

Study of Behavioral and Psychological Symptoms of Dementia in Taiwan

Jong-Ling Fuh

Abstract- The behavioral and psychological symptoms of dementia (BPSD) are common serious problems that affect the quality of life for both the patients with such symptoms as well as their caregivers. BPSD present a major challenge in the medical management of patients and are the major cause of institutionalization. Alzheimer's Disease (AD) is the most common type of dementia in Taiwan. I performed a systematic literature review on BPSD studies and found that Taiwanese patients with AD exhibit many of the BPSD. Studies showed that between 30% and 63% of Taiwan's AD patients experienced delusion. Hallucination occurred less frequently, which ranged from 21% to 26%. Anxiety occurred in 35-76% of patients and depression 22-50%, sleep abnormalities 26-61% and 39-46%. The differences in the prevalence of BPSD might result from the different clinical settings and evaluation instruments. The prevalence and clinical manifestations of BPSD in Taiwan are similar to Western reports and it suggests that most of BPSD are neurobiologically determined. Based on differing cultural backgrounds, the interpretation of agitation and apathy might differ, so, the development of cross-cultural applicable criteria and rating scales for the assessment and treatment of BPSD are important for future studies.

Key Words: Dementia, Neuropsychiatric disturbance, Behavioral and psychological symptoms of dementia, Alzheimer's disease

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INTRODUCTION

In his original case report, Dr. Alois Alzheimer described symptoms of memory loss, delusions, paranoia, hallucinations, verbal outbursts, and disorientation in a 51-year-old woman⁽¹⁾. The behavioral symptoms of dementia present a major challenge in the management of patients. They also increase the caregiver's burden and are the major cause of institutionalization⁽²⁾.

Nevertheless, until recently, these symptoms received less attention than the cognitive symptoms of dementia.

Various terminologies have been developed for these symptoms; terms such as noncognitive symptoms⁽³⁾, behavioral disturbance⁽⁴⁾ and neuropsychiatric symptoms⁽⁵⁾ have been used. The expression "behavioral and psychological symptoms of dementia (BPSD)" was coined to refer to "a heterogeneous range of psychological reactions, psychiatric symptoms, and behaviors

From the Neurological Institute, Veterans General Hospital-Taipei and National Yang-Ming University Schools of Medicine, Taipei, Taiwan.

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Reprint requests and correspondence to: Jong-Ling Fuh, MD. The Neurological Institute, Veterans General Hospital-Taipei, Taiwan, No. 201, Sec. 2, Shih-Pai Road, Taipei, Taiwan.
E-mail: jlfuh@vghtpe.gov.tw

occurring in people with dementia of any etiology” and had been increasingly used in recent years⁽⁶⁾. It’s important to emphasize and distinguish that BPSDs include both psychological and behavioral symptoms. The psychological symptoms are usually and mainly assessed on the basis of interviews with patients and caregivers and include delusions, paranoia, hallucinations, anxiety and a depressed mood. The behavioral symptoms are usually identified on the basis of observation of the patient, and they include such behaviors as physical aggression, screaming, restless, agitation, wandering, culturally inappropriate behaviors, sexual disinhibition and hoarding⁽⁶⁾.

Several epidemiological studies have shown that the prevalence of dementia in Taiwan is between 1.7% and 4.4% in subjects ≥ 65 years of age⁽⁷⁻¹²⁾. Since Taiwan is a rapidly aging society, dementia has become a major public health problem.

In an attempt to synthesize a complete picture of recent medical literature on BPSD, we reviewed published studies related to BPSD in the Taiwanese. The method and results of our literature review are elaborated in the following sections.

