Morbidity pattern and its relation to functional limitations among old age rural population in Kerala, India

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Abstract

Background: In the present era of demographic transition, morbidity pattern among geriatric population and its relation to functional limitations is an important health issue in developing countries. Objective: The objective of this study was to assess the reported morbidities and its relation to functional limitations among rural geriatric population. Materials and Methods: A community-based cross-sectional study was carried out among 167 old age participants aged ≥60 years to assess morbidities and its relation to functional limitations in a rural area of Kerala, India. Sociodemographic details, blood pressure, diabetes, visual impairment, and other reported diagnosed morbidities were assessed by interview using structured pro forma. Functional limitations for activities of daily living were assessed by 10-item Barthel index scale. Results: Overall prevalence of any morbidity was 89.2% (149/167) and moderate or severe functional limitation was 9% (15/167). One morbidity was reported by 34.1% (57), two morbidities 24% (40), three or more 31.1% (52) of the participants. Most common morbidities include hypertension (63, 37.7%), diabetes and visual impairment (61, 36.5% in each), joint pains or backache (51, 30.5%). Age group was significantly associated with joint pain/backache and visual impairment while gender with diabetes, hypertension, and chest diseases. Higher functional limitation is significantly more among those with joint pain or backache (P < 0.05). Among those with moderate and severe functional limitation, majority (12, 80%) had ≥3 morbidities. Conclusion: The reported morbidities are high, but moderate or severe functional limitation is more common among those with joint pain or backache and ≥3 morbidities.

Keywords: Functional limitations, geriatric population, India, morbidity

Introduction

Morbidity burden among geriatric age group is an important concern for the health authorities at global level. The rising geriatric population which is mainly driven by an increased life expectancy and falling fertility rates in the developing countries will have far-ranging impact on our health parameters and will place a heavy burden on health infrastructure in the foreseeable future. For India, the population of above 60 years was around 7% in 2001 which is expected to rise to 11.6% by 2026.² Out of the states in India, the demographic transition in Kerala has been the most rapid. The proportion of the elderly increased from 5.8% in 1961 to 10.2% in 2001 and is expected to reach nearly 20% in 2026, a level on par with developed countries.² Presently, geriatric health care should not be ignored by health-care programs and policies as in the past.³ Studies which documents the morbidity pattern can help in planning for strengthening the existing infrastructure to meet the challenges of coming years.³ Various studies in India have shown that the majority of geriatric population suffers from one or more morbidities.³-⁶ A study done at Chandigarh in 2003 reported a prevalence

Access this article online

How to cite this article: Das RA, Kumar SG, Roy G. Morbidity pattern and its relation to functional limitations among old age rural population in Kerala, India. J Family Med Prim Care 2017;6:301-4.

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of morbidity as high as 88.9%. However, there are limited studies in a rural community setting and to find the relation of morbidity with functional limitations. Furthermore, in this part of the country, demographic transition is rapid with increase in proportion of geriatric population. With this background, this study was conducted to assess the epidemiology of morbidity and functional limitations among geriatric population in a rural area of Kerala in India.

Materials and Methods

Setting
This was a community-based cross-sectional study carried out over a period of 4 months from October 2010 to January 2011 in Vellarada ward under Vellarada panchayat, a rural area of Kerala in India.

Sample size estimation and sampling technique
The sample size was estimated based on the consideration of minimum average prevalence of any morbidity as 25% and relative precision at 30% level which was found to be 109. A nonresponse rate of 10% was added to give a final sample size of 120. Examining the records of the study area from the local health authority revealed that the number of people in the geriatric age group above 60 years age to be 167 and it was decided to survey the entire area and include all the participants. It was resolved to classify untraceable persons even after two visits as nonresponders and exclude them from the study. In case of persons incapable of giving information, it was collected from the principal caregiver.

