Research Article

A Cross-Sectional Study of Cognitive Impairment and Morbidity Profile of Inmates of Old Age Home

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Abstract: The population of elderly is growing globally and so are the physical illness and cognitive impairment. This study was planned to assess the prevalence of cognitive impairment and pattern of physical morbidity and association between cognitive impairment and physical morbidity. The study was conducted in Gold-age old age home in Saroor nagar, Hyderabad in between Feb 2014-April-2014. The elderly subjects 50 were selected by simple random sampling technique and assessed on MMSE, MINI plus, GHQ, GDRS. The prevalence of cognitive impairment among inmates of old age home was found to be 38%. Cognitive impairment was associated with age (p value=0.024), female sex (p value=0.426), low socioeconomic status(p value=0.469), less education (p value=0.04), nuclear family (p value=0.06), widow, unmarried status (p value=0.627). Cognitive impairment was associated more with GDRS scores (p value=0.022), less with medical morbidities like diabetes (p value =0.40), hypertension (p value=0.236). Medical morbidities were more common among oldest old age group, female gender, urban domicile. Most common medical morbidity was hypertension (25%), diabetes (20%) and arthritis (15%). Finally, it can conclude that Geriatric clinics can improve the health and mental status of the elderly population by screening to detect the morbidities early and creating the awareness in them.
Keywords: Elderly people, Old age homes, Cognitive disturbances

INTRODUCTION

The world experienced rapid expansion of elderly population in last century. The advancement in medical sciences has increased life expectancy of individual by providing quality health care and better nutrition. The proportion of older adults in less developed countries is rising much faster than in developed countries [1]. The life expectancy of an average Indian has increased from 36.7 in 1951 to over 67.14 in 2012 [2]. Also the population of older adults (more than 60 yr) in India increased to 102 millions in 2011 [3]. Urbanisation, modernisation and globalisation have changed the traditional concept of family in India, which was to provide social support to ill, dependent and older family members [4. Over the years, urbanisation has lead to change in the economic structure, diminishing societal values, weakening the importance of joint family. In this changing scenario older generation is caught between the decline in traditional values and absence of social security [5]. As a result elderly adults are forced to take shelter in old age homes [6]. The overall prevalence of mental and behavioural disorders tend to increase with age due to normal ageing of brain , deteriorating physical health and cerebral pathology [7]. Disorders such as depression, anxiety, cognitive disorders have a high prevalence in this segment of population [8]. A study reported prevalence of psychiatric morbidity in community dwelling rural older adults as 23.7%, of which mood disorders was the commonest followed by mild cognitive impairment, Alzheimer's disease, vascular dementia [9]. Shaji *et al*. reported 3.36% dementia in elderly aged 65 yrs and above in urban areas of South India [10]. Studies in the West have demonstrated advancing age along with higher cognitive and functional impairment as predictors of entry in to old age homes [11]. This study was undertaken to determine prevalence of cognitive impairment, sociodemographic factors, physical morbidity pattern of inmates of old age home.

Aim and Objective
- To study the prevalence of cognitive impairment of elderly adults in old age home
- To study the association between sociodemographic variables and cognitive impairment in old age home.

- To study the association between cognitive impairment and physical morbidity.
- To study the number and type of physical morbidities among inmates of old age home.

MATERIALS AND METHODS
Type of study
Cross-sectional study

Type of sample
The study sample was selected from two branches of Gold age old age home in Saroor nagar Hyderabad .The study was conducted from 23rd March to 23rd May 2014, subjects were selected by simple random sampling technique. In old age homes, the subjects on every alternate bed of dormitory was interviewed , when the candidate on a particular bed did not meet the criteria to be included in the study the candidate on next alternate bed was assessed .Elderly adults were defined as those aged 60years and above.

