Prevalence of Dementia & it's association with modifiable risk factors in Elderly Veterans attending Geriatric Opd in a Tertiary care centre

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INTRODUCTION

Worldwide around 50 million people live with dementia, and this number is projected to increase to 152 million by 2050, rising particularly in low-income and middle-income countries (LMIC) where around two-thirds of people with dementia live.[1] Dementia affects individuals, their families, and the economy, with global costs estimated at about US$1 trillion annually.[1]

In India, geriatric population was 6.0% in 1991 to 8.3% in 2013 [2] with unique health care needs due to a higher prevalence of chronic non-communicable diseases and other neuro psychiatric disorders as compared to adult population [3]. Overall, a growing body of evidence suggests the nine potentially modifiable risk factors [4] for dementia - lack of education, hypertension, hearing impairment, smoking, obesity, depression, physical inactivity, diabetes, and low social contact. They are associated with 35% of the population attributable fraction (PAFs) [4,5]of dementia worldwide and are modelled on the 2017 *Lancet* Commission on dementia prevention, intervention, and care. The country-specific prevalence of the nine potentially modifiable risk factors indicate PAF of 40% in China, 41% in India [5]. Therefore, a higher potential for dementia prevention exists in these countries.

Recently three more risk factors [6] for dementia with newer, convincing evidence have been studied. These factors are excessive alcohol consumption, traumatic brain injury (TBI), and air pollution. Together the 12 modifiable risk factors [6] account for around 40% of worldwide dementias, which have a potential to be prevented or delayed. The potential for prevention is high and might be higher in low-income and middle-income countries (LMIC) where more dementias occur. Early-life (younger than 45 years) risks, such as less education, affect cognitive reserve; midlife (45–65 years), and later-life (older than 65 years) risk factors influence reserve and triggering of neuro-pathological developments

Various terms have been employed to characterize the cognitive decline associated with aging, including benign senescent forgetfulness, age-associated memory impairment, and age-associated cognitive decline [7]. The term mild cognitive impairment (MCI) is intended to represent an intermediate stage between normal aging and the development of pathologic aging and dementia [8].

Of the normal memory functions, some decline substantially with increasing age, and some do not. *Memory functions that remain relatively stable with increasing age include the following*:

- *Semantic memory* - Facts and general knowledge about the world; although this function generally remains stable with age, especially if the information is used frequently, [9,10] retrieval of highly specific information (eg, names) typically declines.
- *Procedural memory* – Acquisition and later performance of cognitive and motor skills [9,10]

Memory functions that decrease with age include the following:

- *Working memory* - Holding and manipulating information in the mind, as when reorganizing a short list of words into alphabetical order [9,10,11], verbal and visuo-spatial working speed, memory, and learning, with visuo-spatial cognition more affected by aging than verbal cognition
- *Episodic memory* – Personal events and experiences [9]
- *Processing speed* [11]
- *Prospective memory* – The ability to remember to perform an action in the future (eg. remembering to fulfil an appointment or take a medication [11].
- *Ability to remember new text information, to make inferences about new text information, to access prior knowledge in long-term memory, and to integrate prior knowledge with new text information* [12,13]
- *Recollection*

To demonstrate that a patient's cognitive function is worse than would normally be expected for his or her age, neuropsychological testing is necessary so that the patient's performance can be compared with that of an age-matched (and, ideally, education-matched) control group. In any case, the defining element of MCI, as postulated by Petersen, is a single sphere of slowly progressive cognitive impairment that is not attributable to motor or sensory deficits and to which other areas of involvement may eventually be added, before social or occupational impairment supervenes (because this occurrence marks the onset of dementia).

Identifying cognitive impairment early reduces the burden to the patient as well as the care givers. In the light of the above considerations this study is proposed to screen the cognitive impairment in Elderly Veterans in a Geriatric clinic at a tertiary care centre.

AIMS AND OBJECTIVES

1) To screen for cognitive impairment and determine the prevalence of Dementia among Elderly Veterans attending geriatric clinic.
2) To assess the socio demographic factors and the 12 Modifiable Risk factors responsible for cognitive impairment among these patients.

MATERIALS AND METHODS

Study design -The present cross sectional study will be conducted on geriatric patients who were 60 years and above, attending geriatric clinic at MH Jalandhar, Jalandhar cantt. 100 patients from OPD will be included in this study will be conducted for a period of six months from Jan'2022 till June '2022.

Inclusion criteria

Patients who are 60 years and above. Those who are willing to give informed written consent

Exclusion criteria

1. Those who are disabled to participate due to major medical co-morbidities. Those who refuse to give consent.
2. More than 2 comorbidities
3. Any patient who is on anti-psychotics, anti-depressants and anti-cholinergics.
4. CKD,CLD patients
5. Patients with acute confusional states, Delirium , Metabolic encephalopathy.

Each study subject will be subjected to a series of tests using a pretested, pre-structured study questionnaire after completion of physical assessment by physician and all the information regarding socio-demographic profile, present physical health status and problems and mental abilities (cognitive status) were collected. Few measurements (e.g.: Blood pressure measurement) were taken to know the current health status of the study subjects.

Assessment of cognitive functions

The following scales were used to screen cognitive impairment;

1. **Hindi mental status examination**: HMSE was developed by Mary Ganguli and Graham Ratcliff et al. is a widely used cognitive screening scale to assess dementia in elderly.

Mild cognitive impairment	Moderate	Severe
24-20	15-19	<15

A score of less than or equal to 24 is regarded as mild cognitive impairment. In a study on 100 illiterate elderly subjects, the Hindi MMSE was 94% sensitive and 98% specific.