SEARCH METHOD

We performed a systemic review of published med-

ical literature between January 1990 and November 2005 through the PubMed and Chinese Electronic Periodicals Service databases with the terms: “psychosis”, “behavioral”, “delusion”, “hallucination”, “agitation”, “depression”, “BPSD”, “Alzheimer’s disease”, “dementia” and “Taiwan”. Manual cross-referencing of bibliographies from all papers and reviews was also done. Since most of the studies were conducted in patients with Alzheimer’s disease (AD) and AD is the most common type of dementia in Taiwan⁽⁷⁻¹²⁾, only the studies reporting data on BPSD in patients with AD were selected. Using these methods, we identified 23 articles⁽¹³⁻³⁵⁾ and retrieved the full text of these publications and reviewed each article in detail.

RESULTS

Subject characteristics, study design and setting

Among the 23 selected articles, six large-scaled studies which surveyed the full spectrum of BPSD in patients with AD were identified⁽¹³⁻¹⁸⁾. Of those, five selected papers were from 3 groups-the Geriatric Psychiatry section of the Psychiatry Department in Taipei Veterans General Hospital (Taipei-VGH)^(13,14); the Neurological Institute of Taipei-VGH and Psychiatry Department of Chang Gung Memorial Hospital⁽¹⁵⁾; and, lastly, the Neurological Institute of Taipei-VGH and

Table 1. Summary of the subjects’ characteristics, study designs and settings in 5 large-scaled BPSD studies in Taiwan

References	13, 14	15	16, 17, 18
Case numbers	54-75	141	86-320
Mean age (years)	73.9-74.3	72.7	73.1-75.2
Female gender (%)	33%-43%	68%	46-55%
Mean Education (years)	6.5-7.3	7.9	6.5-10.5
MMSE score	9.5-10.4	-	12.7-17.1
Tools	Semi structured interview and BEHAVE-AD	SCID, BEHAVE-AD	NPI
Setting	Psychiatric inpatients	Neurology outpatients	Neurology outpatients
Study years	1989-1994; 1989-1996	1996-1997	1999, 2000, 2004
AD diagnostic criteria	DSM-III-R and NINCDS-ADRDA	DSM-III-R and NINCDS-ADRDA	DSM-IV

MMSE: Mini-Mental State Examination⁽³⁶⁾; SCID: structure clinical interview for DSM-III-R⁽³⁷⁾; BEHAVE-AD: Behavioral Pathology in Alzheimer’s Disease rating Scale⁽³⁸⁾; NPI: Neuropsychiatric Inventory⁽³⁹⁾; AD: Alzheimer’s disease; DSM-III-R: Diagnostic and Statistical Manual, 3rd edition, revised⁽⁴⁰⁾; NINCDS-ADRDA: National Institute of Neurologic, Communicative Disorders and Stroke-AD and Related Disorders Association⁽⁴¹⁾; DSM-IV: Diagnostic and Statistical Manual, 4th edition⁽⁴²⁾.

Neurology Department of Kaohsiung Medical University⁽¹⁶⁻¹⁸⁾. Table 1 shows the summary of subject characteristics, study designs and settings in these large-scaled surveys of BPSD. Since the same group used the same methodology and the studied subjects might overlap, we summarized the results according to the study group.

MEASUREMENT

Alzheimer's Disease Rating Scale (BEHAVE-AD)⁽³⁸⁾

Two groups used Behavioral Pathology in Alzheimer's Disease Rating Scale (BEHAVE-AD)⁽³⁸⁾ as a major study tool. The BEHAVE-AD is a 25-item scale that measures behavioral symptoms in seven clusters (paranoid and delusional ideation; hallucinations; activity symptoms; aggressiveness; diurnal rhythm symptoms; affective symptoms; and anxieties and phobias) scored on a four-point scale of increasing severity⁽³⁸⁾.

