

RISK FACTORS OF DEMENTIA AMONG URBAN INHABITANTS OF VARANASI DISTRICT, U.P., INDIA

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Abstract

Background Dementia is a major health problem among elderly. Dementia is an umbrella term for a variety of brain disorders. Symptoms include loss of memory, confusion in taking judgment and making sequencing of reasoning, and changes in mood and behaviour. Several studies showed the prevalence of Dementia which varies between 3 to 8% in urban areas.

Aim The objective of this paper is to find out the significant risk factors for dementia and its distribution among urban inhabitants in Varanasi.

Methodology The study area was neurological centre and its catch up areas. It is a cross-sectional study. Data is collected with pre-designed, pre-tested and structured schedule method. Complete enumeration was done for elderly ≥ 50 years from the study area. To screen the dementia Hindi Mental State Examination (HMSE) was used as the instrumental tool to find out the score of the individual and a cut off score of ≤ 23 was considered as presence of dementia among the study subject. χ^2 test was used to find significant positive association of risk factors with dementia.

Result This study is based on 816 urban inhabitants in the age of ≥ 50 years. The overall prevalence of dementia was observed 3.7% ranging from 2.4% to 14.3% in the age groups of 50-59 and ≥ 80 years respectively. This shows that the prevalence of dementia increases as age increases. The dementia prevalence in urban female was observed 4.6% as compared to male 3.1%. The findings also support that as the educational level increases the dementia percentage decreases. Thus, it is shown that the educational level is highly negatively associated with disease prevalence. The presence of personal habitual variables such as tobacco chewing, smoking, liquor had no significant association ($p > 0.05$) with this morbidity. The associated co-morbidities, e.g., hypertension, diabetes and IHD has no significant association for dementia ($P > 0.05$). The results of binary logistic regression analysis showed that age, marital status and education were found significant independent variables with odds ratio were 2.81 (95% C.I. 1.01-4.72), 2.67 (95% C.I. 1.22-5.84) and 5.10 (95% C.I. 2.43-10.68) respectively. The stepwise binary logistic regression analysis depicts that education was found most significant variable followed by marital status. The value of LR test used at stepwise also showed the significant effect of these variables.

Conclusion In India the size of the elderly population is fast growing although it constituted only 7.4% of total population at the turn of the new millennium, i.e. census 2011. For a developing country like India, this may pose mounting pressures on various socio economic fronts including old age pension outlays, health care expenditures, social discipline, savings levels preparing the programmes etc. This segment of population faces multiple medical and psychosocial problems. There is an emerging need to pay greater attention to ageing-related issues and to promote holistic policies and programmes for well being dealing with the ageing society.

Key Words Dementia, Hindi Mental State Examination (HMSE), Prevalence.

Introduction

Dementia from the Latin word means 'madness' is a serious loss of global cognitive ability in a unimpaired person, from beyond of normal aging. It may be the result of brain injury or progressive, resulting in long-term decline due to damage/disease in the body. Although dementia is more common in the geriatric population but it occurs before the age of 65 that call early onset dementia.

The prevalence of dementia among urban inhabitants of age 60 years and above was 2.7%. and prevalence of dementia was reported to be 3.6% in the urban population of Madras¹. have reported this figure as 3.4% in the rural community of Kerala.³

Among the population of age 55 years and above of a rural community in Northern India, the prevalence rate of 8.4 per 1000 was reported⁴. Considering the magnitude of this problem, it is essential to focus our attention on the burden of this disease in the elderly population, which can make a significant impact on our society.

Objectives

- 1 To determine the burden of dementia among various socio demographic & personal variables.
- 2 To find out the significant risk factors for dementia.

