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ORIGINAL PAPER

Prevalence and correlates of dementia among the community-dwelling elderly of Guwahati City, Assam

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ABSTRACT

***Background**: Dementia is a major cause of disability in elderly population. But this issue is yet to get due attention and priority. This is mainly due to absence of valid statistics, inadequate documentation and lack of well validated screening tool. There is absolute dearth of information on dementia prevalence among community dwelling elderly in this North East region of the country.Objectives:To assess the prevalence of dementia among community dwelling elderly of Guwahati City and to find out the various correlates of dementia. **Materials and Methods**: This was a community based cross-sectional study conducted in ten (10) randomly selected wards of Guwahati city. Data collection was done by house to house visit after selection of first house randomly. Elderly fulfilling inclusion criteria were screened with vernacular adaptation of Hindi Mini Mental State (HMMSE) and Early Dementia Questionnaire (EDQ).Predesigned and pretested schedule was used to collect information on demographic profile, socioeconomic status, living status, and financial status, type of diet, smoking, use of alcohol and social and leisure engagement. **Results**: The prevalence of dementia on EDQ was found to be 11.25% and 1.25% on HMMSE .Age, gender, socioeconomic status, education, social and leisure engagement was found to be significantly associated with dementia. **Conclusion**: The high prevalence in the present study can be an eye opener for researcher to do further study with larger sample size. This definitely helps the planner for development of effective strategies.*

Keywords:Dementia, Elderly, Early Dementia Questionnaire, Hindi Mini Mental State Examination

INTRODUCTION

With population ageing, dementia becomes an important public health problem, particularly in developing countries. According to the Alzheimer's disease International (ADI) Delphi consensus study, by 2040, 71% of all people with dementia will be living in developing countries. It is estimated that there are about 0 .5 million cases with dementia in India. This number is likely to increase by 300% in the next four decades.[1]

Dementia often goes unrecognised or misdiagnosed in its early stages. In Indian scenario, forgetfulness in the elderly is often recognised as normal variation of ageng. When it is recognised, it is often in advanced stage.[2]However, different studies found that other than loss of memories, the early signs of dementia could also be disturbance of daily functioning, fixation on emotional events and disturbance of day-night rhythm as presentations.[3,4,5]Various tools have been developed for cognitive screening, although no single instrument is suitable for global use.[6] Although Mini Mental State Examination (MMSE) is widely accepted test for cognitive decline,[7] the weakness of the MMSE lies in its varying accuracy in patients of different ages, education levels, and ethnicities.[8,9]So, a Hindi-version of MMSE (HMSE) has been developed for use in India.[10]

Identifying individuals at an early stage of cognitive dysfunction is desirable for both treatment and research purpose.[11] "Early Dementia Questionnaire (EDQ)" is more sensitive tool for detection of early dementia as compared to MMSE.[12]There is absence of information regarding the magnitude of the problem in the North-East region of the

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country. The present study was undertaken to assess the prevalence of dementia and also to study the different factors associated with it.

