



A STUDY TO ASSESS THE CAMBRIDGE BEHAVIOURAL INVENTORY REVISED TOOL IN SCREENING BEHAVIOURAL ABNORMALITIES AMONG ELDERLY POPULATION WITH DEMENTIA AT A TERTIARY CARE CENTRE IN KANYAKUMARI.

Internal Medicine

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ABSTRACT

Background: Behavioural abnormalities and cognitive dysfunction are the major disease manifestation and its identification aids in early diagnosis and management and it plays a vital role in improving the quality of life of people with dementia. Cambridge Behavioural Inventory Revised Tool is an informant applied tool for screening behavioural abnormalities among dementia people. This study was conducted with an objective to assess the utility of CBI-R in screening of behavioural abnormalities in dementia in elderly population. **Methodology:** Modified, validated, self administered questionnaire of CBI-R was used. The questionnaire was translated to Tamil language and back translated to English. It was administered to a group of patients with dementia and to a comparison group of individuals without dementia. The prevalence of each behavioural abnormality among these 2 groups was compared. **Result:** The study shows that CBI-R (Tamil version) has good utility in screening behavioural abnormalities in dementia and has equal efficacy when compared to CBI-R in other local languages in India, CBI-R in English and also with NPI. Using CBI-R, it was observed that the 3 most common behavioural abnormalities in the study population with dementia were defects in memory, every day skills and impairment in self-care. Least common abnormality detected was change in beliefs.

KEYWORDS

T-CBI-R (Tamil Cambridge Behavioural Inventory Revised), Behavioural abnormalities, Dementia, Elderly.

INTRODUCTION

Dementia is a syndrome characterized by acquired loss of cognitive and emotional abilities which interfere with daily functioning and the quality of life.¹ About 8.8 million (7.4%) geriatric population in India live with dementia.² Behavioural and psychological symptoms influences prescribing (often hazardous), institutionalization of patients and carer stress.^{3,4} Collateral history from an informant also plays a vital role in diagnosis.⁵ Among the tools available for the screening of behavioural abnormalities among dementia patients, Neuropsychiatric Inventory (NPI) is the best method.⁶ It is a carer-based interview designed to detect a range of neuropsychiatric features, however, it requires training to administer and score and can be time consuming, which limits its applicability in clinical practice. Another popular scale is Cambridge Behavioural Inventory (CBI),⁷ an informant based questionnaire which comprises of 81 items. A shorter version CBI Revised (CBI-R) developed, which consists of 45 items. It is designed to capture decline in cognitive and behavioural domains that can lead to symptoms that impair the activities of daily living (ADL).⁸ The CBI-R scoring range from 0-4. A score of zero denotes no impairment, 1 denoted occasional occurrence (a few times per month), 2 denotes occurrence a few times per week, 3 denotes daily occurrence and 4 constant occurrence. Scores 3 and 4 denotes severe behavioural deficits. In conditions where direct assessment of patients becomes difficult such as patients with hearing impairment and severe cognitive impairment, this informant based questionnaire will help in assessment. It is a easy to administer, cost effective tool. CBI-R has been adapted to various local languages in India; an adaptation in Tamil was not done. Hence this study was conducted with an objective to assess the utility of CBI-R among Tamil speaking population, to identify and manage the behavioural abnormalities among dementia patients so as to provide them with better quality of life.

METHODOLOGY

After obtaining the ethical clearance, a cross sectional study was conducted during the period of November 2018 to December 2019, among the dementia patients, as diagnosed by a neurologist, above 60 years visiting the Sree Mookambika Institute of Medical Sciences, Kanyakumari. A comparison group were the population above the age of 60 without dementia.

Inclusion Criteria

1. Patients with diagnosis of Parkinsonism, Alzheimer's disease, vascular dementia, NPH or meeting the diagnostic criteria based on ICD 10 or with MRI/CT findings.
2. Tamil speaking elderly patients (> 60 yrs) and their informants, who give consent to the study.