Neuropsychiatric Inventory (NPI)⁽³⁹⁾

One group used the Neuropsychiatric Inventory (NPI)⁽³⁹⁾ to study BPSD. NPI was rated by the caregivers. A screening question assayed each sub-area of the NPI-delusions, hallucinations, agitation, apathy, anxiety, depression, euphoria, irritability, disinhibition, aberrant motor behavior, change in appetite, and night-time behavior disturbances. If the answer to the screening question was no, then no further questions were asked. If the answer was yes, then subquestions were asked and ratings on the frequency and severity of the behavior were made by the caregiver on the basis of scales with anchor points (Frequency: 1-occasionally, 2-often, 3-frequently, 4-very frequently; Severity: 1-mild, 2-moderate, 3-severe). A global score for the NPI was generated by summing the total scores of the individual subscales.

Revised Memory and Behavior Problem Checklist (RMBPC)⁽⁴³⁾

Only one article⁽³⁴⁾ used the Revised Memory and Behavior Problem Checklist (RMBPC)⁽⁴³⁾ to assess BPSD. The RMBPC is a 24-item form completed by caregivers. It measures the observable memory and

behavioral problems (memory-related, depression, and disruptive behaviors) in dementia patients and caregiver reactions to these problems. The reaction score was calculated only for caregivers of patients manifesting the behavior. Frequency represents the rate of occurrence of individual behaviors (0=none, 1=not in the past week, 2=1-2 times/past week, 3=3-6 times/past week, 4=daily) and reaction represents the degree to which individual behaviors "bother or upset" the caregiver (0=none, 1=a little, 2=moderate, 3=very much, 4=extreme).

The prevalence of BPSD in Taiwan

Table 2 summarizes the prevalence of common BPSD in the published literature from Taiwan. Based Cohen-Mansfield and Billing, agitation was defined as: "inappropriate verbal, vocal, or motor activity that is not judged by an outside observer to result directly from the needs or confusion of the person"⁽⁴³⁾. It was divided into four subtypes, including physically non-aggressive (general restlessness, repetitive mannerisms, pacing, trying to get to a different place, handling things inappropriately, hiding things, inappropriate dressing or undressing, repetitive sentences), physically aggressive (hitting, pushing, scratching, grabbing things and/or people), verbally non-aggressive (negativism, does not like anything, constant requests for attention, verbal bossiness, complaining or whining, relevant or irrelevant interruptions) and verbally aggressive behaviors (screaming, cursing, temper outbursts, making strange noises, kicking and biting)⁽⁴⁴⁾.

Hereafter, the prevalence of other distinctive features of BPSD is presented

Subtypes of delusion

Five articles addressed subtypes of delusion^(13,15,25,26,29). The prevalence of theft delusion was 27%-56%, persecutory delusion 24%-28%, infidelity delusion 3%-17% and abandonment delusion 2%-9%.

Misidentification

Four papers described misidentification^(13,15,20,31) and the prevalence of misidentification was 39%. Phantom

Table 2. Summary of the prevalence of the behavioral and psychological symptoms of dementia in patients with Alzheimer's disease in Taiwan from papers published from 1990-2005