Inclusion criteria
- Age above 60years
- Give consent and cooperative
- Not having speech and communication defects
- Who have been staying in old age home for more than 6 months

Exclusion criteria
- Age below 60years
- Did not give consent and not cooperative
- Having speech and communication defects
- Who have been staying in old age home for less than 6 months

Method
The size of the sample was 50 comprising of 20males and 30females. The authorities in charge of the home for aged where the study was conducted were contacted and prior permission was obtained. After obtaining consent each person was interviewed on sociodemographic data sheet. Then all those included in the study were screened for psychiatric morbidity using GHQ-30 [12] those who scored more than 11 were subjected to MINI plus [13] for assessment of axis-I disorders. Mini mental status examination (MMSE) [14] was done to assess cognitive impairment in all inmates, who scored less than 24 were assessed for organic brain disorders using MINI plus. Geriatric depression rating scale (GDRS) [15] was administered to all inmates to screen and assess severity of depression.

Modified Kuppuswamy scale [16] was used to assess socioeconomic status. For assessing physical morbidities in the inmates, qualitative information like prescriptions and test reports as well as their own explanations were taken in to account. All the participants were categorised in to three sub categories

-young-old; 60-69years; old-old; 70-79; oldestold; 80years and above [17]. The data was then analysed.

Statistical analysis
Data has been analysed using Statistical Package for Social sciences (SPSS) version 10.0 for Windows .Intra group data are described as means and percentages .Quantitative data between groups were analysed using Chi-square test .Statistical significance was set at p value 0.05.

GHQ [12]
Goldberg general health questionnaire is available in 60, 30, 24, 12, 6 and 5 items. For the current study 30 item version with a cut-off score 11 has been used.

MINI international Neuro Psychiatric interview plus [13]
MINI plus (13) is a structured diagnostic interview developed by Sheehan for diagnosing Psychiatric disorders as per DSM-IV and ICD-10 diagnostic criteria.

MMSE [14]
Folstein Mini Mental Status examination is a 30 point cognitive test to provide a bedside assessment of cognitive function, a cut off of 24 for identifying cases of dementia has been suggested.

GDRS [15]
Geriatric depression rating scale is a 30 item scale was used to assess severity of depression.

Modified Kuppuswamy scale [16]
The most widely used scale for assessment of socioeconomic status in urban population. It is a composite score of education, occupation of head of the family along monthly income of family which yields a total score of 3-29.This scale classifies the study population in to high, middle and low socioeconomic status.

RESULTS
There were more elderly adults in young old (60-69) age group (56%), more females (60%) than males 40%), more elderly from middle (48%) and low SES (44%). More elderly had their family of origin as nuclear type (70%) before joining old age home (70%) of elderly adults were widows, unmarried single, separated from their spouse (Table 1).

Cognitive impairment increased with age, from 28.56% in 60 – 69 age group to 40% in 70 – 79 age group to 100% in 80 and more age group (p=0.024*). Cognitive impairment was also significantly associated with educational status 70% of elderly with mild cognitive impairment and 100% of elderly with moderate cognitive impairment were either illiterates or educated upto primary school. (p=0.04). Cognitive impairment was more common in female gender (52.9

%) middle and low socio economic status (88%), urban domicile (70.6%) and nuclear family (70.6%) but the association was not statistically significant. (Table – 2)

Among elderly adults having mild cognitive impairment, nine elderly adults were found to have hypertension, two elderly adults with moderate cognitive impairment were found to have hypertension, but the association was not statistically significant (p value = 0.236) (Table 3a).

Out of 17 elderly adults with mild cognitive impairment 11 were found to have diabetes. Two elderly with moderate cognitive impairment with diabetic association was not significant (p value = 0.408). (Table - 3b)

GHQ scores were found to be higher in those with mild and moderate cognitive impairment (13.88 and 13.00) than those without cognitive impairment (9.74) and the association was statistically significant by ANOVA (p=0.021*) (Table 4a)

GDRS scores were high in patients with mild and moderate cognitive impairment. Mild, moderate cognitive impairment were significantly associated with GDRS scores (p =0.02*) by ANOVA – indicating that there may be overlap between mild cognitive impairment and depression (Table 4b).

The study findings shows that all the inmates (100%) were suffering from medical morbidity, multiple morbidities were found in 46% of young old age group, 21% of old old age group and 66.67% of oldest old age group.

Multiple morbidities were more common among females (40%), two morbidities were more common among males (50%)

Single morbidity was more common among rural population (43.47%), multiple morbidity was more common among urban population (53.54%) (Table 5).

In the study population most common medical morbidity was hypertension (25%, diabetes (20%) and arthritis (15) and others (40%).

