

Morbidity Pattern Among The Geriatric Population In South India: An Observational Study

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DOI: <https://doi.org/10.24321/2455.7048.201803>

Abstract

Introduction: India, the second most populous country in the world is expected to have an increase in geriatric population of 37% by 2051. Along with the rise in geriatric population there is also a rise in geriatric related morbidity which requires special attention and care.

Methods: This was a community-based study, consisting of house to house survey of all people aged 65 years and above in Ernakulam district. Residents of Ernakulam district who are ambulant and above the age of 65 years formed the study population of this study. Subjects aged 65 years and above were selected for the study using multi stage stratified random cluster sampling method. A total of 1000 samples were collected.

Results: Among the 1000 study subjects, 342(34.2%) were diabetic 768(76.8%) were hypertensive and 248(24.8%) were suffering from dyslipidemia. Hypertension (76.8%) followed by visual impairment (59.4%) and knee pain (56.5%) were the most common comorbidities in the present study population.

Conclusion: The incidence of all the study parameters among the elderly population was very high in comparison with studies from other parts of India. A substantial impact on this burden, unique preventive health care strategies specific to the elderly need to be clearly formulated and tested.

Keywords: Geriatrics, Old age, Morbidity, Kerala

Introduction

India, the second most populous country, in the world also has approximately 76.6 million people at or over the age of 60, constituting above 7.7% of total population. The aged in Kerala constitute 11% of the population as compared to 7.7% in India. Their population, which was 9% in 1991, is expected to increase to 37% by 2051.¹ This rise in geriatric

population is the result of demographic transition and healthcare developments in the country. But along with the rise in geriatric population, there is also a rise in geriatric-related morbidity, which requires special attention and care.

The Kerala Aging Survey (KAS), conducted among participants aged 60 to over 100 years, showed that joint pains, forgetfulness, sleep problem, lack of energy, etc.,

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How to cite this article: Divyamol KS, Lalu JS, Vijayakumar P et al. Morbidity Pattern Among The Geriatric Population In South India: An Observational Study. *Epidem Int* 2018; 3(1): 11-17.

are the most often reported morbidity. Common chronic illnesses among the elderly in Kerala are diabetes, heart disease, high blood pressure, and arthritis.³

The cost of healthcare could rise with increasing need for care and support in the geriatric population. A state like Kerala, where the life expectancy is longer than the national average, will need a suitable health policy for the older population. Therefore, we need to enrich the knowledge regarding predominant health problems among the geriatric age group. Being a witness to many geriatric patients in the OPD with multiple comorbidities, a study was conducted with an aim to find out the prevalence of major chronic and disabling conditions among the elderly in Ernakulam district in Kerala.

Methods

This was a community-based study, consisting of house-to-house survey of people aged 65 years and above in Ernakulam district, spanning an area of 3068 sq. km situated in the central part of the state of Kerala in South India. This study was done within a radius of 10km from the study site, i.e., Amrita Institute of Medical Sciences, Kochi, during a period of one year. This area included 12 Panchayats, 4 Municipalities and 1 Corporation.

Residents of Ernakulam district, who were ambulant and above the age of 65 years, formed the study population of this study. Patients who were bedridden and those who were completely dependent for their basic activities of daily living (BADLs) were excluded from this study.

This paper is based on the baseline data of a cohort study conducted in Ernakulam. Sample size for this study was calculated based on a study conducted by Lawlor et al. titled, "Association between falls in elderly women and chronic drug use: A cross-sectional study," where the prevalence of falls was reported as 16.9%. The sample size was estimated to be 472 by selecting an alpha of 0.05 ($\alpha=0.05$) and an allowable error of 20%.⁴

Subjects aged 65 years and above were selected for the study using multi-stage stratified random cluster sampling method. Since this study adopted cluster sampling, the obtained sample size was multiplied by design effect. Design effect for cluster sampling was calculated using cluster size ($k=25$) and intra-class correlation (ICC, 0.023) giving us an inflation factor of 1.552. The design-adjusted sample size was estimated to be 732. Anticipating loss of subjects during follow up, the final sample size adjusted to 1000.

