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Original Research Article

An assessment of functional limitations and its relation to morbidity pattern among the elderly residing in urban area, Kerala, India

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ABSTRACT

Background: Ageing is an inevitable process and a person aged 60 years or above is often referred to as 'elderly'. Older age is characterized by emergence of several complex health states that tend to occur only later in life and that do not fall into discrete disease categories. These are commonly called as geriatric syndromes. The aim of the study was to estimate the prevalence of functional limitations among the elderly and to determine the association between functional limitations and morbidity pattern among the elderly residing in urban area in Ernakulam district, Kerala.
Methods: A community-based cross-sectional study was carried out among 302 elderly participants by using cluster sampling technique in two urban areas of Ernakulam. The structured questionnaire included socio-demographic details, diagnosed morbidities and modified Barthel index to assess functional limitations.
Results: The overall prevalence of functional limitations was 22.4% among the elderly. Functional limitations were significantly associated with acid peptic diseases, constipation, kidney disorder, urinary tract infection, arthritis/joint pain, visual impairment, senile deafness and edentulous mouth.
Conclusions: In our study 22.4% of the elderly had some form of functional limitations in terms of difficulties in performing basic ADL. Association of functional limitations and different type of morbidities were found in acid peptic diseases, constipation, kidney disorder, urinary tract infection, arthritis/joint pain, visual impairment, senile deafness showed statistically significant. Individuals who had edentulous mouth was also found to be statistically significant.

Keywords: Elderly, Functional limitations, Morbidity pattern

INTRODUCTION

Ageing is a universal and inevitable phenomenon, and it affects every individual, family, community and society.[1] It is a normal, progressive and irreversible process leading to functional deterioration, vulnerability to illnesses and ultimately culminating in extinction of life. Elderly or old age consists of ages nearing or surpassing the average life span of human beings. According to World health statistics 2014, globally around 11% of the population is above 60 years of age, and 8% of population is above 60 years of age in India.[2] However, a person ≥60 years is referred to as 'elderly' in India. Now India has acquired the label of 'an aging nation' with the contribution of elderly population to demographic figures increasing day by day.[3] As age advances there is deterioration of many organs and system leading to increase in risk for various diseases. Older age is characterized by emergence of several complex health states that tend to occur only later in life and that do not fall into discrete disease categories. These are commonly called as geriatric syndromes.[4] Some of the reasons are genetic origin and others are exposure to behavioural health risks such as smoking, alcohol consumption, poor diet, a sedentary lifestyle or toxic substances at work also influences outcomes in elderly population.[5] Common

conditions in elderly includes hearing loss, visual problems, arthritis, hypertensions, diabetes and respiratory problems. They are often the consequences of multiple underlying factors and includes frailty, urinary incontinence, falls, and dementia. The early detection of these diseases and intervention to correct these can reduce disability, hospitalization and mortality.

With this background, a study on functional limitations was undertaken among the elderly population in Ernakulam district of Kerala. The aim of the study was to estimate the prevalence of functional limitations among the elderly and determine the association between functional limitations and morbidity pattern among the elderly.

METHODS

This study was a community based cross-sectional study conducted among the elderly population aged ≥60 years residing in urban areas of Ernakulam district, Kerala. The study was done over a period of 5 months (15th January to 15th June 2021). The study was approved by the Institutional Scientific Committee and Ethics committee of the institution. The sample size was calculated using the formula:

$$N = \frac{(1.96)^2 pd}{d^2}$$

where the Prevalence (p) were taken 34.1% as per the study done by Das et al, where q=65.5% and absolute error 20% with 95% confidence interval, after applying the design effect of 1.5, the minimum sample size was 279. A cluster sampling technique was used to select the study subjects from Kochi Corporation and Kalamaserry Municipality. In Cochin co-operation, there are 74 divisions and 5 administrative zones among them 5 divisions were randomly selected while in Kalamaserry municipality, there are 39 wards among which 5 wards were randomly selected for the study. After obtaining informed consent from the participants data was collected. House-to-house visits was done. Total number of houses visited were 362, after excluding non-respondents and locked homes, 302 participants were included in the study. Structured questionnaire was used for data collection. It included basic socio demographic details; morbidities were recorded by using the shared documents which showed previously diagnosed by a registered medical practitioner. Modified Barthel scale was used to measure the performance in activities of daily living and showed the degree of independence of a person. It covers 10 domains of functioning activities with the score ranging from 0 to 20. The data collected was tabulated using MS excel. Statistical analysis was performed using SPSS 20.0 software. Statistical association between functional limitations and morbidities was assessed using chi-square. To predict the most significant risk factors of functional limitations, multivariate logistic regression analysis was performed. A p value of <0.05 was considered to be statistically significant.