Method of data collection
The study was approved by the Institutional Scientific Committee and Ethics Committee of the institution. At the first step, written consent was obtained from every subject. Previously diagnosed chronic morbidities by registered medical practitioner were included in the reported morbidity profile. House-to-house visits were made and participants were interviewed using a structured pretested interview schedule. Sociodemographic details, blood pressure, diabetes, visual impairment, and other diagnosed morbidities were recorded.

Functional limitations of activities of daily living (ADL) were assessed using 10 item Barthel index scale with the score ranging from 0 to 20 (no impairment). The score for degree of independence with respect to ADL was ranged from 0 to 20. It was interpreted as 20 (no functional limitation), 10–19 (mild), 5–9 (moderate), 1–4 (severe), and 0 (total).

Statistical analysis
Collected data were entered in Statistical Package for Social Sciences version-19 (IBM PASW Statistics-19.0, India country Office, Bangalore). The collected data were analyzed by univariate analysis to find out the association between morbidity and various factors. Findings were expressed in proportion or percentages. P < 0.05 is considered as statistically significant.

Results
We covered all 167 participants by house-to-house visits and there were no nonrespondents in the study. Overall prevalence of any morbidity was 89.2%. One morbidity was reported by 34.1% (57), two morbidities 24% (40), three or more 31.1% (52) of the participants. The most common morbidities reported were hypertension (63, 37.7%), diabetes (61, 36.5%), visual problems and joint pains or backache (51, 30.5% of them each), constipation (20, 12.2%), cardiovascular diseases (10, 6%), and acid peptic disease (9, 5.4%). Overall 34.1% (57) had functional limitations. About 110 participants had no functional limitations while 42 had mild, 12 had moderate, and 3 had severe functional limitations.

Functional limitation was significantly more among more than 70 years age group. Age group was also significantly associated with joint pain/backache and visual impairment with more common among above 70 years age group [Table 1]. It was shown that diabetes and hypertension were significantly more common among females and chest disorders among males [Table 2]. Among those with moderate and severe functional limitation, majority (12, 80%) had ≥3 morbidities, but among those with ≥3 morbidities, 23.1% (12/52) had moderate or severe functional limitations. Joint pain or backache was significantly associated with moderate or severe functional limitation [Table 3].

Discussion
Our study showed that reported morbidity and functional limitations among geriatric population are an important public health problem in an area where the geriatric population is >10% and insists the adoption of secondary and tertiary prevention strategies.

Table 1: Association of types of morbidities and functional limitation with age

| Morbidities                      | 60-69 years | ≥70 years | Total | P   |
|---------------------------------|-------------|-----------|-------|-----|
|                                 | (n=106), n (%) | (n=61), n (%) | (n=167), n (%) |     |
| Diabetes                        | 39 (36.8)   | 22 (36.1) | 61    | 0.925 |
| Hypertension                    | 40 (37.7)   | 23 (37.7) | 63    | 0.997 |
| Visual impairment               | 26 (24.5)   | 35 (57.4) | 61    | 0.000* |
| Chest disorders (COPD, asthma) | 27 (25.5)   | 14 (22.9) | 41    | 0.716 |
| Joint pain/backache             | 24 (22.6)   | 27 (44.3) | 51    | 0.003* |
| Acid peptic disease             | 5 (4.7)     | 4 (6.6)   | 9     | 0.257 |
| Constipation                    | 12 (11.3)   | 8 (13.1)  | 20    | 0.731 |
| Urinary problem                 | 2 (1.9)     | 0         | 2     | -    |
| Malignancy                      | 4 (3.8)     | 2 (3.3)   | 6     | -    |
| Skin disease                    | 1 (0.9)     | 1 (1.6)   | 2     | -    |
| Liver disorder                  | 1 (0.9)     | 1 (1.6)   | 2     | -    |
| Psychiatric disorder (depression)| 2 (1.9)    | 1 (1.6)   | 3     | -    |
| Uterine disorder                | 3 (2.8)     | 1 (1.6)   | 4     | -    |
| Thyroid disorder                | 0           | 1 (1.6)   | 1     | -    |
| Moderate and severe functional limitation | 5 (4.7) | 10 (16.4) | 15 | 0.011* |