From the defined study setting, 40 clusters were selected from a geographical area of up to 10km radius from the study site (Amrita Institute of Medical Sciences, Kochi). In each cluster, a random starting point was selected and households were visited in a sequential manner until 25 subjects fulfilling the inclusion criteria were included in the study. In each household, the interview was conducted by the principal investigator and a trained staff.

An informed consent was taken from each participant before the questionnaire was administered. This study was approved by the Institutional ethics committee.

Results

The baseline characteristics of the study population are as shown in Table 1. Most of the participants 648(64.8%) were in the age group 65–74 years.

The study population consisted of 568(56.8%) females. Amongst the participants, 343(34.3%) had a normal BMI and 85(8.5%) were obese.

Most of the participants were literate 829(87.8%) with 657(65.7%) having at least middle school education. The study area consisted of mainly urban areas, 706(70.6%) of the participants and the remaining 294(29.4%) were from the rural parts of Ernakulam.

Most of the participants 854(85.4%) have been involved in physically active occupations in the past.

Table 1. Distribution of Baseline Characteristics of the Study Population

S. No.	Variable	Frequency (%) (n=1000)
1.	Age	
	65–74	648(64.8%)
	75–84	262(26.2%)
	>=85	90(9.0%)
2.	Sex	
	Male	432 (43.2%)
	Female	568 (56.8%)
3.	BMI*	
	Underweight	122(12.2%)
	Normal	343(34.3%)
	Over weight	450(45.0%)
	Obese	85(8.5%)
4.	Educational level	
	Graduate and above	134(13.4%)
	Diploma/predegree	87(8.7%)
	Middle school (5th–10th)/Primary school(till 4th)	657(65.7%)
	Illiterate	122(12.2%)
5.	Past occupation	
	Sedentary	146(14.6%)
	Physically active	854(85.4%)
6.	Study distribution	
	Urban	706(70.6%)
	Rural	294(29.4%)

*BMI – Body mass index

Comorbidity Profile

The comorbidity profile of the study population is presented in Table 2. Of the 1000 study subjects, 342(34.2%) were diabetic, 768(76.8%) were hypertensive, and 248(24.8%) were suffering from dyslipidemia. The participants who reported as having asthma, COPD and CAD were 122(12.2%), 106(10.6%) and 201(20.1%) respectively.

In the study population, 388(38.8%) complained of occasional vertigo. Of the participants, 316(31.6%) had

urinary complaints such as urgency, increased frequency, nocturia, dribbling of urine, and poor-stream of urine.

Visual impairment was reported in 594(59.4%) of the study population. The number of participants who had knee pain was as high as 565(56.5%). Among the local problems in the feet, major complaint was weakness of the lower limbs, 383(38.3%) followed by 76 (7.6%) who complained mainly of paresthesia and numbness of the feet.

