Clinical Aspects of Behavioural and Psychological Symptoms in Vascular Dementia

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Abstract - Dementia is a growing problem that presents increasing challenges for health services worldwide. Vascular dementia is the 2nd most common type of dementia after Alzheimer dementia. The aim of the study is to describe the clinical aspects of behavioural and psychological symptoms in patients aged ≥ 60 years diagnosed with vascular dementia. A cross sectional study was carried out in the Psychiatric Centre at tertiary care hospital from Dec 2018 to May 2019 involving elderly (≥ 60 years) with vascular dementia. Patients with other dementia types, condition and medication that stimulate cognitive disturbances were excluded. The tools used were Hindi mini mental status examination (HMSE), Zarit Burden Interview and the 12- item Neuropsychiatric inventory (NPI). All patients presented with two or more behavioural symptoms, Irritability was the most common symptom (80 %) followed by Night-time behaviour (60 %) and Agitation/aggression (50 %). There was a significant association between Zarit Score and Behavioural Symptoms (p = 0.023), as well as HMSE and Zarit score (p = 0.03). Caregiver burden showed significant correlation with delusion, hallucination, disinhibition, aberrant motor behaviour and night-time behaviour. Most of the patients had multiple behavioural symptoms. Irritability was the most common symptom followed by night-time behaviour and Agitation.

Key words: dementia, vascular; neurobehavioral manifestations; behavioural symptoms

Introduction

Dementia is a growing problem that presents increasing challenges for health services worldwide. 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]. Vascular dementia is the 2nd most common type of dementia after Alzheimer dementia, which accounts for around 20-30 % of dementia cases [3,4]. In Vascular Dementia, patients often retain a degree of insight for a longer time, and may react to the awareness of deficits with anxiety and depression. Mood lability and explosive emotional outbursts, episodes of noisy weeping or laughing may occur on minor provocation in Vascular Dementia, often without accompanying subjective distress or elation [5]. Behavioural and psychological symptoms

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in dementia (BPSD) have been described as symptoms of disturbed perception, thought content, mood and behaviour that frequently occur in patients with dementia [6]. BPSD have been found to be associated with a more rapid cognitive decline in patients with dementia and to correlate negatively with their survival [7,8]. Psychological symptoms of dementia include psychotic symptoms, affective symptoms, anxiety and sleep disturbances. Despite the importance of this subject, available data about the neuropsychiatric profile of vascular dementia in the literature is insufficient and few studies reflect the circumstances in India. To our knowledge, this is the first study in Rajasthan to assess clinical aspect of BPSD and care giver burden in patients with vascular dementia attending psychiatric center (Mental Hospital). The aim of this study was to describe the clinical aspect of behavioural and psychological symptoms of vascular dementia in patients aged ≥ 60 years.

Materials and Methods

A cross sectional observational study was performed from Dec 2018 to May 2019 at Psychiatry Centre of SMS Hospital Jaipur. The study included the outdoor patients of both sexes, aged ≥ 60 years, HMSE score < 25 and diagnosis of vascular dementia confirmed by using ICD 10. Brain imaging and other blood investigations were done to rule out other pathology. Patients with other dementia condition and medication that stimulate cognitive disturbances, history of alcohol intake, drug abuse were excluded. Patients and their caregiver who did not give consent were also excluded. A total number of 45 patients were initially taken but only 30 patients satisfied the criteria. The study received approval from the Ethical Committee of the SMS Medical College, Jaipur and informed consent was obtained from participants or the caregiver.

Tools

1. Semi-structured Performa for collection of socio-demographic and clinical details

2. 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, medical history, physical examination, mental status examination, and diagnosis.

3. Hindi Mental State Examination (HMSE)

4. The HMSE is a modified version of the mini mental state examination and has been standardized for use in the Indian population. It is a 30 - point scale and a score of < 25 is considered as dementia [9].

5. Neuropsychiatric Inventory (NPI)

6. Assessment of the behavioural and psychological symptoms was performed with the 12 items Neuropsychiatric Inventory (NPI), which was originally developed by Cummings and associates to provide a means of assessing neuropsychiatric symptoms of patients with Alzheimer's and other neurodegenerative disorders. Ten behavioural (delusions, hallucinations, agitation/aggression, depression/dysphoria, anxiety, elation/euphoria, apathy/indifference, disinhibition, irritability/lability, and aberrant motor behaviour) and two neuro-vegetative areas (sleep and night-time behaviour disorders, and appetite and eating disorders) are included in the NPI [10,11].

7. The Zarit Burden Interview (ZBI) – ZBI is a standard, validated tool which was used to assess the caregiver burden on family caregivers (Cronbach's alpha = 0.92). It is a 5-point (0 - 4; a higher score denotes higher burden), 22 -item Likert scale, which assess the five main domains of burden namely health, psychological well-being, finances, social life and relationship with the patient [12].

8. Laboratory investigations – Laboratory investigations include: blood sugar fasting, serum urea and creatinine, SGOT, SGPT, alkaline phosphatase, total serum proteins, serum sodium, serum potassium, serum calcium, HIV I & II, thyroid function tests, vitamin B12 levels and urine R/M.

9. Imaging – computerized tomography (CT)/ Magnetic resonance imaging (MRI) of the brain

Data was collected and proper statistics was applied. A descriptive summary such as mean, standard deviation for continuous variable, frequencies percentage for categorical variable were determined. Relations between dependent and independent variables established using non-parametric tests (Spearman's correlation), since none of the variables had a normal distribution at level of significance of < 0.05.

