

A comparative study of behavioral and psychological symptoms in patients with vascular and Alzheimer dementia

S Javed, RK Gaur, A Ibrahim, PP Singh, M Ahmad

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Abstract

Background

Dementia is a common, disabling disorder of the elderly. With the steady growth in the older population, the rate of dementia is expected to increase two fold by 2030 and three fold by 2050. Dementia of Alzheimer Type (DAT) and vascular dementia (VD) are among the most common types of dementia. Behavioral and psychological symptoms of dementia (BPSD) are associated with increased patient morbidity and carer burden.

Aims

The objective of this study was to compare symptoms of BPSD in patients with DAT and VD and to explore the correlates of BPSD in patients with DAT and VD.

Methods

Persons aged over 60 years, attending an outpatient clinic tertiary care centre in Northern India, who met diagnostic criteria for either DAT or VD, were

included in the study. Outcomes of interest include socio-demographic details, level of cognitive functioning and the nature and severity of BPSD.

Results

A total of 64 patients were included in the study, of whom 43 had DAT and 21 suffered from VD. Disturbance of activity levels was the most commonly seen feature of BPSD in both patients with DAT and VAD. There was no significant difference in the levels BPSD or of cognitive functioning between the two groups.

Conclusions

BPSD is a common feature in patients with dementia. Increased clinician awareness and management of this problem is required to improve patient care and reduce carer burden.

Key words: dementia, behavioral and psychological symptoms of dementia, factor analysis, Neuro-psychiatric inventory.

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Background

Dementia is characterized by loss of or decline in memory and other cognitive abilities and reduces the lifespan of affected people (1-2). Dementia is often associated with physical, mental and financial burden, and evidence suggests that elderly people with dementia in developing countries often do not utilize care services; and when they do the health care system is often ill-prepared to provide quality services for dementia (3). In 2005, it was estimated that 24.3 million worldwide and 1.8 million people in India were affected with dementia (1). In India the number of people with dementia of Alzheimer type (DAT) and other dementias are increasing every year. With the steady growth in the older population and stable increment in life expectancy, the rate of dementia is expected to increase two fold by 2030 and three fold by 2050 (2).

DAT and vascular dementia (VD) are among the most common types of dementia. In those over 65 years two-thirds of dementia is found to be DAT and 20-30% are diagnosed as VD (4-5). Behavioral and psychological symptoms of dementia (BPSD) are more common in

certain types of dementia (6). In the early stage of DAT common symptoms of BPSD include passivity, lack of spontaneity and reduced initiatives, which may be interpreted as apathy and depression (7). In VD, patients often retain a degree of insight for a longer time, and may react to the awareness of deficits with anxiety and depression. Labiality and explosive emotional outbursts, episodes of noisy weeping or laughing may occur on minor provocation in VD, often without accompanying subjective distress or elation (8).

BPSD have been described as symptoms of disturbed perception, thought content, mood and behavior that frequently occur in patients with dementia (9). BPSD have been found to be associated with a more rapid cognitive decline in patients with dementia and to correlate negatively with their survival (10-11). Psychological symptoms of dementia include psychotic symptoms, affective symptoms, anxiety and sleep disturbances. Behavioral symptoms of dementia are usually identified by the observation of the patient, and include aggression, agitation, apathy, wandering, catastrophic reactions, intrusiveness, negativity, sexual disinhibition, and eating behavior disturbances.

Preliminary studies of BPSD from India have reported high prevalence rates comparable to most western studies, with caregivers reporting these symptoms as distressing and difficult to manage (12). However, previous studies in India have not compared BPSD between different types of dementia. DAT and VD are known to differ in their cognitive profiles, especially in the early stages, so it is of interest to examine whether BPSD manifest differently in these two types of dementia (13). Hence the objective of this study was to compare symptoms of BPSD in patients with DAT and VD and to explore the correlates of BPSD in patients with DAT and VD.