Exclusion Criteria

1. Patients with encephalopathy due to sepsis or metabolic conditions

2. Patients who are admitted in ICU

Sample size was calculated using the formula,

$$N = \frac{(Z_{\alpha} + Z_{\beta})^2 \times [P_1(100 - P_1) + P_2(100 - P_2)]}{(P_1 - P_2)^2}$$

$$Z_{\alpha} = 1.96$$

$$Z_{\beta} = 0.84$$

In a study done by Hanock P el al⁹, P₁ was 27.4, P₂ was 3.1

n=31 for each group

Sample size= 62

Data Collection

The questionnaire, CBI-R was modified according to local social and cultural practices. It was translated into the Tamil language and later translated back into English with the aid of a trained linguist. The pretested, validated, self administered questionnaire was used to collect the data from the care takers of the study and comparison group and the frequency of each behavioural abnormality between these two groups were compared. The various behavioural abnormalities across domains of Memory and orientation, everyday skills, self-care, abnormal behaviour, mood, beliefs, eating habits, sleep, stereotypic and motor behaviour and motivation among dementia patients was collected using T CBI-R. The data was analysed in SPSS Software version 23.0. Chi square test and unpaired t test applied to find the statistical significant between the groups. p value less than 0.05 (p<0.05) was considered statistically significant. The sensitivity and specificity was used to assess the efficacy of the T CBI-R.

The findings of the research were compared with other studies in India using CBI-R in other local languages as well as in English and also with research using the Neuropsychiatry Inventory score to determine the usefulness of the Tamil CBI-R (TCBI-R) version.

RESULTS

Demographic Details: Most of the subjects belonged to the age group of 71-80 years. Predominantly male population, (62.5%) and (59.38%) in study and comparison groups respectively. Care givers of the participants had higher secondary education, 34.38 % and 43.75% in study and comparison groups respectively. Among the study group, majority of the care givers were the daughters (34.38%) followed by wives (31.25%), whereas in comparison group, majority were the daughters (37.5%) followed by sons (34.38%).

Table 1: Comparison Of Memory And Orientation Between The Groups

Memory and orientation	Group-I (n=32)					Group-II (n=32)					
	0	1	2	3	4	0	1	2	3	4	
TCBI I.1	n	1	1	13	15	2	32*	0	0	0	0
	%	3.13	3.13	40.62	46.87	6.25	100*	0	0	0	0

TCBI 1.2	n	2	1	16	11	2	32*	0	0	0	0
	%	6.25	3.13	50	34.37	6.25	100*	0	0	0	0
TCBI 1.3	n	1	2	17	10	2	32*	0	0	0	0
	%	3.13	6.25	53.12	31.25	6.25	100*	0	0	0	0
TCBI 1.4	n	3	4	11	13	1	32*	0	0	0	0
	%	9.37	12.5	34.37	40.63	3.13	100*	0	0	0	0
TCBI 1.5	n	3	6	9	13	1	32*	0	0	0	0
	%	9.37	18.76	28.12	40.62	3.13	100*	0	0	0	0
TCBI 1.6	n	6	4	10	11	1	32*	0	0	0	0
	%	18.75	12.50	31.25	34.37	3.13	100*	0	0	0	0
TCBI 1.7	n	8	11	12	1	0	32*	0	0	0	0
	%	25.00	34.37	37.50	3.13	0.00	100*	0	0	0	0
TCBI 1.8	n	15	13	3	0	1	32*	0	0	0	0
	%	46.87	40.62	9.38	0	3.13	100*	0	0	0	0

All in study group had memory problems. Most common memory deficit was losing or misplacing things. Around 53% of dementia patients were having memory deficit with a severity score of 2.