MATERIALS AND METHODS

This community based cross sectional study was conducted from 1st June 2013 to 30th September'13.Elderly above the age of 60 years and those who were willing to participate were included in the study. Informed consent was obtained from the elderly and also from the caregiver as and when necessary. Subjects included in the study were first screened for depression using 15 Geriatric Depression Scale (15GDS). Elders who were found to score>5 on 15GDS were excluded.Necessary referral was advised for subjects having depression. Severe head injury, brain neoplasm known psychiatric illness, critically ill elderly, and elderly with severe hearing or speech impairment were also excluded from the study. Necessary approval was obtained from Institutional Ethics Committee. As there has been absolute dearth of data from this part of the country and a wide range of variation of prevalence exists across the country, sample size was calculated considering P as 0.5.[13]Applying the formula $4PQ/L^2$, allowable error as 10% of prevalence, the sample size was calculated as 400.From 31 municipality wards of Guwahati city, 10 wards were selected randomly and from each ward 40 elderly were interviewed. The first house in the ward was selected randomly. After that, door to door survey was conducted in the selected ward to identify the residents aged 60 years and above. Face to face interview was conducted for the elderly fulfilling the inclusion criteria. Vernacular adaptation of Hindi Mini Mental State Examination (HMMSE) was used for screening of dementia. This tool was translated to vernacular medium by one bilingual expert and again translated back to Hindi by another bilingual expert and one bilingual investigator compare the two for any discrepancy. This was done to check the integrity of translation. We modified the tool by replacing the questions on villages by the same questions on ward/area. We considered the cut off as less than or equal to 23.Both HMMSE and adopted version were applied to 10 bilingual subjects who were not part of the original study for validation of the tool.Subjects were also administered EDQ.While using EDQ, information was also obtained from an informant, usually the subject's next of kin. This tool was also translated to the local language. Score above 8 on EDQ has been considered as early cognitive decline or early dementia. No attempt was made to assess the type of dementia. A predesigned and pretested schedule was used to collect information on following factors -demographic profile, living status, financial and functional status, type of diet, smoking, alcohol use and social and leisure engagement. Modified Kuppuswamy scale was used for assessment of socioeconomic status. An operational definition of social and leisure engagement was made. Participating in community, religious or social gatherings, engaging in physical exercises/ yoga/meditation, engagement in their hobbies, participating in household activities in their leisure time have been considered as social or leisure engagement. The information obtained from the participants regarding their social and leisure engagement was further verified with the first informant, in case of discrepancy, information was sought from another informant of the family or neighbourhood. Financially independent elders have been defined as those who had one or other means of current income which was sufficient for self -maintenance. Elderly taking vegetarian diet for at least last 6 months were considered as vegetarian and vice versa. For the study purpose, elders have been classified as smokers, non-smokers and ex-smokers. Ex-smokers have been defined as those who have smoked less than 100 cigarettes during their life time and then quitted. For studying the relationship between smoking and dementia, ex- smokers were not considered. Regarding use of alcohol, respondents were categorized as ever user and never user. Ever users were further classified based on frequency of use. The amount and type of alcohol, duration of use were not considered in the study.The elderly who were found to have dementia on HMMSE or EDQ were further advised for diagnostic work-up. Relationship between different variables with dementia was studied. The data collected were subjected for analysis using appropriate methods like Chi-square test and p value.

RESULTS

Table 1 Prevalence of dementia based on EDQ and HMMSE screening tools

SCREENING TOOLS	DEMENTIA(n=400)		PERCENTAGE
	Yes	No	
EDQ	45	355	11.25
HMMSE	5	395	1.25

All the 5 respondents who scored positive on HMMSE were also found to be positive on EDQ(Table 1).

Table 2 Relationship between dementia and certain variables

Variables	Dementia No (%) n=355	Yes (%) n=45	Total	p-value
AGE GROUP				
60-74	329(92.67)	8(17.77)	337(84.25)	
75-84	23(6.47)	32(71.1)	55(13.75)	p=0.000
>85	3(.86)	5(11.1)	8(2)	
SEX				
Female	181(50.99)	33(73.33)	214(53.5)	
Male	174(49.01)	12(26.67)	186(46.5)	p=.005
LIVING STATUS				
Living alone	10(2.82)	1(2.22)	11(2.75)	
With Spouse	33(9.29)	1(2.22)	34(8.5)	
Spouse &Children	228(64.23)	28(62.22)	256(64)	
With Children	84((23.67)	15(33.33)	99(24.8)	p=0.268

EDUCATION				
Illiterate	70(19.72)	14(31.11)	84 (21)	
Primary	49(13.80)	10(22.22)	59(14.75)	
Middle School	28(7.89)	7(15.56)	35(8.75)	
High School	90(25.35)	4(8.89)	94(23.5)	p=0.032
Higher Secondary	53(14.93)	6(13.33)	59(14.75)	
Graduate	48(13.52)	3(6.67)	51(12.75)	
Professional	17(4.79)	1(2.22)	18(4.5)	
SOCIO ECONOMIC STATUS				
Upper	8(2.25)		8(2)	
Upper Middle	11(3.09)	13(28.89)	24(6)	
Lower Middle	131(36.90)	8((17.78)	139(34.75)	p=.0000
Upper Lower	181(50.98)	24(53.33)	205(51.25)	
Lower	24(6.76)	-	24(6)	
FINANCIAL STATUS				
Independent	278(78.3)	35(77.7)	313(78.25)	
Dependent	77(21.7)	10(22.3)	87(21.75	p=0.935
TOBACCO USE				
No	236 (66.47)	23(51.11)	259(64.75)	
Yes	119(33.52)	22(48.89)	141(35.25)	p=0.042
Use of Alcohol				
Non User	268(75.49)	37(82.22)	305(76.25)	
Ever User	87(24.51)	8(17.77)	95(23.75)	p=0.318
Type of diet				
Non-Veg	352(99.15)	34(75.55)	386(96.5)	
Vegetarian	3(0.85)	11(24.44)	14(3.5)	p=0.0000
SOCIAL & RECREATIONAL ENGAGEMENT				
Inadequate	231(65.07)	15(33.33)	246(61.5)	
Adequate	124(34.92)	30(66.66)	154(38.5)	p=0.000