Methods

Participants

This study was conducted among outpatients attending a tertiary care center of Northern India. The study received approval from the Ethical Committee of the institute, and informed consent was obtained from participants or the caregiver. Study participants were persons with DAT or VD who attended the psycho-geriatric clinic, at the Department of Psychiatry, Jawaharlal Nehru Medical College, Aligarh Muslim University, Aligarh India. All subjects meeting the criteria for diagnosis of DAT or VD according to the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV TR), aged more than 60 years, were considered eligible for inclusion in the study. Patients with other diagnosed psychiatric illness, delirium, and mental retardation were excluded from the study. A total of 64 patients with dementia (43 patients with DAT and 21 with VD) who attended the clinic during the study period, who met inclusion criteria, were included in the study.

Outcomes of interest and measures

Behavioral Pathology in Alzheimer's Disease Rating Scale (BEHAVE-AD)

Caregivers were interviewed using the Behavioral Pathology in Alzheimer's Disease Rating Scale (BEHAVE-AD) to explore BPSD in participants (14). This scale assesses seven categories of symptoms and 25 characteristic symptoms that occur in these seven categories, during the preceding 2 weeks. The seven categories assessed are: (a) paranoid and delusional ideation; this section has 7 items and according to this scale, a delusion is defined as "a false conviction, not a misidentification", (b) hallucinations; this category has 5 sub items and measures visual, auditory, olfactory, haptic and other types of hallucinations, (c) activity disturbances; with 3 sub items – namely, wandering, purposeless activity and inappropriate activity, (d) aggressiveness; which explores for verbal outbursts, physical threats and agitation, (e) diurnal rhythm disturbances – which considers the presence of day night disturbance, (f) affective disturbances: it consisted

of 2 items which are tearfulness and depressed mood, and finally (g) anxieties and phobias; this measured anxiety regarding four areas – anxiety regarding upcoming events, fear of being left alone, other anxieties and phobias. Overall the BEHAVE-AD assesses the magnitude of each of the 25 symptoms in these seven categories using a 4-point rating scale, scores ranging from not present (a score of 0), to severe (a score of 3); the latter generally signifies an emotional and physical component to the symptoms. The total BEHAVE-AD scores range from 0 to a maximum score of 75. This scale also contains an overall rating of the degree to which these symptoms are troubling to the caregiver and/or dangerous to the patient. The BEHAVE-AD has been shown to be a reliable and valid instrument.

Clinical Dementia Rating Scale (CDR)

The participant's cognitive functions were assessed using a structured-interview protocol, the CDR, developed by John C. Morris and colleagues at Washington University School of Medicine (15). This tool assesses cognitive functions in six areas, namely memory, orientation, judgment and problem solving, community affairs, home and hobbies, and personal care.

Hindi Mini Mental Status Examination (HMSE)

The Hindi mini mental state examination (HMSE) was also administered as a further objective assessment of cognitive deficits. The HMSE is a modified version of the mini mental state examination and has been standardized for use in the Indian population (16-17).

Semi-structured performa for collection of socio-demographic and clinical details

A specifically designed semi-structured performa was used to record the socio-demographic data, and data on the presenting complaints, history of present illness, past history, family history, personal history, premorbid personality, medical history, physical examination, mental status examination, and diagnosis.

Procedure

All patients who attended the psycho-geriatric clinic between January 2013-April 2014 and who met inclusion criteria, were examined using the HMSE and the CDR. Assessment of behavioral problems was done by clinical interview of the patient and also the primary caregiver. The primary caregiver was defined as the caregiver who had been in most contact with the patient for at least three weeks. Behavioural and psychological symptoms were assessed using the BEHAVE-AD. Data analysis was performed using the Statistical Package for Social Sciences version 17 (SPSS-17).