*P<0.05 is considered as significant. COPD: Chronic obstructive pulmonary disease
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study, at least one ailment was seen in 72.4%, two ailments were seen in 48.1%, and three or more were seen in 24.1%. It was observed in this study that the average number of morbidities was 4.1; this was 3.28 in the Kashmir study. However, other studies among elderly in North and South India reported it as 2.62 and 2.42, respectively. This variation may be due to a higher prevalence of reported hypertension and diabetes along with other morbidities among the studied population.

Most common morbidities in the present study were hypertension and diabetes with reported prevalence of 37.7% and 36.5%, respectively. This is comparable with the findings of Srinivasan et al with hypertension prevalence as 49.4% and diabetes as 32.3%. Kishore et al found the prevalence of hypertension as 41.1%, Prakash et al as 48%. The musculoskeletal disorders had a prevalence of 30% which is comparable to the Joshi et al study where the prevalence of arthritis was 34%. In most of the studies, the prevalence of musculoskeletal disorders is on the higher side (Chakrabarty et al 67.5%, Padda et al 60.6%). Musculoskeletal disorders are common as people become older there is deterioration of function of the musculoskeletal system leading to restricted mobility which may adversely affect the older people to sustain an independent life in the society.

Respiratory disorders were seen in 24.6% of the elderly in the present study which were less compared to the Joshi et al study where the prevalence was 42%. This difference could be due to other causes such as climatic and sociocultural variation from place to place.

Eye-related diseases were found in 36.5% of the participants which is comparable with many studies (Joshi et al 38%, Parray et al 38.7%, Medhi et al 33%). Most studies have reported visual disorder as the most common morbidity (Purty et al Prakash et al).

In the present study, the musculoskeletal disorders and diseases of the eyes were found to be more common similar to the study by Gaur et al. The musculoskeletal disorders include osteoporosis and osteoarthritis. In the present study, certain morbidities were seen more among females. Diabetes and hypertension were found more in females and this was statistically significant. Similar finding was seen in Purty et al, Parray et al, Kishore et al, Bhatia et al and Abdulraheem IS et al studies. The reason could be because in the process of caring and nurturing other members of the family, women tend to neglect or overlook their own wellbeing.

A study in North India showed that elderly participants with higher morbidity had increasing disability similar to this study. Morbidities which include asthma, chronic obstructive pulmonary disease (COPD), hypertension, osteoarthritis were also associated with disability similar to our study. However, they used rapid disability rating scale for assessment of disability in their study. A recent study using the same instrument found that the functional disability increased with age was more common among persons who were not currently married, had diabetes

### Table 2: Association of types of morbidities and functional limitation with gender

| Types of morbidities          | Male (n=82) | Female (n=85) | Total (n=167) | P     |
|------------------------------|-------------|---------------|---------------|-------|
|                              | n (%)       | n (%)         | n (%)         |       |
| Diabetes                     | 22 (26.8)   | 39 (45.9)     | 61            | 0.011*|
| Hypertension                 | 24 (29.3)   | 39 (45.9)     | 63            | 0.027*|
| Visual impairment            | 26 (31.7)   | 35 (41.2)     | 61            | 0.204 |
| Chest disorders (COPD, asthma)| 26 (31.7)   | 15 (17.6)     | 41            | 0.035*|
| Joint pain/backache          | 21 (25.6)   | 30 (35.3)     | 51            | 0.17  |
| Acid peptic disease          | 5 (6.1)     | 4 (4.7)       | 9             | 0.69  |
| Constipation                 | 8 (9.8)     | 12 (14.1)     | 20            | 0.38  |
| Urinary disorder             | 1 (1.2)     | 1 (1.2)       | 2             | -     |
| Malignancy                   | 2 (2.4)     | 4 (4.7)       | 6             | -     |
| Skin disease                 | 1 (1.2)     | 1 (1.2)       | 2             | -     |
| Liver disorder               | 2 (2.4)     | 0             | 2             | -     |
| Psychiatric disorder         | 2 (2.4)     | 1 (1.2)       | 3             | -     |
| Uterine disorder             | 0           | 4 (4.7)       | 4             | -     |
| Thyroid dysfunction          | 0           | 1 (1.2)       | 1             | -     |
| Moderate and severe functional limitation | 7 (6.6) | 8 (13.1) | 15 | 0.188 |