Table 2. Distribution of Comorbidity Profile of the Study Population

S. No.	Comorbidity	Male N (%)	Female N (%)	Frequency (%) (n=1000)
1.	Hypertension	320 (74.1)	448 (78.9)	768(76.80%)
2.	Visual impairment	237 (54.9)	357 (62.8)	594(59.4%)
3.	Knee pain	182 (42.1)	383 (67.4)	565(56.5%)
4.	Vertigo	133 (30.8)	255 (44.9)	388(38.8%)
5.	Diabetes	151 (35)	191 (33.6)	342(34.2%)
6.	Urinary symptoms	135 (31.2)	181 (31.9)	316(31.6%)
7.	Arthritis	75 (17.4)	206 (36.3)	281(28.1%)
8.	Constipation	113 (26.2)	171 (30.1)	284(28.4%)
9.	History of fall in the preceding 1 year	48 (11.1)	221 (38.9)	269(26.9%)
10.	Dyslipidemia	101 (23.4)	147 (25.9)	248(24.8%)
11.	Hearing impairment	109 (25.2)	143 (25.2)	252(25.2%)
12.	CAD*	101(23.4)	100 (17.6)	201(20.1%)
13.	Alcohol	169 (39.1)	008 (1.4)	177(17.7%)
14.	Smoking	172 (39.8)	006 (1.1)	178(17.8%)
15.	Postural hypotension	56 (13)	102 (18)	158(15.8%)
16.	Asthma	56 (13)	66 (11.6)	122(12.2%)
17.	COPD**	47 (10.9)	59 (10.4)	106(10.6%)
18.	CVA***	23 (5.3)	30 (5.3)	53(5.3%)
19.	Psychiatric illness	05 (1.2)	11 (1.9)	16(1.6%)
20.	Movement disorder	06 (1.4)	9 (1.6)	15(1.5%)
21.	Parkinsonism	06 (1.4)	8 (1.4)	14(1.4%)
22.	Problems of the feet	143 (33.1)	240 (42.3)	383(38.3%)
	Weakness of lower limb			
	Paresthesia, Numbness			
	Amputation of toes/foot			
	Corns			
	Sores	2 (0.5)	2 (0.4)	4(0.2%)

*CAD – Coronary artery disease, **COPD – Chronic obstructive pulmonary disease, ***CVA – Cerebrovascular accident

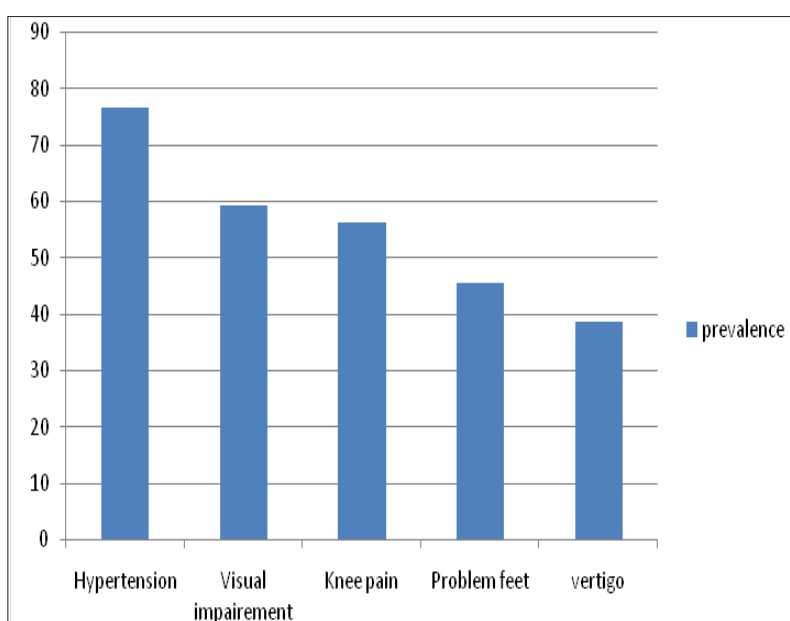


Figure 1. Most Common Morbidities among the Study Population

Figure 1 shows the common morbidities among the study population. Hypertension (76.8%) followed by visual impairment (59.4%) and knee pain (56.5%) were the most common comorbidities in the present study population. Among the male geriatric population in this study, we found that hypertension was the most common comorbidity followed by Visual impairment.

physically active (84.4%). Studies conducted in Kerala on elderly population also found that prevalence of morbidity was more among females and that Kerala has the highest prevalence of morbidity as compared to all India levels.⁵⁻⁷The female predominance in all these studies may be due to the longer survival rate among females as compared to males in Kerala. The longer life expectancy among the