Results

A total of 64 patients were included in the study, 43 of whom were diagnosed to have DAT and 21 VD. Of 43 persons with DAT, 23 (53%) were aged 60-70 years, 11 (26%) aged 70-80 years and 9 (21%) were between the ages of 80-90 years. Of the 21 patients with VD, 18 (86%) patients were in the age range of 60-70 years, and 03 (14%) were aged 70-80 years. With regards to gender distribution, there were 29 (67%) males among patients with DAT, and 16 (76%) males among patients with VD (Table 1).

The mean differences of scores on the BEHAVE-AD, HMSE, CDR measures between participants with AD and VAD are shown in table 2. There was no significant difference between the two subtypes of dementia with regards to the Behave AD, HMSE and CDR scores.

Figure 1 compares the BEHAVE-AD subscales scores, of patients with AD and VAD. The most frequent symptom dimension noted among the subscales for both groups of patients was activity disturbances. Over one-third (33.68%) of patients with VD and one fourth (25.27%) of patients with DAT had problems related to activity. In patients with DAT the occurrence of BPSD features in decreasing frequency were: Activity disturbances, followed by diurnal rhythm disturbances (21.43%), aggressiveness (14.84%), paranoid and delusional ideation (12.64%), affective disturbances (12.09%), hallucination (9.34%) and lastly, symptoms of anxiety and phobia (4.4%). In those with VD, following activity disturbances, the more frequently documented BPSD symptoms were, in decreasing frequency: Aggressiveness (23.76%), diurnal rhythm disturbances (20%), affective disturbances (9.47%), paranoid and delusional ideations (6.31%), anxiety and phobia (4.21%) and least frequently, hallucinations (3.16%).

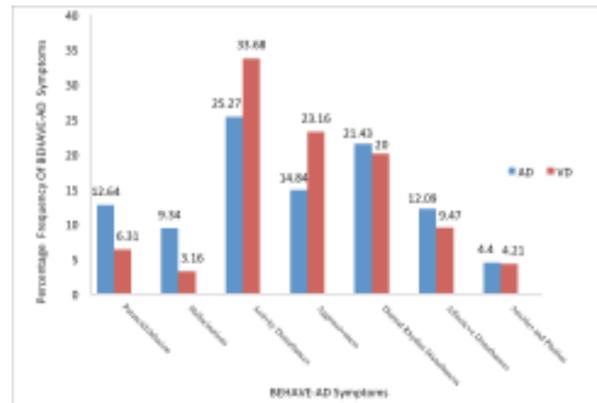


Figure 1. Comparison of the BEHAVE-AD subscale scores, in patients with AD and VAD.

When BPSD symptoms between the AD and VAD patients were compared, no significant difference was seen with regards to occurrence of paranoid and delusional ideation ($t=0.887$, $p=0.378$), hallucinations ($t=0.942$, $p=0.350$), activity disturbances ($t=1.08$, $p=0.283$), aggressiveness ($t=1.05$, $p=0.296$), diurnal rhythm disturbances ($t=0.008$, $p=0.994$), affective disturbances ($t=0.290$, $p=0.773$), or anxiety and phobia ($t=0.028$, $p=0.978$).

BEHAVE-AD and CDR scores was found to be negatively correlated in patients with DAT (-.25) and positively correlated in patients with VD patients (+.122) but this relationship was very weak. Neither association was statistically significant (Table 3). There was moderately strong negative relationship between CDR and HMSE scores, with AD patients having a correlation coefficient of -.746 and patients with VD having a correlation coefficient of -.565. There was a negative correlation between HMSE and Behave-AD for both AD and VD patients, but this correlation was very weak and not statistically significant.