2. **Everyday ability scale for India**: EASI is developed by Fillenbaumg and Chandra et al. consists of an 11 item questionnaire that addressed personal care, mobility, social interaction and cognitive functioning. On this 11 item scale, a point is scored for each item in which a disability is reported, thus a higher score reflects greater impairment [14].

EASI Score <5 means	Less impairment
EASI Score > 5 means	Greater impairment

3. **Huchinski ischemic score**: The Huchinski Ischemic Scale was developed by Huchinski. It is a tool widely used to identify a likely vascular component once a dementia diagnosis has been established. It is not itself a validated diagnostic tool. A score greater than 7 suggests vascular involvement [15].

HIS Score < 7 indicates	No vascular involvement
HIS Score >7 indicates	Vascular impairment

STATISTICS

The data obtained will be analysed with the statistical package for social sciences software (SPSS) V24. Chi square /Fischer exact test will be done to find out the significance between the 12 modifiable risk factors and cognitive impairment.

A p value < 0.05 will be taken as strongly significant.

MS Word and Excel will be used for generating graphs and data tables.

RESULTS

A total of 100 Geriatric patients aged 60 years and above of both sexes are evaluated in this study. Socio demographic features of the patients are shown below

Table 1: Socio demographic features of the patients

Age Distribution	Number of patients	Percentage %
Age 60-75 76-90	69 31	69% 31%
Sex distribution		
Male	42	42%
Female	58	58%
Place distribution		
Rural (AQI < 50 ,Good)	40	40%
Urban (AQI > 90 ,Moderate)	60	60%
Educational qualifications		
Post graduate	3	3%
Graduate	10	10%
Senior secondary school(12th)	30	30%
Less than 10 yrs of school		
	57	57%
Marital status		
Married	80	80%
Widowed	15	15%
Divorced	5	5%

Table 2: Risk factors for dementia

SI No	Variables	Dementia (%)	No Dementia (%)	OR (95% CI)	p value
1.	Age				
	60-75	6	63	0.1732	
	76-90	11	20	(0.056-0.5279)	0.0020
Sl No	Variables	Dementia (%)	No Dementia (%)	OR (95% CI)	p value
2	Sex				
	Male (n=42)	3	39	0.2418	
	Female (n=58)	14	44	(0.064-0.904)	0.03
3	Education				
	> 10 yrs of schooling (n=43)	3	40	0.2304	
	< 10 yrs of schooling (n=57)	14	43	(0.0616-0.8616)	0.0292
4	Living alone				
	Yes (n=20)	5	15	1.88	0.2
	No (n=80)	12	68	(0.5783-6.169)	
5	Tobacco				
	Yes (n=60)	7	53	0.3962	
	No (n=40)	10	30	(0.1366-1.1490)	0.088
7	Alcohol(>60g/d)				
	Yes (n=54)	14	40	5.0167	0.0166
	No (n=46)	3	43	(1.3412-18.7647)	
	Depression				
8	Yes (n=70)	10	60	0.5476	
	No (n=30)	7	23	(0.1862-1.6108)	0.2740
	Co- Morbidities				

Sl No	Variables	Dementia(%)	No dementia(%)	OR (95% CI)	p value
9.	**Hypertension** **Yes** (n=46)	**16**	**30**	**28.266**	
	No (n=54)	**1**	**53**	**(3.5691-223.8642)**	**0.0016**
10.	**Diabetes mellitus** **Yes** (n=45)	**8**	**37**	**1.1051**	
	No (55)	**9**	**46**	**(0.3882-3.1458)**	**0.85**
11.	**Physical activity** **Sedentary** (n=56)	**09**	**47**	**17.800**	**0.049**
	Active (n=44)	**0**	**44**	**(1.0061-314.918)**	
Sl No	Variables	Dementia(%)	No dementia(%)	OR (95% CI)	p value
12.	**Traumatic brain injury** **Yes** (n=6)	1	5	0.9750	
	No (n=94)	16	78	(0.1066-8.9184)	0.981
13.	**Low social contact** **> 4 Get-togethers in a month** (n=66)	7	59	0.2847	
	< 4 Get-togethers in a month (n=34)	10	24	(0.0971-0.8353)	0.0221
14.	**Exposure to air pollution** **Yes** (AQI > 90 Moderate) (n = 60)	4	56	0.1484	0.0020
	No (AQI < 50 ,Good) (n= 40)	13	27	(0.0442-0.4980)	
15.	**Obesity**				
	Yes (n=30)	3	27	0.4444	
	No (n=70)	14	56	(0.1177-1.6785)	0.2317

As evident in Table 2, Dementia is significantly associated with risk factors like age, Female sex, Education, Alcohol intake, Hypertension, Sedentary lifestyle, Low social contact and Exposure to air pollution.

DISCUSSION

Our study clearly showed that 17% of the geriatric patients had cognitive impairment. Besides cognitive impairment was found to be high in females when compared to males. The reason may be attributed to difference in the literacy rates & socio-economic status. The present study also revealed that there is an inverse relationship between cognitive impairment and lower educational status. (among cognitively impaired, 57% of patients did less than 10 years of schooling). The present study also revealed that there is an inverse relationship between the HMSE Score vs. EASI Score and HMSE Score vs. HIS Score. Increasing age, female sex and hypertension were found to predict cognitive impairment in the current study.

The limitation of our study stems from the fact that it was a cross sectional study hence, causal association between the socio demographic and cognitive impairment cannot be inferred.

CONCLUSIONS

As the world ages, cognitive impairment will become an important public health problem. Proper control of the modifiable risk factors will go a long way in delaying

Cognitive impairment. Given the findings of our research, we suggest that screening for elderly patients for cognitive impairment is must.

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