Material and methods

This Study was based on 816 subjects of aged 50 years and above residing in the urban area of Varanasi District of Uttar Pradesh. The data was collected in two phases on the same day. In first phase, a door to door survey was conducted to identify aged ≥ 50 years and to collect the information regarding socio demographic personal variables using cluster sampling on pre-designed and pre-tested schedule. In second phase, Hindi version of Mini Mental State Examination was administered to know the cognitive decline (Ganguli et al., 1995). Chi-square and student t- test were used at 5% level of significance at two tailed test as per their suitability.

Assessment Tool

The study area is Hindi speaking belt and the mostly used common language among the subjects was Hindi and, therefore, the Hindi version of the Mini Mental State Examination (MMSE) developed by the Ganguli et al 1995⁵ was used and their standard was maintained. This Hindi Mental State Examination (HMSE) consists of 22 items which includes different components of intellectual capability. The examination covers several areas of cognitive functioning, such as orientation to time and space, attention and concentration, recognition of objects, language, function, both comprehensive and expressive speech, motor functioning and praxis. It is relatively simple to administer and provides a quick, brief index of the subject's current level of mental functioning. It is a modified version of the

MMSE.⁶ Here, a cut-off score of ≤ 23 was taken to screen the dementia cases, with a sensitivity of 88%, specificity of 82% and with an interrater reliability coefficient of 0.9 as per reported³

Study design`

By applying the cross-sectional/ design, the data were collected in two phases on the same day. During the first phase, all the subjects were thoroughly interviewed by a psychologist and the background information like age, gender, education, and marital status, dietary habits, number of family members, number of earning family members, addiction (tobacco and alcohol) and associated co-morbidities were noted. In the second phase, the HMSE was administered to determine the cognitive decline.

Statistical analysis

The data were entered in the MS Excel software after completion of data collection and scrutiny. The qualitative data was presented in the form of number and percentage. The significant association of dementia with socio-demographic, behavioral and co-morbidity variables was tested by the X^2 test at a 5% level of significance and at the two-tailed test. The relative risk (RR) and 95% CI were calculated for each study variable. The statistical calculation was performed using the Statistical Package of Social Sciences (SPSS), version 16.0.

Results

The result of this study was based on 816 subjects.

Table.1. Association of Socio-demographic variables with Dementia			
SOCIO-DEMOGRAPHIC VARIABLES	HMSE SCORE ≤ 23 No (%)	HMSE SCORE > 23 No (%)	TOTAL No (%)
AGE-GROUP (Yrs)			
50-59	10(2.4)	410(97.6)	420(51.5)
60-69	10(3.9)	246(96.1)	256(31.4)
70-79	7(5.9)	112(94.1)	119(14.6)
80 & ABOVE	3(14.3)	18(85.7)	21(2.5)
Mean (SD)	62.40(10.15)	59.26(8.75)	59.37(8.81)
Range	50-80	50-95	50-95
SEX			
MALE	15(3.1)	476(96.9)	491(60.2)
FEMALE	15(4.6)	310(95.4)	325(39.8)
MARTIAL STATUS			
MARRIED	20(2.9)		682(83.6)
WIDOW/ WIDOWER/ UNMARRIED	10(7.5)	662(97.1) 124(92.5)	134(16.4)

Table.2. Association of Socio-economic variables with Dementia			
SOCIO-ECONOMIC VARIABLES	HMSE SCORE ≤23 No (%)	HMSE SCORE>23 No (%)	TOTAL No (%)
EDUCATION			
UNEDUCATED	16(10.0)	144(90.0)	160(19.6)
JHS	13(2.4)	527(97.6)	540(66.2)
H.S&ABOVE	1(0.9)	115(99.1)	116(14.2)
OCCUPATION			
UNEMPLYD	14(4.4)	307(95.6)	321(39.4)
SELF EMPLYD	10(4.9)	195(95.1)	205(25.1)
EMPLD	2(1.5)	131(98.5)	133(16.3)
RETIRED	4(2.5)	153(97.5)	157(19.2)
FAMILY MEMBERS			
≤5	10(3.1)	309(96.9)	319(39.1)
6-7	5(2.5)	192(97.5)	197(24.2)
8-10	7(4.0)	168(96.0)	175(21.4)
11-15	6(6.5)	86(93.5)	92(11.3)
≥16	2(6.1)	31(93.9)	33(4.0)
EARNING MEMBERS			
1	10(3.3)	293(96.7)	303(37.2)
2	9(3.4)	259(96.6)	268(32.8)
3-4	6(3.2)	184(96.7)	190(23.3)
5-6	4(8.2)	45(91.8)	49(6.0)
≥7	1(16.7)	5(83.3)	6(0.7)