More number of females was found to have medical morbidities like hypertension (51.25%), diabetes mellitus (55.56%) and arthritis (58.82%) than males. (Table-6)

Table 1: Showing sociodemographic profile of inmates of old age home

		n = 50	**%**
Age	60-69	28	56%
	70-79	19	38
	>80	3	6%
Gender	Male	20	40%
	Female	30	60%
Religion	Hindu	40	80%
	Christian	9	18%
	Muslim	1	2%
Domicile	Rural	23	46%
	Urban	27	54%
Education	Illiterate	12	24%
	School	30	60%
	College	8	16%
Marital Status	Married	15	30%
	Unmarried	35	70%
	Widow		
	Single		
	Separated		
Socio Economic Status	Upper	4	8%
	Middle	12	24%
	Lower Middle	12	24%
	Upper Lower	12	24%
	Lower	10	20%
Occupation	Retired	7	14%
	Pvt. Employee	1	2%
	Housewife	23	46%
	Businessman	10	20%
	Farmer	6	12%
	Labourer	3	6%
Type of family	Joint	15	30%
	Nuclear	35	70%

Table- 2: Showing socio demographic factors of inmates having mild and moderate cognitive impairment.

		Mild Cognitive impairment (n=17)	Moderate Cognitive impairment (n=2)	Chisquare	p vale
Age	60-69	8(47.1%)	0 (0%)	11.192	0.024*
	70-79	7(41.2%)	1 (50%)		
	> 80	2 (11.8%)	1 (50%)		
Gender	Male	9(52.9%)	2(100%)	1.708	0.426
	Female	8(47.1%)	0 (0%)		
Literacy Education	Illiterate	1(5.9%)	2 (100%)	9.943	0.04*
	School	11(64.7%)	0(0%)		
	College	5 (29.4%)	0 (0%)		
Socio Economic Status	Upper	2(11.8%)	0 (0)%	3.556	0.469
	Middle	9(52.9%)	0 (0%)		
	Lower	6 (35.3%)	2 (100%)		
Domicile	Rural	5 (29.4%)	1 (50%)	2.871	0.238
	Urban	12(70.6%)	1 (50%)		
Type of family	Joint	5 (29.4%)	2 (100%)	5.611	0.06
	Nuclear	12 (70.6%)	0 (0%)		
Marital Status	Married	5 (29.4%)	0	0.935	0.627
	Unmarried	12 (70.6%)	2 (100%)		
	Widow				

Table 3a: Showing association between medical morbidity and cognitive impairment.

	Medical morbidity HTN		Total	Chisquare	p vale
	+ve	-ve			
Mild cognitive impairment (MMSE 20 - 24)	10 (58.82%)	7 (41.18%)	17 (100%)	2.890	0.236
Moderate cognitive impairment (MMSE 10 - 19)	2 (100%)	0	2 (100%)		

Table 3b: Showing association between medical morbidity and cognitive impairment

	DM		Total	Chisquare	p vale
	+ve	-ve			
Mild cognitive impairment (MMSE 20 - 24)	11 (63%)	6 (37%)	17 (100%)	1.791	0.408
Moderate cognitive impairment (MMSE 10 - 19)	2 (100%)	0	2 (100%)		

Table 4a: Showing association between GHQ and cognitive impairment by ANOVA:

Cognitive impairment	n = 50	GHQ Scores	F	p value
Mild	17	13.88	4.215	0.021*
Moderate	2	13.00		
Nil	31	9.7419		
	50	11.28		

Table 4b: Showing association between GDRS scores and cognitive impairment by ANOVA

Cognitive impairment	n = 50	GDRS Scores	F	p value
Mild	17	12.5880	4.124	0.022*
Moderate	2	8.41		
Nil	31	5		
	50	11.28		

Table 5: showing number of medical morbidities a cross age, gender and domicle

		1 morbidity (13)	2 morbidity (20)	3 morbidity (17)	Total n=50
Age	Youngold 60-69 yrs	5 (17.85%)	10(35.714%)	13(46.43%)	28
	Old Old 70-79 yrs	7(36.84%)	8(42.91%)	4 (21.05%)	19
	Oldest old >80 yrs	1 (33.33%)	2 (66.67%)	-	3
Gender	Male	5(25%)	10(50%)	5(25%)	20
	Female	8(26.64%)	10(33.33%)	12(40%)	30
Domicile	Rural	10(43.47%)	5(21.73%)	8(34.77%)	23
	Urban	3(11.1%)	15(53.54%)	9(33.33%)	27