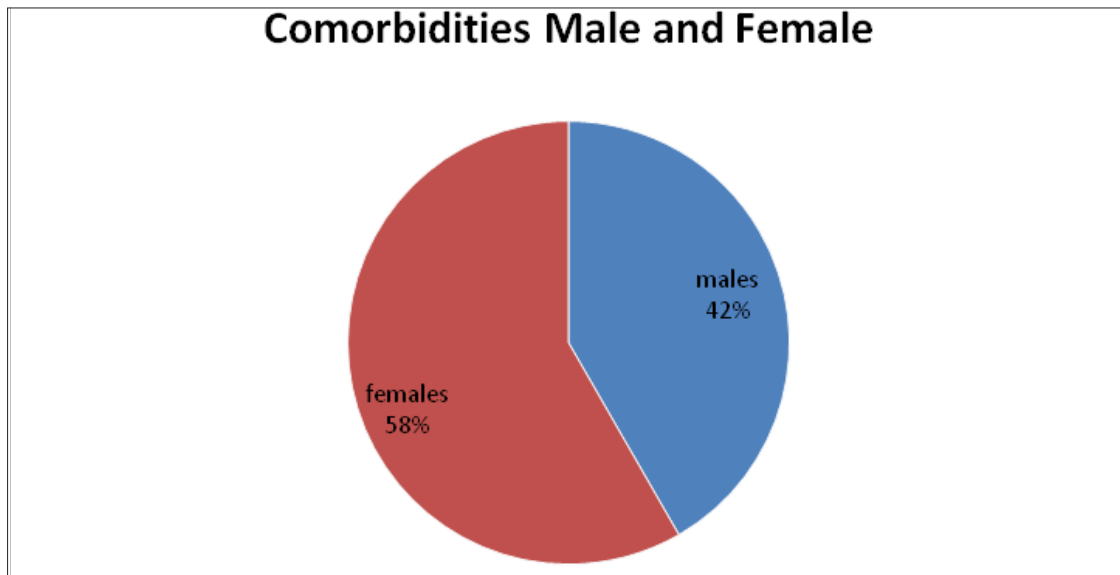


Figure 2. Distribution of Comorbidities among Gender

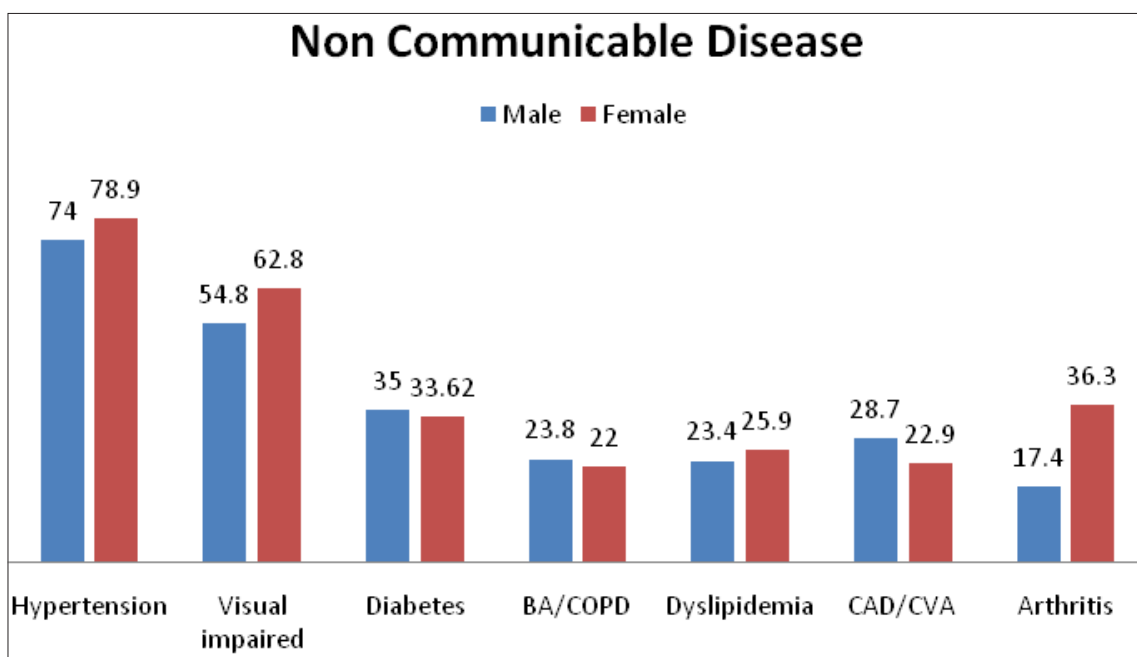


Figure 3. Percentage of Non-communicable Disease Burden

Discussion

Our study population seems to be predominantly females (56.8%) and majority (64.8%) of the study population belonged to the age group of 65–74 years. The present study found that about 98% of the study population suffered from at least one comorbidity. Majority of the subjects were literate (87.8%), lived in urban area (70.8%), and were

females makes them more prone for comorbidities as compared to the male counterparts.

The common health issues identified in our study population were knee pain and arthritis (84.6%), hypertension (76.8%), visual impairment (59.4%), problems of the feet (48%), vertigo (38.8%), Urinary symptoms (31.6%), and CAD (23.4%). Habits such as alcohol intake (17.7%), tobacco

smoking (17.8%) were more prevalent among males whereas all other comorbidities were reported to be more among the females.

Studies conducted in different settings in south India showed varied pattern. A study conducted by Shraddha et al. found that visual problems followed by hypertension and diabetes were the most common comorbidities among the elderly in Mysore.⁸ Another study conducted in Tamil Nadu reported that visual Impairment was the single most common morbidity followed by joint pain and arthritis and the third commonest morbidity being dental problems. Whereas, elderly in Puducherry showed high prevalence of visual problems (68.2%) and anemia (86%).¹⁰

In the high range part of north India, most common morbidities among the geriatric age group were musculoskeletal problems.¹¹⁻¹³ Also, in Gujarat, a study shows that musculoskeletal problems are commonly reported problems followed by visual problems and hypertension.¹⁴ However, a study conducted by Joshi et al. in Haryana, reports higher prevalence of anemia followed by dental problems.¹⁵ In Udaipur, Prakash et al. found that visual problems were the most prevalent comorbidities among the aged population.¹⁶