Table-2: Comparison Of Every Day Skills Between The Groups

Every day skills	Group-I (n=32)					Group-II (n=32)				
	0	1	2	3	4	0	1	2	3	4
TCBI 2.1	n 3	7	19	2	1	32*	0	0	0	0
	% 9.37	21.87	59.38	6.25	3.13	100.00*	0.00	0.00	0.00	0.00
TCBI 2.2	n 5	8	17	2	0	32*	0	0	0	0
	% 15.63	25.00	53.12	6.25	0.00	100.00*	0.00	0.00	0.00	0.00
TCBI 2.3	n 4	8	16	4	0	32*	0	0	0	0
	% 12.50	25.00	50.00	12.50	0.00	100.00*	0.00	0.00	0.00	0.00
TCBI 2.4	n 4	7	19	1	1	32*	0	0	0	0
	% 12.50	21.87	59.37	3.13	3.13	100.00*	0.00	0.00	0.00	0.00
TCBI 2.5	n 4	8	18	2	0	32*	0	0	0	0
	% 12.50	25.00	56.25	6.25	0.00	100.00*	0.00	0.00	0.00	0.00

All the subjects in dementia group were having difficulty in carrying out daily activities. The most common impairment was difficulty in using electrical appliances. Around 59% of dementia patients had it with a severity score of 2.

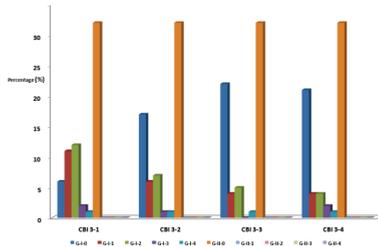


Figure-1: Comparison Of Self-care Between The Groups

All dementia patients were found to have impairment in self-care. The most common impairment was found to be difficulties in self-grooming. Around 37% of dementia patients had it with a severity score of 2.

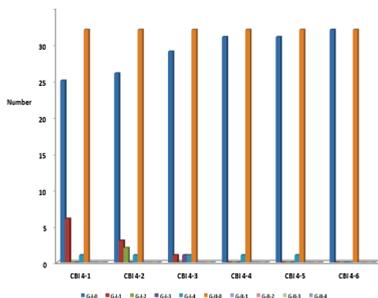


Figure-2: Comparison Of Abnormal Behaviour Between The Groups

18% of the dementia patients showed abnormal behaviour most of them with a severity score of 1

Table-3: Comparison Of Mood Between The Groups

Mood	Group-I (n=32)					Group-II (n=32)				
	0	1	2	3	4	0	1	2	3	4
TCBI 5.1	n 28	2	2	0	0	32*	0	0	0	0
	% 87.50	6.25	6.25	0.00	0.00	100.00*	0.00	0.00	0.00	0.00
TCBI 5.2	n 27	4	1	0	0	32*	0	0	0	0
	% 84.37	12.5	3.13	0.00	0.00	100.00*	0.00	0.00	0.00	0.00
TCBI 5.3	n 29	1	2	0	0	32*	0	0	0	0
	% 90.62	3.13	6.25	0.00	0.00	100.00*	0.00	0.00	0.00	0.00
TCBI 5.4	n 29	2	1	0	0	32*	0	0	0	0
	% 90.62	6.25	3.13	0.00	0.00	100.00*	0.00	0.00	0.00	0.00

Around 12% of the dementia patients were having mood disturbances. Most common mood disturbance was depression or appearing sad with a severity score of 1. None of the dementia patients were found to have abnormal beliefs.

Table-4: Comparison Of Eating Habits Between The Groups

Eating habits	Group-I (n=32)					Group-II (n=32)				
	0	1	2	3	4	0	1	2	3	4
TCBI 7.1	n 31	0	1	0	0	32*	0	0	0	0
	% 96.87	0.00	3.13	0.00	0.00	100.00*	0.00	0.00	0.00	0.00
TCBI 7.2	n 29	3	0	0	0	32*	0	0	0	0
	% 90.62	9.38	0.00	0.00	0.00	100.00*	0.00	0.00	0.00	0.00
TCBI 7.3	n 28	0	2	1	1	32*	0	0	0	0
	% 87.50	0.00	6.24	3.13	3.13	100.00*	0.00	0.00	0.00	0.00
TCBI 7.4	n 26	3	1	1	1	32*	0	0	0	0
	% 81.25	9.36	3.13	3.13	3.13	100.00*	0.00	0.00	0.00	0.00

Around 9% of dementia patients were having abnormal eating behaviour. Most of them had a severity score of 1.