Table 6: Showing distribution of medical morbidities across both genders of inmates of old age home

| Medical Morbidity	Male (n=20)	Female (n=30)	Total
Hypertension	14(48.75%	15 (51.25%)	29
Diabetes mellitus	12 (44.44%)	15 (55.56%)	27
Arthritis	7 (41.17%)	10(58.82%)	17
Fractures	2 (50%	2 (50%)	4
Cataract	4 (28.57%)	10 (71.43%)	14
CAD	2 (66.66%)	1 (33.33%)	3
Renal	2 (50%)	2 (50%)	4
Prostate	4(100%)	-	4
Gynecological problems	-	1 (100%)	1
Cancer	-	4(1005)	4
Neurological (Paraplegia,Hemiplegic)	2 (25%)	6 (75%)	8
Dental	-	3 (100%)	3
Hernia	1 (100%	-	1
Thyroid	0	1 (100%)	1
	50	**70**	**120**
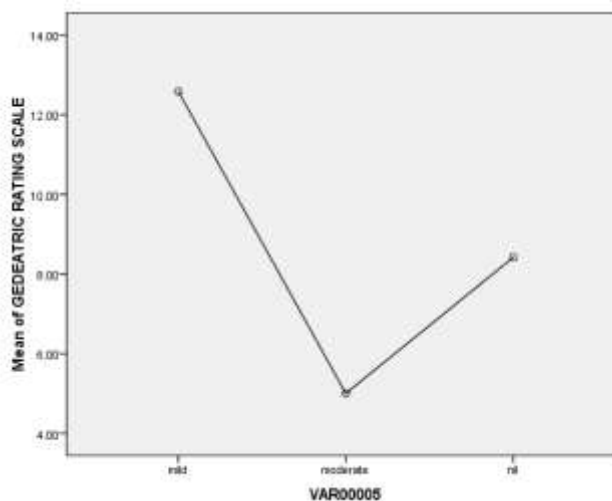
Fig. 1: Graph showing association between GDRS scores and cognitive impairment
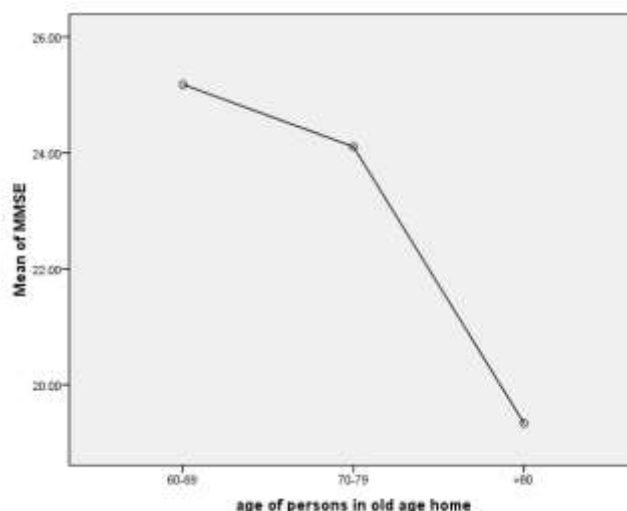
Fig. 2: Graph showing association between age of inmates and MMSE scores : With increasing age mean MMSE scores decrease.

DISCUSSION

The present study attempted to find out the prevalence of cognitive impairment among the inmates of old age home in Hyderabad. The cognitive impairment was found in 38% (19 inmates) (cognitive impairment was defined as MMSE score less than 24). Mild cognitive impairment (MMSE score between 20-24) was found in 34%, (17 inmates), moderate cognitive impairment (MMSE score 10-19) was found in 4% (2 inmates). 30 % (5 inmates) out of 34% inmates with mild cognitive impairment, 100% (2 elderly) with moderate cognitive impairment met criteria for dementia as per MINI -plus. Prevalence of dementia was found to be 14% .Our study also found psychiatric morbidity in 30% of which depression was found in 26%,(53.76% had mild depression, 46.72% had severe depression as per GDRS), 2%anxiety disorders,2% psychosis as per MINI-plus.

