



Risk of Dementia Among Urban Elderly Population of Pune, India.

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ABSTRACT

Context : Dementia is strongly associated with aging and is a major public health problem worldwide. It has serious impact on the physical, emotional and economic aspects of lives of the elderly, their families and caregivers. It is a major burden for health sector & economy in developing countries with rapidly aging populations. Mild cognitive impairment (MCI) is a transitional phase between normal aging and dementia. Understanding (MCI) is important, and many cases may progress to dementia if not identified and treated earlier. Objective: To study the prevalence of risk of cognitive impairment and identify associated risk factors among the elderly population in urban area. Methods: 374 elderly subjects of age 65 years and above were selected from urban area and interviewed for risk of cognitive impairment and some risk factors. Results: The prevalence of cognitive impairment risk among the elderly was 13.9%. The significant risk factors were educational status, family type, health problems like diabetes, restriction of daily activities and depression. The insignificant correlates were gender, economic dependence and spouse support. Conclusion: cognitive impairment is a major health problem among the elderly in India and its prevalence is increasing. Severe forms leads to dementia which represents a significant threat for the health and economic sectors. Diagnosing and treating mild cognitive impairment halts progression to dementia. Knowledge of risk factors of dementia may be useful in developing multidimensional strategies to reduce it among elderly. Early diagnostic tools are needed.

KEYWORDS : cognitive impairment, dementia, risk factors

Introduction:

Dementia is a major public health problem among the elderly across the globe. It is strongly associated with aging & has a serious impact on the physical, emotional and economic aspects of lives of the elderly, their families and caregivers. It catastrophically affects the health sector & economy in developing countries whose population is aging rapidly. It is estimated that the number of people living with dementia will almost double every 20 years to 42.3 million in 2020 and 81.1 million in 2040. The most remarkable effects of population aging are expected in the most rapidly developing regions such as China, India and Latin America¹. In 2010, the total global societal cost of dementia was estimated to be US\$ 604 billion. This corresponds to 1.0% of the worldwide gross domestic product (GDP). It is one of the important public health priority conditions in the WHO Mental Health Gap Action Programme (mhGAP), which aims to scale up care for mental, neurological and substance use disorders².

Dementia is a syndrome usually of a chronic or progressive nature in which there is deterioration in cognitive function. Cognitive impairment is when a person has trouble remembering, learning new things, concentrating, or making decisions that affect their everyday life³. Cognitive impairment ranges from mild to severe. The boundaries between different forms of dementia are indistinct and mixed forms often co-exist. Mild cognitive impairment (MCI) is a transitional phase between normal aging and dementia. With mild impairment, people may begin to notice changes in cognitive functions, but still be able to do their everyday activities. Understanding (MCI) is important, and many cases may progress to dementia if not identified and treated earlier⁴. Very few studies on MCI have been carried out in India⁵. Keeping in view of all these facts, it was decided to screen the elderly population in the Urban field practice area of a Medical College & General Hospital in Pune for risk of cognitive impairment. The Objective of the study was to study the prevalence of risk of cognitive impairment in the elderly population aged 65 yrs and above and identify the associated risk factors.

Material and Methods:

After obtaining institutional ethical committee approval a cross sectional study was planned and the inclusion criteria was all the persons 65 years of age and above, permanent resident as per the voter's card and who gave consent for the study. The total 65 and above elderly present in the study area was 1707 which is 4.7% of the adult electoral population. Males of age 65 and above were 956 (56%) and females of age 65 and above were 751 (44%) of the total elderly of 65 and above in the study area. Sample size of 374 was calculated assuming psychological morbidities prevalence of 42%⁶ with alpha error of 5% & confidence level of 95%. Stratified random sampling method was used to conduct the study. Stratification was done on the basis of gender and proportionate representation of males and females of 65 and above was done in the study sample from the sampling frame of 65 and above elderly obtained from voters list. Thus 210 males and 164 females were included in the study. The selection of the subjects was done using lottery method. The data collection tool was a questionnaire and it had two parts. The first part had sociodemographic history and the second part was made of clinical examination details of study subjects along with three scales. The diagnosed cases of diabetes with reports and/or undergoing treatment were included as cases of diabetes. Geriatric depression scale 15 (GDS 15)⁷ was used to screen for depression. The mobility of the elderly was tested using Barthel scale for activities of daily living (ADL)⁸ & mini mental state examination scale (MMSE)⁹ was used to screen for cognitive impairment. MMSE scale which has the sensitivity of UPTO 90% and specificity of 87% was used for screening purpose to identify risk of cognitive impairment. MMSE Score from 21 to 24 has mild risk & score from 10 to 21 has moderate risk. Score 9 or less has a severe risk for cognitive impairment & score of 25 and above has been identified as normal. Morbidity was expressed in percentage & Chi square test was used as a test of significance. P value of 0.05 and less was considered as statistically significant. Epi info software 7.1.2.0 was used for sample size calculations and statistical analysis.

Results :

In all 52 (13.9%) persons were found to have risk of cognitive impairment by MMSE 23(44%) were males and 29(56%) were females. 42(11%) elderly had mild risk & 9(2%) had moderate risk . One elderly was seen to suffer form severe form of cognitive impairment. Among the 55 diagnosed diabetic elderly study subjects 18 were found to having cognitive impairment. The elderly screened positive for depression were 73 & 26 among those were found to be at risk of cognitive impairment. The loss of mobility was assessed by Barthel scale & it showed 17 elderly at risk of cognitive impairment among the 40 elderly found to be dependent on the family members for activities of daily life.