Table-5: Comparison Of Sleep Between The Groups

Sleep	Group-I (n=32)					Group-II (n=32)				
	0	1	2	3	4	0	1	2	3	4
TCBI 8.1	n 7	6	16	3	0	19*	11	2*	0	0
	% 21.87	18.75	50.00	9.38	0.00	59.37*	34.38	6.25*	0.00	0.00
TCBI 8.2	n 2	6	14	9	1	24*	7	1*	0	0
	% 6.25	18.75	43.75	28.12	3.13	75.00*	21.87	3.13*	0.00	0.00

Sleep disturbances were noted in both the study groups. Around 50% of dementia patients had sleep disturbances with a severity score of 2 and 34% of study population without dementia were having sleep disturbances with a severity score of 1.

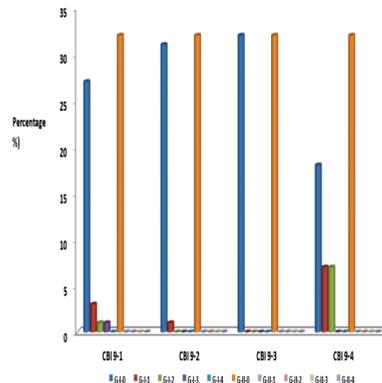


Figure-3: Comparison Of Stereotypic And Motor Behaviours Between The Groups

Around 21% of dementia patients were having stereotypic behaviour with most common being “using same phrases repeatedly”. They had a severity score of 1.

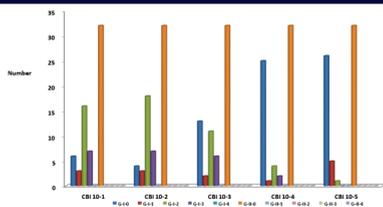


Figure 4: Comparison Of Motivation Between The Groups

Around 56% of dementia patients in our study had impaired motivation. Most common being showing less interest in doing new things with a severity score of 2

Table-6: Comparison Of Study Results With Other Studies

Analysis	Study results	Robert Mathew et.al.,	Helen J wear et.al.,	Constantine G Lyketsos et.al
Sensitivity	67 %	73%	69%	68%
Specificity	83%	85%	84%	89%

DISCUSSION

This study shows that TCBI-R have similar sensitivity (67 %) and specificity (83%) when compared to CBI-R in other local languages in India (sensitivity of 73% and specificity of 85%),¹⁰ CBI-R in English (sensitivity of 69% and specificity of 84%)⁸ and also with NPI (sensitivity of 68% and specificity of 89%).¹¹ Mean CBI score in present study population was found to be 90, implicating that most of the patients had only mild neuropsychiatric manifestations . Most common abnormalities detected were memory impairment (100 %) among which 53% had a severity score of 2, Abnormalities in self care (100%) with 37 percentages having a severity score of 2 and inabilities in self care (100%). The next common abnormality detected was impaired motivation (56%) with a severity score of 2. Sleep disturbances was also one of the common abnormality detected (50%). Abnormal eating habits were detected only in 9% of patients. Abnormal behaviour was detected in 18% of cases and mood disturbances were detected in 12% of cases. Stereotypic and motor behavioural abnormalities were detected in 21 percent of cases. None of the patients with dementia in our study group elicited any abnormal beliefs. The only behavioural change noted among patients without dementia was sleep abnormalities. As the study was hospital based, limited sample size was one of the major limitations. TCBI-R needs to be tested on a larger level, in community based studies, before it can be formally approved.

CONCLUSION

Tamil version of TCBI-R is comparable with the original CBI-R. Efficiency of TCBI-R is same as other screening tools in screening behavioural abnormalities in dementia.

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