Table.3. Association of Personal habit and co- morbidity with Dementia			
PERSONAL HABITS AND CO- MORBIDITIES	HMSE SCORE ≤23 No (%)	HMSE SCORE>23 No (%)	TOTAL No (%)
DIET			
Vegetarian	21(4.2)	474(95.8)	495(60.7)
Non-Vegetarian	9(2.8)	312(97.2)	321(39.3)
ADDICTION TOBACCO			
YES	8(2.7)	293(97.3)	301(36.9)
NO	22(4.3)	493(95.7)	515(63.1)
SMOKING			
YES	1(1.6)	61(98.4)	62(7.6)
NO	29(3.8)	725(96.2)	754(92.4)
HYPERTENSION			
YES	12(4.3)	270(95.7)	282(34.6)
NO	18(3.4)	516(96.6)	534(65.4)
DIABETIES			
YES	5(3.5)	137(96.5)	142(17.4)
NO	25(3.7)	649(96.3)	674(82.6)

Table.4. Multiple binary logistic regression analysis					
Independent Variable	-2Log likelihood	Sig.	Odds Ratio	95% C.I. for odds ratio	
				Lower	Upper
Age 50-59 60&above	233.012	0.05	Ref. 2.81	0.82	
Marital Status Married Widow/Widower		0.02	Ref. 2.67	1.22	
Education Educated Uneducated		0.000	Ref. 5.10	2.43	

The overall prevalence of dementia was observed to be 3.68%. Further analysis has been performed on all subjects. The distribution of the subjects in the age group 50-59, 60-69, 70-79 and 80 years and above was 51.5, 31.4, 14.6 and 2.5%, with a prevalence of dementia of 2.4, 3.9, 5.9 and 14.3%, respectively, which shows that the prevalence increases with age ($P < 0.05$, Table 1). The percentage gender distribution was 60.2 for males and 39.8 for females, and the prevalence of dementia in males and females was 3.1% and 4.6%, respectively, and there was a significant association between dementia and gender ($P < 0.05$, Table 1). 16.4% of the subjects were

class 5th, then further reduced to 0.9% for high school and onwards [$P < 0.05$, Table 2]. The prevalence of dementia in the unemployed subjects was 4.4% as compared with 4.9% in the self-employed, 1.5% in employed and 2.5% in retired subjects [$P > 0.05$, Table 2]. The total number of members in the family had not significant association with the prevalence of the disease ($P > 0.05$, Table 2), subjects living with family members less than 5, 6-7, 8-10, 11-15 and 16 and more had a prevalence of dementia 3.1, 2.5, 4.0, 6.5 and 6.1%, respectively. The total number of earning members in the family had no significant association with the prevalence ($p > 0.05$, Table 2).

Table.5. Stepwise binary logistic regression analysis						
Step	Independent Variable	-2Log likelihood	Sig.	Odds Ratio	95% C.I. for odds ratio	
					Lower	Upper
1	Education	239.45	0.00	5.10	2.43	
2	Education Marital Status	235.33	0.00 0.03	2.39 4.84	2.64 1.91	

widows/widower and, among them, 7.5% were suffering from dementia as compared with 2.9% among the married subjects, i.e. more than double in widows/ widower ($P < 0.05$, Table 1). This result highlights that persons living without life partner had three times higher prevalence than the married life, thus living with spouse was an preventive measure of dementia.