RESULTS

Socio-demographic profile

Majority of the respondents were in the age group of 60-69 years (49%) and about (62.9%) were females. Most of the individuals were married (65.9%) and (33.8%) were widows. It was also observed that most of the individuals were unemployed (49%) and (45.7%) were retired, only (5.3%) of the individuals were employed. It was found majority of individuals were from nuclear family (75.5%) and (24.5%) were from joint family. According to social habits, (4.6%) of the individuals were smokers and (4.3%) were alcoholic (Table 1).

Association of morbidities and functional limitations among the elderly

This study was able to reveal that many diseases were associated with functional limitations among the elderly. The common diseases are acid peptic disease (p≤0.001), constipation (p<0.001), kidney disorder (p≤0.001), urinary tract infection (<0.001), arthritis/joint pain (0.048), visual impairment (<0.001), senile deafness (p≤0.001) and edentulous mouth (p≤0.001) were found to be highly statistically significant (Table 2).

Regression analysis to predict the risk factor of functional limitations

The result of multivariate logistics regression analysis showed that most significant predictor of functional limitations were edentulous mouth (p value<0.001, OR=14.644, CI=4.234-50.651), acid peptic disease (p value=0.003, OR=10.559, CI=1.171-95.203), kidney disorder (p value=0.007, OR=9.944, CI=1.859-53.201), and visual impairment (p value=0.036, OR=3.240, CI=0.947-11.086) (Table 3).

Table 1: Distribution of elderly according to their socio-demographic profile.

Characteristics	Frequency N=302	Percentage (%)
Age (years)		
60-69	148	49
70-79	115	38
80 and above	39	13
Sex		
Male	113	37.4

Continued.

Characteristics	Frequency N=302	Percentage (%)
Female	189	62.9
Marital status		
Single	1	0.3
Married	199	65.9
Widow	102	33.8
Religion		
Hindu	189	62.2
Muslim	63	20.7
Christian	50	16.7
Occupation		
Unemployed	148	49
Employed	16	5.3
Retired	138	45.7
Education		
Illiterate	14	4.6
Primary school completion	30	9.9
Middle school completion	80	26.5
High school certificate	56	18.5
Bachelor's degree	94	31.1
Postgraduate	25	8.3
PhD	3	1.0
Type of family		
Nuclear	228	75.5
Joint	74	24.5
Social habits		
Smoking		
Yes	14	4.6
No	228	95.4
Alcohol consumption		
Yes	13	4.3
No	289	95.7

Table 2: Association of morbidities and functional limitations among the respondents.

Types of morbidities	Functional limitations				P value
	Yes (N)	%	No (N)	%	
Number of morbidities					
1	0	0	9	100	0.262
2 to 3	13	18.2	146	91.8	
≥4	17	12.7	117	87.3	
Type 2 diabetes mellitus					
Yes (150)	17	11.5	133	88.7	0.419
No (152)	13	8.6	139	91.4	
Hypertension					
Yes (223)	24	10.8	199	82.2	0.555
No (79)	6	7.6	73	92.4	
Thyroid disorder					
Yes (48)	41	85.4	7	14.6	0.240
No (254)	23	9.1	231	90.1	
Respiratory disorders					
Yes (38)	7	18.4	31	81.6	0.610
No (264)	23	9.1	241	91.3	
Acid peptic disease					
Yes (17)	6	35.5	11	67.7	<0.001
No (285)	24	8.4	261	91.6	
Constipation					
Yes (39)	10	25.6	29	74.4	<0.001

Continued.