Table no 1 shows the association of sociodemographic variables and the risk of cognitive impairment. The statistically significant relationship was seen with variables like age, literacy level, type of family, depression, diabetes and physical mobility. The table no.2 shows the relative contribution of various variables with the risk of cognitive impairment after application of multiple logistic regression model. In the present study age is the only variable which has been found out to be strongly associated with the risk of cognitive impairment in regression analysis.

Discussion:

The prevalence of cognitive impairment was 13.9% among the elderly in our study population. About one in seven of the elderly being affected by cognitive impairment is a cause of concern. In the present study the prevalence of mild cognitive impairment is considerably higher as compared with the moderate and severe forms. Similar results have been reported by various investigators from India^{10,11,12,13,14}.

Among the 52 affected elderly in the present study, 42(81%) of the elderly are found to be suffering from milder form of cognitive impairment which is many times not revealed and neglected by themselves as being part of aging. Ignorance about mild cognitive impairment is present on the part of the family members as well as on part of family physicians also. This leads to misdiagnosis of this condition which becomes severe as age advances. So it is very essential that the condition should be diagnosed at the earlier milder level to halt the disease progression & control the associated morbidities. Other studies also show similar results^{5,10}.

In the present study increasing age was found to be statistically significantly associated with cognitive impairment risk (x2=93.01,d.f=1,P <0.0001). Increasing age casues aging changes in all systems of the body which is compounded by adverse social events. This finally manifests by various grades of depression & cognitive impairment in the elderly. Similar findings were seen by other investigators. ^{10,13}.

In the present study literacy status was found to be statistically significantly associated with cognitive impairment risk (x2=7.73,d.f=1,P =0.01). Other studies also showed similar association.^{10,13}

In the present study type of family was seen to significantly associated with the cognitive impairment risk (x2= 6.4,d.f=2,,P=0.04),.Other studies reported similar findings. ^{10,13}

In the present study diabetes was found to be statistically significantly associated with cognitive impairment risk (x2=33,d.f=1,,P <0.001). Other studies also show similar results.^{5,11}

In the present study depression was found to be statistically significantly associated with cognitive impairment risk (x2=33.5,d.f=1,,P <0.001). Other studies also show similar results^{11,14} In the present study loss of mobility measured by activities of daily living (ADL) was found to be statistically significantly associated with cognitive impairment risk (x2=33.77,d.f=2,,P <0.001). Other studies also show similar results.¹²

In the present study female gender, economic dependence and loss of spouse support was not found to be statistically significantly associated with cognitive impairment risk. The table no 2 shows after multiple logistic regression analysis age is the only variable which has significant risk associated with the of development of cognitive impairment. Aging leads to multiple changes in all the systems of the body including neuronal degeneration and death. These senile

changes associated with adverse life events impacts the psychological wellbeing of the morbid elderly subjects. This biological plausible change has been clearly brought out in this study. It has been proven by various other investigators across the globe.

Conclusion:

There is limited data and research available on the topic of cognitive impairment and the sever forms of dementia. The topic needs to be explored further and there is immense need of raising awareness among the medical fraternity about easy tools for screening & diagnosing cognitive impairment cases at the earliest possible time. Diagnosing and treating adequately the mild cognitive impairment is surely a preventive tool for the medical and socioeconomic complications for the patient and the family.

Table No 1: Association Of Socio-demographic Variables & Dementia Risk (N=374)

Risk factors	Dementia risk frequency (n=52)	Df	X2 Val-ue	P Value	Interpre-tation
AGE					
65-70	0	1	93.01	<0.000	Highly Signifi-cant
71-75**	29				
76-80	17				
80 +**	6				
GENDER					
Male	23	1	2.94	0.08	Not Sig-nificant
Female	29				
SPOUSE SUP-PORT					
Yes	28	1	1.55	0.21	Not Sig-nificant
No	24				
FAMILY TYPE					
Nuclear	14	2	6.4	0.04	Signifi-cant
3-Genera-tion***	16				
Joint***	22				
ECONOMIC DEPENDENCE					
Yes	46	1	0.0	0.9	Not Sig-nificant
No	6				
LITERACY STATUS					
Illiterate	47	1	7.73	0.01	significant
Literate	05				
Diabetes					
Yes	18	1	33	0.00	Highly Signifi-cant
No	34				
Depression					
Yes	26	1	33.5	0.00	Highly Signifi-cant
No	26				
ADL					
Dependent	35	1	119	0.000	Highly Signifi-cant
Independent	17				

** - rows combined as <75 and 75> for analysis , *** - rows combined as nuclear and non nuclear families for analysis

Table No. 2 : Multiple Logistic Regression Analysis Of Risk Factors

Variable	Odds Ratio	95% C.I.	Coeffi-cient	S.E.	Z-Stat-istic	P-Value	
Age	1.8573	1.5487	2.2274	0.6191	0.0927	6.6784	0.0000
De-pression Status	3.0917	0.9033	10.5814	1.1287	0.6278	1.7980	0.0722
DM	2.4270	0.7000	8.4149	0.8866	0.6344	1.3977	0.1622
Econ-omic De-pend-ence	1.0867	0.2967	3.9801	0.0832	0.6623	0.1256	0.9001

Family Type	1.3307	0.7209	2.4560	0.2857	0.3127	0.9136	0.3609
Gender	0.8949	0.3514	2.2788	-0.1111	0.4769	-0.2329	0.8159
Literacy Status	0.5229	0.1338	2.0436	-0.6484	0.6955	-0.9323	0.3512
Spouse Support	1.2783	0.5151	3.1727	0.2456	0.4638	0.5295	0.5965
Barthels Scale ADL	0.4286	0.0974	1.8865	-0.8472	0.7561	-1.1205	0.2625
Con-stant	*	*	*	-47.3656	6.8349	-6.9299	0.0000

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