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Original Research Article

Contribution of Chronic Conditions to Disability among Elderly in a Rural Area of South Karnataka

Tejashwini K, Chethna G

Assistant Professor, Department of Community Medicine, BRAMC, Bangalore.

Corresponding Author: Tejashwini K

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ABSTRACT

Morbidity among elderly people has an important influence on their physical functioning and psychological well-being. The objective of this study was 1) to assess the prevalence of disability among elderly 2) to find out the association between Comorbidity and disability

Methods: A cross sectional study conducted over a period of 18 months in rural area. Data collected through house to house visits. Information gathered using pretested interview questionnaire

Results: 4415 elderly were included in the study, 556 (12.59%) of them were found to be disabled. There was a significant association between comorbidities and disability ($p<0.01$). Multinomial regression analysis showed that the factors like age and morbidities like Hypertension, Diabetes, Cataract and dental problems were contributing to disability.

Keywords: Elderly, Comorbidity, Disability

INTRODUCTION

Aging is a natural process. Due to improved health care services there is decreased infertility and mortality which results in increased geriatric population both in developed as well as developing countries. It has been projected that by the year 2025 there will be 1.2 billion older persons, with two out of three living in a developing country. [1] Health status is an important factor that has a significant impact on the quality of life of elderly population. Geriatric populations suffer both from communicable and non-communicable diseases but due to changing patterns of socioeconomic factors and urbanization, non-communicable diseases are increasing. Old aged people suffer from the dual impact of different chronic diseases. Firstly, they are affected with the chronic diseases itself and secondly, these chronic diseases lead to disability. Both incidences of chronic disease and disability increase with age.

Disability is fast becoming a concern because of its increasing prevalence owing to the aging of the population, the increased risk of disability in older people, and the global increase in chronic conditions. [1] The major underlying causes of physical disability are chronic diseases, including both acute events, such as hip fracture and stroke and slowly progressive diseases such as arthritis and heart disease. These diseases appear to have task-specific effects; understanding this may assist in setting treatment and prevention goals. Preferences in public health priorities differ when the target is mortality or disability. Studies of the contribution of different diseases to mortality have been numerous, but those investigating the contribution of disability are lacking. Several authors compared the contribution of different disorders to

disability [2-4] y to help policymakers decide on intervention and preventive strategies. However, the studies vary in terms of groups studied, diseases and approaches used to define and measure disability. Hence the current study was undertaken to assess the contribution of various comorbidities to disability in our rural field practice area.

MATERIALS AND METHODS

Place of study: Rural field practice area of Department of Community Medicine, Kempegowda Institute of Medical Sciences, and Bangalore.

Study period: One and half years.

Study design: Cross-sectional study.

Study population: All the elderly (aged >60yrs) residing in the villages under three PHC's namely Kumbalgodu, K. Gollahalli, Sulikeri, which are under rural field practice area of our medical teaching institution, with a total population of 61,385 were included in the study.

This cross sectional study was carried out in the rural field practice area of the Department of Community Medicine, KIMS, Bangalore. The study participants were identified from house to house survey. All residents 60 years and above were included in the study. The study instruments included a pre-tested interview schedule, sphygmomanometer, weighing machine, measuring tape and Snellen Chart. The socio- demographic data, illness/ disease status was enquired from subjects and/or their family members, the interviewees were also asked to display the containers of all the medications they were taking and to show all medical reports they possess. Subsequently symptomatology was noted and general physical examination was carried out. Based on reported illness, clinical features, medical records and the medication possessed by them, a provisional clinical diagnosis was made and coded according to international classification (ICD- 10) of diseases.

Criteria for diagnosis

Hypertension: Definition of hypertension (Based on JNC-VII criteria), Normal-Systolic and diastolic < 120/80, **Prehypertensives:** systolic 120-139 or diastolic 80-89 mm of Hg, Stage-1 hypertensive: systolic 140-159 or diastolic 90-99 mm of Hg, Stage-2 hypertensive: systolic 160 or diastolic 100 mm of Hg, The participants with history of hypertension and on antihypertensive drugs and with stage 1 and 2 hypertension were labeled as hypertensive in our study.

Respiratory disease: Particularly chronic bronchitis, asthma and tuberculosis were accepted as diagnosed by clinicians earlier with necessary investigations among elderly population.