Symptom	Author, year	Case no.	Method	Prevalence (%)
Depression	Liu, 1999 ⁽¹⁹⁾	141	SCID	Major depression 5% Dsythymia 8% Depressive disorder NOS 4%
	Liu, 1999 ⁽¹⁵⁾	103	BEHAVE-AD	22%
	Fuh, 1999 ⁽³⁴⁾	76	RMBPC	50%
	Fuh, 2001 ⁽¹⁶⁾	95	NPI	38%
	Chow, 2002 ⁽¹⁷⁾	230	NPI	49% (Taipei), 44% (Kaohsiung)
	Fuh, 2005 ⁽¹⁸⁾	320	NPI	47%
Anxiety	Liu, 1999 ⁽¹⁵⁾	103	BEHAVE-AD	35%
	Fuh, 1999 ⁽³⁴⁾	76	RMBPC	76%
	Fuh, 2001 ⁽¹⁶⁾	95	NPI	54%
	Chow, 2002 ⁽¹⁷⁾	230	NPI	39% (Taipei), 38% (Kaohsiung)
	Fuh, 2005 ⁽¹⁸⁾	320	NPI	37%
Delusions	Hwang, 1996 ⁽¹³⁾	54	BEHAVE-AD	63%
	Liu, 1999 ⁽¹⁵⁾	103	BEHAVE-AD	30%
	Fuh, 2001 ⁽¹⁶⁾	95	NPI	47%
	Chow, 2002 ⁽¹⁷⁾	230	NPI	31% (Taipei), 40% (Kaohsiung)
	Fuh, 2005 ⁽¹⁸⁾	320	NPI	31%
Hallucination	Hwang, 1996 ⁽¹³⁾	54	BEHAVE-AD	26%
	Liu, 1999 ⁽¹⁵⁾	103	BEHAVE-AD	26%
	Fuh, 2001 ⁽¹⁶⁾	95	NPI	21%
	Chow, 2002 ⁽¹⁷⁾	230	NPI	25% (Taipei), 19% (Kaohsiung)
	Fuh, 2005 ⁽¹⁸⁾	320	NPI	24%
Sleep disturbance	Hwang, 1997 ⁽¹⁴⁾	75	BEHAVE-AD	61%
	Liu, 1999 ⁽¹⁵⁾	103	BEHAVE-AD	26%
	Fuh, 2001 ⁽¹⁶⁾	95	NPI	36%
	Chow, 2002 ⁽¹⁷⁾	230	NPI	36% (Taipei), 35% (Kaohsiung)
	Fuh, 2005 ⁽¹⁸⁾	320	NPI	42%
Aggression/agitation	Tsai, 1996 ⁽²²⁾	47	BEHAVE-AD	57% (physical)
	Hwang, 1997 ⁽¹⁴⁾	75	BEHAVE-AD	55% (physical)
	Liu, 1999 ⁽¹⁵⁾	103	BEHAVE-AD	Verbal: 21%, physical: 10%
	Fuh, 1999 ⁽³⁴⁾	76	RMBPC	Verbal: 35%
	Fuh, 2001 ⁽¹⁶⁾	95	NPI	46%
	Chow, 2002 ⁽¹⁷⁾	230	NPI	46% (Taipei), 40% (Kaohsiung)
	Fuh, 2005 ⁽¹⁸⁾	320	NPI	39%
Apathy	Fuh, 2001 ⁽¹⁶⁾	95	NPI	44%
	Chow, 2002 ⁽¹⁷⁾	230	NPI	47% (Taipei), 39% (Kaohsiung)
	Fuh, 2005 ⁽¹⁸⁾	320	NPI	42%

SCID: structure clinical interview for DSM-IIIIR⁽³⁶⁾; NOS: not otherwise specific; BEHAVE-AD: Behavioral Pathology in Alzheimer's Disease rating Scale⁽³⁸⁾; NPI: Neuropsychiatric Inventory⁽³⁹⁾; RMBPC: Revised Memory and Behavior Problem Checklist⁽⁴³⁾.

boarder symptoms (belief that imaginary people were in the house) was the most common subtypes of misidentification and the prevalence was about 22%-23% among patients with AD^(13,20,31). The second common subtype of

misidentification was belief that house is not the patient's home and the prevalence of misidentification was about 16%^(13,15).

Eating disorders

Three reports using NPI showed 29%-35% patients with AD had appetite changes^(16,17,18). Two articles showed 31%-36% patients had hyperphagia^(14,24). Pica phenomenon was found in 8% patients in one report⁽²³⁾.

Miscellanea

Wandering was found in 26%-45% patients with AD^(14,15,21), hoarding behavior 23%-36%^(14,27) and inappropriate sexual behavior 8%-15%^(14,28).