Higher prevalence of hypertension, visual impairment, arthritis and dyslipidemia was found among elderly females in our study. Similar findings were reported in a study conducted by Bharathi et al. among elderly females in Puducherry.¹⁰ A study conducted in Chennai reported higher prevalence of comorbidities among males with less than three comorbidities, whereas higher prevalence was noted among females in the category with more than three comorbidities.¹⁷ Except for respiratory diseases, other non-communicable diseases were comparatively more prevalent among females in most of the studies across different settings in India.^{12,14,16} This gender-based pattern may be influenced by the post-menopausal hormonal effect among the females. The protective effect of estrogen against arthritis and other non-communicable diseases wanes off post menopause.¹⁸ Males were found to be commonly using tobacco smoke, which make them more prone for respiratory diseases.

Strength of the Study

This study identified an increasing requirement for nationwide determinations to develop various surveillance programs to identify the increasing geriatric health problems.

Limitation of the Study

This study has several limitations. First, the sample was small and was drawn from one geographical area. So, the results cannot be generalized to national populations.

Second, this study design has limited extrapolative value. Lastly, researchers in this field are troubled with recall bias pertaining to age-related amnesia and other psychological problems.

Future Directions of the Study

Holistic researches are needed on all dimensions of geriatric health, including psychosocial and social security standings of morbidity. A new trend has to be set for sensitizing the personnel working in the field of geriatrics through awareness classes and conferences across the country.

Conclusion

The incidence of all the study parameters among the elderly population was very high in comparison with other studies from other parts of India and even previous studies of Puducherry. This highlights the increasing trend of burden of geriatric health problems in south India. For a substantial impact on this burden, unique preventive health care strategies specific to the elderly needs to be clearly formulated and tested.

Conflict of Interest: None

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Date of Submission: 2018-02-22

Date of Acceptance: 2018-02-26