A continuous pattern of decrease in the prevalence of dementia was observed with increase in the educational level. The prevalence of dementia in the uneducated was 10.0%, which decreased to a significant level of 2.4% for subjects educated up to

The type of diet had no significant association ($P > 0.05$), as Table 3 shows that the prevalence of dementia among vegetarians was 4.2% as compared with 2.8% among non-vegetarians. Tobacco chewing and smoking had no significant association ($p > 0.05$, Table 3). The proportion of subjects with co-morbidities of hypertension and diabetes was 34.6 and 17.4, with prevalence of dementia of 4.3 and 3.5, respectively. These disease had no significant association ($P > 0.05$) [Table 3].

The findings of multiple binary logistic regression analysis have been shown in Table 4 in which only those variables were included which was found

statistically significant at univariate analysis. The above table depicts that age, marital status and education were found significant independent variables for dementia with odds ratio 2.81, 2.67 and 5.10, respectively. Among these variables education status and marital status were observed statistically significant

The results of stepwise binary logistic regression analysis are shown in Table 5. The most significant variable was observed as education status of the subjects with odds ratio 5.10 and 95% C.I. (2.43-10.68). In the next step marital status was found significant variable. The values of LR tests used at stepwise also showed the significant effect of these variables.

Discussion

The extensive studies from developed countries have provided a range of prevalence between 3.8 to 10% in the age- group of above 65 years of age.^{7,8} Very few studies are available from developing countries. Several community based urban and rural studies have been reported on dementia from different part of India, with a varying range of prevalence from 1.02% to 4.86% in the age-group 55-65 years and above.^{1-4,9-12} The findings of our study show that the prevalence of dementia was 3.68%, which was higher in comparison with other Indian studies, but is consistent with other studies of Asian and western countries. In a study found that higher prevalence of dementia of 6.5% among the Kashmiri migrants of age groups 65 years and above.¹³ It was ranging between 8 and 15% in the age-group of 70 years and above. In our study, the prevalence of dementia in female was 4.6 and in male it was 3.1, i.e. prevalence was more in female than that of male, which is comparable with other studies¹³ This may be due to better care given to males as compared with females, as the study area was predominantly a male-dominant society. The marital status also had a significant impact on the prevalence of dementia. Widows/Widower/Unmarried showed more than double prevalence as compared with married life living subjects. This may be due to a better social life in married subjects, although this has not been reported in other studies and needs more evaluation. The prevalence rates among uneducated and educated up to class 5th were 10.0 and 2.4%, respectively in our study. This shows that education, even of primary level, may reduce the prevalence of dementia at a later age. In a pilot study with a Malayalam adaptation of the MMSE, there was no significant difference in the total MMSE scores between the literate and the illiterate.¹⁰ also reported association of low education with dementia.¹² In our study, we also tried to find out an association between dementia and occupation. The prevalence of dementia in unemployed subjects was 4.4% in comparison of 1.5% in the employed. This needs further evaluation. Similarly, an association between

types of family and status of dementia showed a lower prevalence in joint families. This is possibly because of a healthier atmosphere and number of helping members in the family, which strengthens the relevance of Indian culture in the study. This has not been reported in any other study from developing or developed nations. Diet, tobacco chewing, smoking and concomitant diseases had no significant association with dementia.

Conclusions

In joint family, the carrying of each member specially seniors in the family was better as compared to nuclear family because work sharing concept was present among family members, thus they had time to spent leisure time with other family members. In India the size of the elderly population is fast growing. In 2010, there are 3.7 million Indians with dementia and this is expected to double by 2030.¹⁵ for a developing country like India, this may pose mounting pressures on various socio economic fronts including old age pension outlays, health care expenditures, social discipline, saving levels etc. Again this segment of population faces multiple medical and psychological problems. There is an emerging need to pay greater attention to ageing related issues and to promote holistic policies and programs for well basing dealing with the ageing society.

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