Types of morbidities	Functional limitations				P value
	Yes (N)	%	No (N)	%	
No (263)	20	7.6	243	92.4	
Kidney disorder					
Yes (12)	5	41.7	7	58.3	<0.001
No (290)	25	8.6	265	91.4	
Urinary tract infection					
Yes (26)	8	30.8	18	69.2	<0.001
No (276)	22	8	245	92	
Anaemia					
Yes (7)	0	0	7	100	0.803
No (295)	30	10.2	265	89.8	
Arthritis/joint pain					
Yes (247)	29	11.7	218	88.3	0.048
No (55)	1	1.8	54	98.2	
Visual impairment					
Yes (195)	29	14.9	166	85.1	<0.001
No (107)	1	1	106	99.1	
Senile deafness					
Yes	24	18	109	82	<0.001
No	6	3.6	163	96.4	
Cancer					
Yes (10)	3	30	7	70	0.105
No (292)	27	9.2	265	90.8	
Dental conditions					
Edentulous	26	24.5	80	75.5	<0.001
Dentulous	4	2.1	192	97.9	

Note: *p value<0.05 is considered to be statistically significant.

Table 3: Multivariate logistic regression analysis among the respondents.

Risk factor for functional limitations	B	Wald	P value	OR	95% for OR	
					Lower	Upper
Edentulous (present)	2.684	17.970	<0.001	14.644	4.234	50.651
Acid peptic disease (present)	2.225	8.896	0.003	9.254	2.144	39.933
Kidney disorder (present)	2.297	7.206	0.007	9.944	1.859	53.201
Visual impairment (present)	2.357	4.413	0.036	10.559	1.171	95.203

Note: *p value<0.05 is considered to be significant.

DISCUSSION

In our study 22.4 % of the elderly had functional limitations similarly (22%) in a community-based study from rural Tamil Nadu done by Rao et al. Another community based study from West Bengal using ADL scale, 16.16% elderly persons were found functionally disabled done by Chakrabarty et al A community-based study from urbanised village, New Delhi were the prevalence of functional disability of 25.4% done by Vaish et al found slightly higher than our study.[6,7] Padda et al observed in their study that most common morbidity was joint pain/ joint stiffness 60.6%.[8] Arthritis/joint pain is common in elderly as there is weakening of musculoskeletal system leading to poor mobility which further lead to dependent life among elderly. In our study hypertension 73.8% much higher than Rafiq et al where prevalence was found to be 37.3%.[9] The prevalence of type 2 diabetic mellitus was 49.7% as compared to Kaur et al, the prevalence was 11.6% among the elderly which was much higher in our study.[10] Thyroid disorder was 15.8% in our study which was higher as compared to Das et al found only 1.6% of the elderly had thyroid disorder. Constipation was found to be 12.9% in our study whereas comparable results from similar study settings were reported by Sengupta et al where constipation was found 11%.[1,11] Respiratory disorder was seen in 12.6% among the elderly in our study was less than Hameed et al. Visual impairment was found to be 64.1% in our study which is almost similar to the study conducted by Hameed et al 62.9% whereas Karmakar et al showed the prevalence of impaired vision was 36%.[3,5,12] Senile deafness in the current study was 44% was much higher as compared to the study conducted by Qadri et al in which the prevalence showed 24.5%. Urinary tract infection found to be 8.6% in our study was higher than Das et al.[1,12] Our study also revealed that 34.6% of the elderly were having edentulous mouth. In other study, it was observed that 10.4% of the elderly had edentulous mouth conducted by George et al.

Morbidities such as acid peptic diseases, constipation, Visual impairment, senile deafness, kidney disorder and arthritis were associated with functional limitations was found to be statistically significant but there was difference in a study conducted in North India by Joshi et al showed that elderly participants with higher morbidity had increasing disability.[13,14]

Limitation

As diagnostic procedures were not done to detect diabetics, hypertensions and other diseases so it may not give a correct estimate for all types of morbidities.

CONCLUSION

Our study was a community based cross sectional study conducted among the elderly in urban areas of Ernakulam District, Kerala. 22.4% of the elderly had some form of functional limitations in terms of difficulties in performing basic ADL. Association of functional limitations and different type of morbidities were found in acid peptic diseases, constipation, kidney disorder, urinary tract infection, arthritis/joint pain, visual impairment, senile deafness showed statistically significant. Individuals who had edentulous mouth was also found to be statistically significant. Awareness among the elderly population should be created for regular medical check-ups to ensure prevention and early detection of chronic diseases. Further studies with more methodological rigor should be conducted for deeper insight into relations between the factors identified in this study and disability for developing more effective public health actions.

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