Table 3 Relationship between frequency of alcohol use and dementia

Frequency(n=95)	DEMENTIA		p-value
	NO(%)	YES(%)	
Daily	22(25.28)	0	P=0.021
e”3 times a week	38(43.67)	2(25)	
Weekly	12(13.79)	1(12.5)	
Occasionally	15(17.24)	5(62.5)	
Total	87(100)	8(100)	

Analysis on frequency of alcohol use was found to be statistically significant associated with dementia (P=0.021) **(Table 3).**

DISCUSSION

There is wide variation in prevalence of cognitive decline as well as risk factors from region to region.[14]This variation may possibly be related to adoption of different methodology, screening instruments, defining criteria, multi-ethnicity, multicultural and environmental factors[2] .The prevalence of dementia on EDQ in the present study was somewhat higher than those reported in other studies.[15,16,17,18,19] The prevalence of dementia was found to be 2.4% and 3.6% among urban elderly population in India.[15,18]Studies conducted to see rural-urban comparison in prevalence of dementia in India revealed a lower prevalence in urban area (2.7%) than rural areas (3.5%).[20,21]The higher prevalence of dementia on EDQ in the present study could be attributed to the fact thatEDQ concentrates on recognizing very early symptoms of dementia. Moreover, as information was also taken from the informant, there is less probability of missing early cases. In a study done by Zurrani and his colleagues,prevalence of dementia on EDQ was found to be quite high i.e. 52.3% compared to MMSE (15.5%).[12]Age and gender was two keypredictors of dementia identified by various authors. The findings of significant relationship of dementia with age, education, socio-economic status were consistent with other studies.[16,22,23]However no significant association was found between age, gender and education with EDQ screened dementia in another study.[12]An inverse association between educational level and the risk of AD or dementia has also been reported.[24] In the present study, although no statistically significant association was found between financial status and dementia but the relationship between financial status with dementia is well understood as there is more chance of social interaction and autonomy among the elders in the financially independent group which is indirectly protective against dementia.Living status was not significantly associated with dementia in the present study which is in contrast with other studies.[25] Smoking as a risk factor has been strongly documented in various studies[26,27] which is also observed in the present study. It was noted in the present study that although use of alcohol was not significantly associated with dementia, But frequency of drinking was found to have significant association (p=0.021). Various studies carried out globally noted that light to moderate drinking was associated with significantly lower risk of dementia.[28,29] Smoking and use of alcohol are the lifestyle behaviours that keep changing, so studying their effect as risk factor could be possible only in prospective type of study design. Moreover, the limitation in quantification of the substances in terms amount, duration could be attributed to this non-significant relationship. The finding of significant association between type of diet and dementia is in conformity with other studies.[30.31] Social disengagement has been recognised as a risk factor for cognitive impairment among elderly population.[32,33] Significant association of social and recreational engagementwith

dementia in the present study indicates the need for family and social support in tangible term to make elderly active in their day to day life.

Inability to measure the variables in depth and small sample size were some limitations of the study.

Conclusion: The present study has looked into this unseen problem and highlighted the gravity of the issue. The high prevalence can be an eye opener for further research. The different correlates of the issues need to be addressed effectively.

Conflict of interest: None.

Ethical clearance: Taken from Institutional Ethical Committee.

Author's contribution: We declare that authors named in this article contributed in this study and any liabilities pertaining to the content of this article will be borne by the authors. The contributions were made as: Dr. Anku Moni Saikia: Concept, design, data collection, manuscript writing; Dr. Neelakshi Mahanta: Concept, data collection, manuscript writing; Dr. Ajaya Mahanta: Concept, design; Dr. Himamoni Deka: data collection, manuscript writing and Dr. Beeva Boruah: manuscript writing.

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