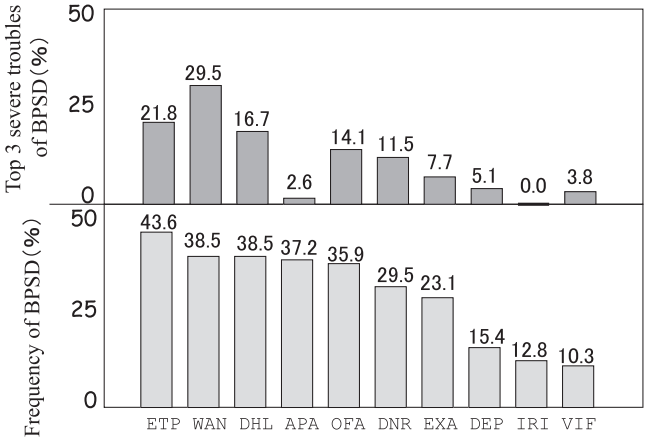
In order to examine a possible relationship between this new BPSD score and a well established BPSD score NPI, both scores were simultaneously examined in 792 AD patients (age 78.6 ± 7.0 years old, MMSE 19.0 ± 5.9, mean ± SD) in our dementia clinics. A part of the AD patients (n = 136) were also examined for the time to complete both this new BPSD score and NPI. To assess the inter-rater reliability, this new BPSD score was newly obtained from pair caregivers (main and secondary caregivers) of 70 AD patients, and compared the scores for a possible difference. Furthermore, MMSE was also examined for a possible relationship between this new BPSD score (891 AD patients plus MCI subjects)/NPI (464 AD patients plus MCI subjects) and a standard screening cognitive score MMSE.

Correlation analysis was performed by non-parametric Wilcoxon Rank Sum test, and the data are expressed as mean ± SD. Data with $p < 0.05$ were considered to be significant. The present study was approved by the Ethical Committee of Graduate School of Medicine, Dentistry and Pharmaceutical Science, Okayama University (#694).

3. Results

Our first inquiry survey collected 81 answers out of totally 129 letters to main caregivers, showing 62.8% of returning rate. In the 81 answers, the dementia patients receiving care were 81.6 ± 9.9 (mean ± SD) years old in average (female rate 70.5%), and 50.0% of them were being cared at home, 29.5% at nursing home or hospital, and 14.5% at both (shuttling home and nursing home/hospital). The main caregivers for the patients were 65.2 ± 11.5 years old in average (female rate 75.6%), who were consisted of 14.8% in husband, 24.4% in wife, 9.0% in son, 25.6% in daughter, 7.7% in daughter-in-law, 3.8% in grandchild, and 14.7% in others. Dementia patients consisted of 77% in AD, 8% in VaD, 5% in DLB, 5% in FTLD, and 5% in mixed dementia (mixD) with an average disease duration of 5 years.

As shown in Fig. 1, a frequency in each BPSD item was 43.6% of eating or toilet problem, 38.5% of wandering in/outside home, 38.5% of delusion or hallucination, and so on (Fig. 1, bottom). On the other hand, the most severe and troublesome BPSD items showed a different pattern, such as 29.5% of wandering in/outside home, 21.8% of eating or toilet problem, 16.7% of delusion or hallucination, and so on (Fig. 1, top).



(Abbreviations: ETP, eating or toilet problem; WAN, wandering in/outside home; DHL, delusion or hallucination; APA, apathy and indifference; OFA, offensive and abusive words; DNR, day-night reversal; EXA, excitation and agitation; DEP, depressive and gloomy mood; IRI, high irritability; VIF, violent force.)

Fig. 1. Frequency (bottom) and severity (top) symptoms of 10 BPSD items obtained from inquiry survey of 81 caregivers for dementia patients. Note the dissociation between the frequency and severity, especially in wandering in/outside home, apathy and indifference, and high irritability.

When the frequency and severity were plotted on a coordinate field according to their data, 7 items showed a slight correlation between the frequency and severity, while 3 items (irritability, apathy, and wandering) did not show such a trend of correlation (Fig. 2). After plotting these 10 BPSD items on the coordinate field, we divided the field into 9 small subfields and gave them initial scores ranging 1–9 as maximum based on the frequency and severity (Fig. 2). After giving these initial scores, we took temporal occurrences such as seldom (practically once a year or less), occasionally (practically once a month or so), sometimes (practically once a week or so), and often (practically once a day or more) into account as another important factor which affects the final scoring. Thus we gave final scores to each BPSD item ranging 0–9, and finally created a new BPSD score with ranging 0–44 from no BPSD (score 0) to full BPSD (score 44) (Table 1).

Simultaneous examinations of this ABS and NPI for the main caregivers of 792 AD patients in our dementia clinics showed a good correlation between the ABS and NPI scores (Fig. 3) with a correlation coefficient of $r = 0.716$ ($^{**}p < 0.01$). There were almost no dementia patients showing the NPI score of more than 80 in our dementia clinics

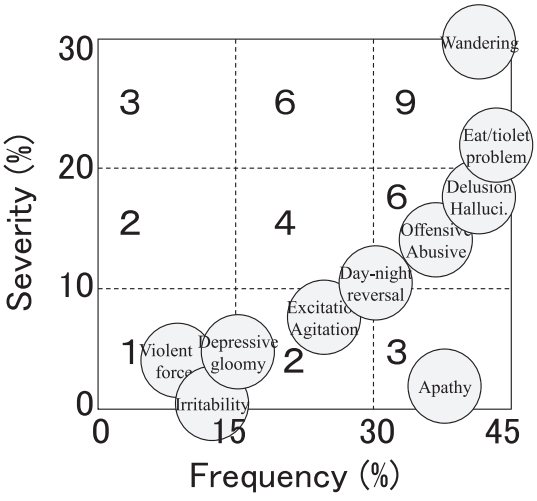


Fig. 2. Plotting 10 BPSD items in the coordinate field depending on their frequency and severity, and 9 subfields of the coordinate were allotted ranging 1–9 as maximum.