Table 1. Socio-demographic characteristics of patients with DAT and VD included in this study

Variable	DAT (N=43) n/n%	VD (N=21) n/n%	Test of significance	p value
Age			t	
60-70	25(53)	18(86)		
71-80	11(26)	03(14)	2.902	.005*
81-90	09(21)	00		
Gender			X²	
Male	29(14)	16(76)		
Female	14(33)	05(24)	.517	.475
Education			F	
Illiterate	06(14)	02(10)		
<10	18(42)	08(38)		.811
>10	19(44)	11(52)	.459	
Marital status			F	
Married	34(80)	21(100)		
Unmarried	01(02)	00		.061
Divorced/Widowed	08(18)	00	5.19	
Religion			X²	
Hindu	24(56)	06(29)		.261
Muslim	19(44)	15(71)	4.93	
Domicile			X²	
Urban	26(60)	12(57)		.318
Rural	17(40)	09(42)	.997	

Table 2. Comparison of patients with AD and VAD, with regards to mean scores of the BEHAVE-AD, HMSE and CDR scores

Diagnosis	N	Mean Score	Standard Deviation of mean score	t value	p value	
BEHAVE AD	DAT	43	5.32	4.80	.174	0.862
	VD	21	5.57	6.18		
HMSE	DAT	43	18.83	5.26	.150	0.481
	VD	21	19.04	5.30		
CDR	DAT	43	11.31	3.82	.709	0.881
	VD	21	10.57	4.14		

Table 3. Examination of correlations between BEHAVE-AD, CDR & HMSE scores in patients with AD

Dimension	Groups	Number	Mean score	SD	correlation	p value
BEHAVE-AD CDR	AD	43	5.32	4.80	-0.250	0.86
	VD	21	5.57	6.18	.122	0.098
CDR HMSE	AD	43	11.31	3.82	-0.746	0.005
	VD	21	10.51	4.14	-0.565	0.008
HMSE BEHAVE-AD	AD	43	18.83	5.26	-0.026	0.86
	VD	21	19.04	5.30	-0.098	0.67

Discussion

About 90% of patients with dementia experience symptoms of BPSD (18). Among the different types of dementia, BPSD have been best studied in Alzheimer’s disease; few studies have compared BPSD in DAT and VD. In this study we attempt to address this gap in the literature.

In our study, there were no significant differences in socio demographic details of patients with VD and DAT at baseline. Thus any difference seen on the BEHAVE-AD scale is unlikely to be due to any socio-demographic differences between the two patient groups. VD was characterized by a much younger mean age of onset than DAT in this study, which is compatible with previous observations (19).

No significant difference was found between the two groups of patients in this study, with regards to HMSE and CDR scores. C. Ballard in his study on the progression of cognitive impairment in dementia with Lewy bodies, vascular dementia and Alzheimer disease reported that the magnitude of cognitive decline was similar in different types of dementia (20). On the other hand Sultzer DL, in his study entitled “A comparison of psychiatric symptoms in vascular dementia and Alzheimer disease” reported that patients with VD had more cognitive impairment compared to patients with DAT, as indicated by the neurobehavioral rating scale total scores (21). In contrast Cummings et al., in their

study revealed that patients with DAT were significantly more cognitively impaired than patients with VD (22). Thus international evidence on comparison of the degree of cognitive impairment in different types of dementias is conflicting, and there appears to be no overall consensus.

The results of this study indicate that there was no significant difference in the prevalence of BPSD between patients with DAT and VD. This finding is consistent with the findings of Lyketosos et al., who also found no significant difference in BPSD between different dementia subtypes (23). This is contrast to findings of some previous studies, which have reported that patients with DAT often manifested more motor behavior disturbances, aggressiveness, mood disturbances and psychotic symptoms than VD (24-25).

Muller-Spahn reported that approximately 30-50% of DAT patients have delusions and hallucinations (26). Another review of 24 studies of psychosis in dementia involving more than 2200 patients, reported delusions to be present in 11-73% of all patients (27). In this study 12.6% of patients with DAT and 6.31% VD patients had delusions, whereas 9.34% patients of DAT and 3.16% patients with VD had hallucinatory behavior. There was no significant difference in the rates of psychotic symptoms reported in DAT and VD patients in our study. This is in contrast to some previous studies, which have reported higher frequency of delusion and hallucinations

in patients with VD (28). Cummings et al (27) suggested that the frequency of persecutory delusions in VD is greater than in DAT, and that the frequency of hallucinations is higher in patients with DAT; while Berrios and Brook (29) found it comparable in all dementias.