*0.05 is considered as significant. COPD: Chronic obstructive pulmonary disease

### Table 3: Association of morbidities with functional limitations

| Morbidities          | Functional limitation (moderate and severe) (n=15) | No or minimal functional limitation (n=152) | Total (n=167) | P     |
|----------------------|---------------------------------------------------|-------------------------------------------|---------------|-------|
|                      | n (%)                                             | n (%)                                     | n (%)         |       |
| Number of morbidities|                                                   |                                           |               |       |
| 1                    | 1 (6.7)                                           | 56 (36.8)                                 | 57            | 0.000*|
| 2                    | 2 (13.3)                                          | 38 (25.0)                                 | 40            |       |
| ≥3                   | 12 (80.0)                                         | 40 (26.3)                                 | 52            |       |
| Diabetes             | 5 (33.3)                                          | 56 (36.8)                                 | 61            | 0.788 |
| Hypertension         | 8 (53.3)                                          | 55 (36.18)                                | 63            | 0.191 |
| Joint/backache       | 8 (53.3)                                          | 43 (28.28)                                | 51            | 0.045*|
| Chest disorders      | 5 (33.3)                                          | 36 (23.68)                                | 41            | 0.407 |
| Cardiac disease      | 1 (6.66)                                          | 9 (5.92)                                  | 10            |       |
| Acid peptic disease  | 0                                                 | 9 (5.92)                                  | 9             |       |
| Constipation         | 3 (20)                                            | 17 (11.18)                                | 20            |       |
| Urinary              | 0                                                 | 2 (1.31)                                  | 2             |       |
| Malignancy           | 0                                                 | 6 (3.94)                                  | 6             |       |
| Skin                 | 0                                                 | 2 (1.31)                                  | 2             |       |
| Liver disease        | 1 (6.66)                                          | 1 (0.65)                                  | 2             |       |
| Psychiatric          | 0                                                 | 3 (1.97)                                  | 3             |       |
| Uterine              | 0                                                 | 4 (2.63)                                  | 4             |       |
| Thyroid              | 0                                                 | 1 (0.65)                                  | 1             |       |

*0.05 is considered as significant
and COPD. However, they defined functional disability as having
disability in ADL with score <19 or blindness or bilateral hearing
impairment or a combination of these.\cite{20}

Limitations
The study has limitations inherent to cross-sectional study nature
and inadequate sample size for detecting the difference in each
type of morbidity. As diagnostic procedures were not done to
detect diabetes and other diseases, it may not give the correct
estimate of all types of morbidity. In spite of these limitations,
it gives valuable information in the situational analysis and
predicting the future trend of morbidity and functional limitation
burden which will help in adopting appropriate interventional
strategies by the concerned authorities.

Conclusion
The reported morbidities are high, but moderate or severe
functional limitation is more common among those with joint
pain or backache and ≥3 morbidities. Medhi et al.\cite{21} and Khokhar
and Mehra\cite{22} found that morbidities are seen less in the rural
population when compared to the urban but in the present
study though done at a rural area, the morbidities and functional
limitations are comparable to those of an urban area perhaps
because in Kerala, demographic transition occurred early similar
to that seen in a developed country.

Acknowledgment
We thank State Health Mission and District health authorities
of department of health, Government of Kerala for supporting
the study and the subjects participated in the study.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

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