In a study by Tiwari on psychiatric morbidity in old age homes cognitive impairment was second highest (45%) [18]. Tipple found prevalence of dementia was 9.52% in old age homes [19]. In other Indian studies prevalence of dementia has been reported as 0.1% in West Bengal, 4.9% in Kerala, 0.8% in Vellore [20-22]. This variability of prevalence of dementia in India may be due to sample size, age of subjects, instruments used for assessment and diagnostic criteria ,place where the study was carried out. Recent studies suggest that over half of residents of old age home have some degree of dementia [23, 24]. Relation ship of Cognitive impairment and Sociodemographic factors: Prevalence of cognitive impairment increased with age from 7.13% in young old age group to 25% in old old age group to 100% in oldest old age group (p value -0.024). It is well known that prevalence of dementia increases two times every five years [25]. Cognitive impairment was found to be significantly associated with illiteracy and primary school education (p value-0.041). Apart from increased

age, literacy other factors associated with cognitive impairment in this study are female gender (p value=0.426), marital status (p value=0.627), low socioeconomic status (p value=0.469), nuclear family (p value=0.06), urban domicile (p value=0.238). It will be interesting to examine their interaction in determining the course and outcome of dementia. This is comparable to study by Seby [26] which says that factors associated with dementia were not having spouse, nuclear family, low socioeconomic status. Relationship between Cognitive impairment and Physical morbidity: 59.8% of elderly adults with mild cognitive impairment were found to have Hypertension, but the association was not statistically significant (p value =0.236). 63% of elderly with mild cognitive impairment were diabetic but the association was not significant statistically (p value=0.408) Relationship between Cognitive impairment and GDRS scores: Our study found a statistically significant association between GDRS scores and mild and moderate cognitive impairment.(p=0.022).Mild Cognitive impairment found in inmates may actually be a manifestation of depression.

Hence elderly having mild cognitive impairment will have to be screened for depressive symptoms and treated accordingly. Medical morbidity in old age homes: All the inmates suffering from one or multiple medical morbidity, none of them reported themselves healthy (100%). Multiple health problems were more among higher age groups as compared to younger aged(66.67% had multiple morbidities in oldest old group). Multiple morbidities were more common among females (40%) than males (25%). This is in line with study done in Lucknow stated that all the inmates suffered from single or multiple physical problems and majority of them having multiple physical problems (males=60%, females=68%) [18]. Multiple morbidity was more common among inmates who hail from urban background (53.54%), may be because

urban people suffer from lifestyle problems more often than rural. This is in contrast with study by Joshi, Avasthi [27] which says that multiple morbidity was more common in rural elderly adults. Most common health problem among inmates of old age home was hypertension (25%), diabetes (20%) and arthritis (15%) and others (40%). The most common morbidity pattern was higher among females than males. Similar findings were observed in the study done on morbidity profiles of elderly in old age home in Chennai which showed hypertension (39.5%), diabetes (20.5%), hearing problems (17%) [28].

CONCLUSION
- The prevalence of cognitive impairment among inmates of old age home was found to be 38% (mild-34%, moderate-4%).
- The risk factors for cognitive impairment as per current study was oldest old age group, female gender, low socio economic status, rural domicile, less education, nuclear family, unmarried /single status.
- GDRS scores were significantly high in inmates with mild cognitive impairment indicating the possibility of pseudo dementia in those inmates.
- Elderly with cognitive impairment were also to a lesser extent associated with diabetes; hypertension is a pointer towards the possibility of vascular dementia.
- Multiple medical morbidities were found in oldest-old age group (66.67%), female gender (40%), urban domicile (53.54%).
- Most common medical morbidity was hypertension (25%), diabetes (20%), and arthritis (15%).

Drawbacks of our study
- Small size of sample so cannot be generalised.
- For assessing cognitive impairment longitudinal study is ideal, ours is across sectional study.
  Future direction: Cognitive impairment may be because of depression, or vascular cause: Geriatric clinics can be helpful in early diagnosis of Cognitive impairment and create awareness in elderly population.

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