BPSD and severity of dementia

In the reviewed literature, 16 studies investigated the relationship of BPSD and severity of dementia or cognitive functions^(13,14,16,18,26,28-30,34) but only four of them found significant relationships between them^(14,18,21,34). Parts of those results were controversial. One study using RMBPC⁽⁴³⁾ for measurement found the frequency score of disruptive behaviors increased significantly with the severity of dementia⁽³⁴⁾ but the other studies did not find agitation or physical aggression associated with the severity of dementia or cognitive impairment^(14,16,18,22). Wandering was significantly associated with the severity of cognitive impairment from 2 studies^(14,21). Hyperphagia was found significantly associated with the severity of cognitive impairment in one study⁽¹⁴⁾ but no association in the other one conducted by the same study group⁽²⁴⁾. The patients with pica phenomenon had significantly lower cognitive scores in one report⁽²³⁾. Sleep disturbance was found associated with the severity of cognitive impairment in one study⁽¹⁴⁾ but not in the other studies^(16,18). The prevalence of delusions, hallucinations and aberrant motor activities increased significantly as the severity of dementia increased in patients with AD from one large scale survey using NPI⁽¹⁸⁾ but not in the other studies^(13,16,25,26,29).

DISCUSSION

Our review confirmed that the BPSD was very common in Taiwanese patients with AD. The differences of the prevalence of BPSD were due to various definitions of specific BPSD, different clinical settings (psychiatric

inpatients and neurological outpatient clinic patients) and different measurement tools. In general, higher rates of BPSD were obtained when the study was conducted in psychiatric inpatients than in a neurological outpatient clinic and/or information was gathered from caregivers' rating. The highest prevalence of anxiety was measured by RMBPC⁽⁴³⁾ which asked the caregiver to rate the frequency of "patient appears anxious or worried". The NPI was rated by the caregivers as well, but, the screening question was more specific. Only one study used SCID⁽³⁷⁾ and was rated by a psychiatrist in our review which showed a lower rate of depression compared with studies evaluated by the other instruments. The strict criteria might underestimate the prevalence. Conversely, the lack of clarity may result in an overestimation of prevalence rates of BPSD.

Wide ranges in the prevalence of BPSD were also found in Western studies^(45,46). Similar to the results of our review, a review by Ropacki and Jeste published in 2005, of 55 studies showed a higher prevalence of BPSD tended to occur in inpatient settings⁽⁴⁶⁾. The median prevalence was 36% (range 9%-63%) for BPSD and 18% (range 4%-41%) for delusion in this review⁽⁴⁶⁾, which was similar to our present review. The presence of similar prevalence rates among different ethnic groups implies these symptoms are neurobiologically determined.

Two cross-cultural studies in our review compared the prevalence rates of BPSD among Taiwanese patients and Caucasian ones^(17,35). One study showed the manifestations of agitation were different among the AD patients in Taiwan, US and Italy⁽³⁵⁾. The other study revealed the prevalence of most BPSD except that apathy was similar between Taiwanese and US samples⁽¹⁷⁾. The interpretation of apathy and agitation may be a culturally sensitive interpreted trait. Our review highlights the importance of developing cross-cultural applicable criteria and rating scales for the assessment of BPSD.

Similar to our inconsistent findings, the severity of cognitive impairment showed a significantly positive association with the presence of BPSD in patients with AD in 20 studies and no association in 10 studies in a recent review⁽⁴⁶⁾. It might be due to a general failure to

recruit enough numbers of severely demented patients in the studies used in our review and that done by Ropacki and Jeste⁽⁴⁶⁾. In addition, the association between BPSD and cognitive impairment might be influenced by the other factors such as medications. No community-based or longitudinal studies of BPSD in Taiwan were found in our review. Further study is needed to explore their relationship.

A limitation of the present review is that all these studies were conducted in medical centers located in metropolitan areas. One should be cautious to generalize these data to the other clinical or community settings.

CONCLUSIONS

BPSD is common in patients with AD in Taiwan. Except for agitation or apathy, the frequencies of other BPSD are similar to those of in Western studies. Development of cross-culturally applicable methods for assessment and treatment protocols for BPSD evaluation and study are both needed and important.

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