Results

The average age was 75.5 ± 6.7 years (mean ± SD). 18 (60 %) were males and 12 (40 %)

Table 1. Distribution of clinical characteristics of patients with vascular dementia

Sample characteristic		Total = 30 N (%)
Age (years)	60 - 75	15 (50)
	76 - 89	15 (50)
Sex	Male	18 (60)
	female	12 (40)
Literacy Rate	Literate	3 (10)
	Illiterate	27 (90)
HMSE	< 13	24 (80)
	13 -24	6 (20)
Total Duration of Illness (years)	< 2	12 (40)
	> 2	18 (60)

Table 2. Caregiver characteristics

Age of caregivers (years)	54.2 ± 12.1
Types of care giver	Spouse (38 %)
	Son/daughter in law (52 %)
	Others (10 %)
Zarit Burden Score	28.4 ± 8.1
Severity of caregiver burden	Little/no (3 %)
	Mild to Moderate (27 %)
	Moderate to severe (33 %)
	Severe burden (37 %)

were females, with average total duration of illness of 2.6 ± 1.2 years (mean ± SD) and mean HMSE score of 9.1 ± 4.1 (Table 1).

In all the cases primary caregiver was a family member except in one case where pri-

mary caregiver was a paid/commercial caregiver (Table 2).

The prevalence of behavioural and psychological symptoms was 100 %. All the patients presented had two or more symptoms. Irritability was the most common symptom present in 24 (80 %) patients, followed by Night-time behaviour in 18 (60 %) patients and Agitation/aggression 15 (50 %) patients. Anxiety, euphoria and aberrant motor symptoms were presents in 12 (40 %) patients each. Caregiver burden showed significant positive correlation with delusion, hallucination, agitation, disinhibition, aberrant motor behaviour and night-time behaviour (Table 3).

There was a significant association between Zarit Score and the number of behavioural symptoms (rho = 0.703, p= 0.23), and a significant negative correlation between Zarit Score and HMSE (rho = - 0.681, p = 0.030). Multiple ordinal regression was performed to determine whether Zarit Score was significantly correlated with number of behavioural symptoms (Table 4).

Table 3. Neuropsychiatric Symptoms and correlation with care giver burden

		Zarit Burden interview	
12 item NPI Symptoms	No. of patients (%)	rho	P value
Delusions	9 (30)	0.29	0.01
Hallucinations	3 (10)	0.35	0.02
Agitation/aggression	15 (50)	0.23	0.06
Dysphoria/ depression	6 (20)	0.11	0.33
Anxiety	12 (40)	0.13	0.21
Euphoria / Elation	12 (40)	0.23	0.30
Apathy/ Indifference	10 (33)	0.20	0.31
Disinhibition	9 (30)	0.29	0.02
Irritability	24 (80)	0.25	0.22
Aberrant Motor	12 (40)	0.39	0.01
Night-time Behaviour	18 (60)	0.31	0.02
Appetite/ Eating	3 (10)	0.12	0.30

Discussion

In this study, we found that irritability was the most common behavioural symptom in

Table 4. Correlation between different factors

	TDI v/s ZS	TDI v/s HMSE	TDI v/s NOS	HMSE v/s NOS	ZS v/s HMSE	ZS v/s NOS
Spearman's correlation (rho)	- 0.523	- 0.265	- 0.349	- 0.215	- 0.681	0.703
P value	0.121	0.459	0.323	0.552	0.030 *	0.023 **

TDI - Total duration of illness, ZS - Zarit Score, HMSE - Hindi mental status examination, NOS - Number of symptoms.

patients with vascular dementia. Although, the previous studies showed the highest prevalence of apathy, agitation and anxiety [13,14]. Reason being, previous studies were performed at a neurology centre where most of the patients diagnosed as vascular dementia presented early with initial symptoms that occurs due to cerebrovascular accidents, whereas at psychiatric centre, patients presented most commonly due to the behavioural symptoms (such as irritability). Night-time behaviour and agitation/aggression were among the second commonly seen behavioural and psychological symptoms in this study. Similarly, retrospective hospital record based study conducted at the Institute of Human Behaviour and Allied Sciences, Delhi, suggested that patients with vascular dementia have a higher frequency of aggression [15].

Prevalence of hallucination and delusions in this study was 30 % and 10 % respectively, which was reported same in previous studies [14,16]. Due to the progression of the dementia, cognition (HMSE score) and severity of BPSD symptoms declines. Previous study also suggested that severity of psychosis decrease with the duration of dementia [17]. The results of this study are consistent with an aging population, especially considering cerebral and systemic vascular disease consequences. One of the explanations for the negative relationship between disease progression and number of BPSD symptoms might be a good response to treatment. This increases the quality of life through multidisciplinary neuro-rehabilitation

[18-23]. Caregiver burden had significant association with positive neuropsychiatric symptoms (delusion, hallucination, agitation, disinhibition, aberrant motor behaviour and night-time behaviour), this finding is similar to the previous study conducted on Alzheimer's dementia patients [24].

This is a clinic-based study conducted in a tertiary care psychiatry centre, which may have led to referral bias. This, along with the small sample size, limits the generalizability of the results. This being a cross-sectional study, longitudinal relationships among the total duration of study, numbers of symptoms and Zarit score cannot be definitively established. We diagnosed the types of dementia based on clinical criteria supported by radiological parameters, but did not use pathological (autopsy) confirmation. However, as the criteria (ICD - 10) used were well established, we feel that they should be sufficient for all practical purposes of this clinical study.

Most of the patients with vascular dementia had multiple behavioural symptoms among which the most common were irritability followed by night-time behaviour and agitation/aggression. However, positive neuropsychiatric symptoms (delusion, hallucination, agitation, disinhibition, aberrant motor behaviour and night-time behaviour) are associated with higher caregiver burden. Therefore, early diagnosis and management could improve behavioural symptoms and reduce caregiver burden. Further studies with larger sample size should be conducted to confirm these findings.

Acknowledgments

Conflict of Interest

Funding Sources

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