Activity disturbances, diurnal rhythm disturbance and aggression are among the most commonly seen BPSD, and it has been suggested that patients with AD have a higher frequency of aggression (30). In keeping with these findings, our study too, activity disturbance was the most commonly seen BPSD symptom in both DAT and VD patients, followed by diurnal rhythm disturbance and aggression. However we found no significant difference in the rates of activity disturbances, diurnal rhythm disturbances and aggression between two types of dementia. However, although not statistically significant, the relatively higher levels of activity disturbance and aggression in patients with VD in our study may have a significant impact on caregivers, increasing caregiver burden.

The reported rates of depression across various types of dementia are controversial, with some investigators reporting a higher frequency of depression in AD compared to other types, and others reporting the contrary (31). Depression in patients with dementia is due to neurotransmitter imbalance associated with the underlying disease process, and may also be precipitated by the patient's recognition of their cognitive impairment (32). Our study did not reveal any significant difference in symptoms of depression, anxiety or phobia, between the two types of dementia.

Differences in rates of BPSD reported by different studies may be due to several factors, including the use of different scales in assessment, as well as cultural differences. The manifestations of BPSD symptoms can vary to some degree according to the patients' ethnic, cultural and social background (24-25). Apathy and depression is reported more in western cultures (24-25) in contrast to more activity disturbance and aggressiveness reported in patients from non-western backgrounds.

BPSD not only increases caregiver burden but also increases the disability in patients with dementia. It is associated with accelerated impairment of daily living activities, increased cognitive decline and worsens quality of life. BPSD have been found to be associated with more rapid cognitive decline in patients with dementia and correlates negatively with their survival.

No significant relationship was found between scores of BEHAVE-AD and CDR, or BEHAVE-AD and HMSE in our study. The relationship between the degree of cognitive impairment and BPSD is a controversial one. Some studies suggest that increased cognitive impairment leads to increased BPSD whereas some research contradicts this hypothesis (33-34). A cross

sectional, observational and multicenter study conducted in 115 neurology centers in Spain, which included 1014 participants, reported a worsening of BPSD symptoms as cognition decreased. M.J.Chiu et al., in his study of 137 patients with dementia reported that MMSE scores showed a significant negative correlation with subscales of BEHAVE-AD (33).

Limitations

Since our study was conducted at an outpatient clinic, more patients with behavioural symptoms may have been included in the study, compared to patients in the community. Second, previous treatment, either with psychotropic agents or anti-dementia medication, may have influenced the severity and total scores of BPSD. BEHAVE-AD has the limitation of being scored by the examiner based only upon the impressions gathered during a single interview with the patient and caregiver; thus the examiner might be overly influenced by his or her snapshot impression of the patient at the time of the interview, which may not be representative of patient's behavior during his or her typical daily routine.

Conclusions

Dementia is a common, disabling and progressive disorder. The high prevalence of BPSD in patients suffering from both DAT and VD, indicates that the assessment of behavioral symptoms is of great importance in clinical practice. This will allow better management of patients with dementia, and improved provision of support to care-givers.

Disclosure Statement

None declared

S Javed, R K Gaur, Department of Psychiatry, Jawaharlal Nehru Medical College and Hospital, Aligarh Muslim University

A Ibrahim, Teerthankar Mahavir University

P P Singh, M Ahmad, Department of Psychiatry, Jawaharlal Nehru Medical College and Hospital, Aligarh Muslim University

Corresponding author: S Javed

Email: sarah.javed03@yahoo.com

 <http://orcid.org/0000-0001-5155-743X>.

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