Musculo-skeletal diseases: As kyphosis, arthritis and spondylitis already diagnosed by orthopedician with necessary investigation and these cases were accepted as such. Osteoarthritis diagnosis was made based on three symptoms (persistent knee pain, limited morning stiffness and reduced function) and three signs (crepitus, restricted movement and bony enlargement. [5]

Nervous system disorders: Such as cerebral infarction, epilepsy, hemiplegia, neuritis, tremors, anxiety, dementia and depression etc. already diagnosed by neuro physician and psychiatrist with necessary investigation and accepted as such.

Eye diseases: Diagnosed in the field with the help of snellens chart, torch and clinical signs and symptoms.

Socio demographic variables were collected which included age, gender, marital status, religion, education, occupation, and living arrangement. Socio economic status was assessed using modified Standard of Living Index. Disability in ADL was assessed using the Katz index. [6]

One important measure of morbidity is a person's ability to perform the activities of daily living (ADL) mainly the 6 basic personal care tasks like bathing, dressing, toileting, transferring, continence and feeding. IADLs were assessed using the

Lawton-Brody Instrumental Activities of Daily Living (IADL) Scale [7] The IADL screening instrument can uncover more subtle disabilities. These are tasks necessary for independent functioning in the community. They include cooking, cleaning, doing laundry, shopping, using the telephone and means of transportation, taking medicines, and managing money.

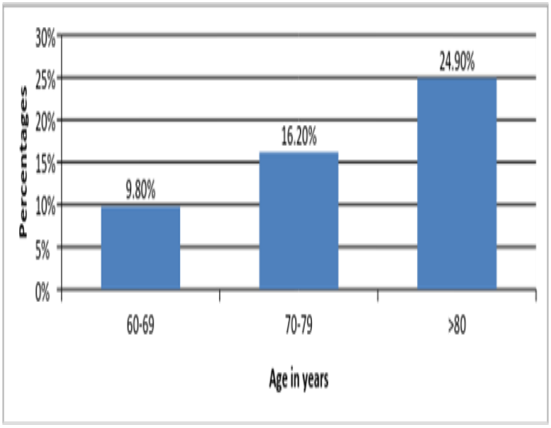
RESULTS

A community based cross sectional study was conducted in the rural field practice area of Kempegowda Institute of Medical Sciences

The total numbers of elderly included in the study were 4415 (7.2% of the total population), out of which 2311 (52.35%) were females and 2104 (47.65%) were males (table 1), with the mean age 67.2. Percentage of young old (60-69), old (70-79) and oldest old (>80) were 2972 (67.3%), 1081 (24.5%) and 362 (8.2%) respectively. Total numbers of disabled elderly were 556 that accounted for 12.6% of the total elderly population.

Table 1: Distribution of elderly according to age and sex (n=4415)

Age group (years)	Male	Female	Total
60-69	1418 (32.1)	1554 (35.2)	2972
70-79	509 (11.5)	572 (13)	1081
>80	177 (4)	185(4.2)	362
Total	**2104(47.7)**	**231 (52.3)**	**4415 (100.0)**



Graph 1: Distribution of disability according to age

Among 556 Disabled elderly, 305(54.9%) were females and 251 (45.1%) were males. Prevalence of disability among the age group 60-69 was 9.8%, 70-79 it was 16.2% and >80yrs it was 24.8%, So it was observed that the disability rates increased with the increasing age (Graph 1) and disability was slightly more in females when compared to males.

Comorbidities among Elderly: The prevalence of different chronic diseases was 52.3% in the study population (4415 elderly). (Table 2), shows the distribution of common co-morbidities among elderly.

Table 2: Distribution of common co-morbidities among the elderly

Co morbidities	Elderly(n=4415)*
Cataract	794 (18.5%)
Hypertension	568(13%)
Diabetes	345(7.8%)
Osteoarthritis	358(8%)
Acid peptic disorder	154(3.5%)
Dental problems	124(2.8%)

*-Multiple responses

A total of 30 chronic diseases were found. Important chronic diseases were cataract (18.5%), Hypertension (13%), Diabetes mellitus (8%), osteoarthritis (8%) Prevalence of Acid peptic disorder accounted for 3.5% , Asthma accounted for 2.5%, COPD was present in 2.2% , Senile deafness was present in 1.35%, Cerebrovascular accidents in 1.3% and other co morbidities like skin and nail infections, urinary incontinence, cancer, corneal opacity, valvular heart disease, prostate hypertrophy, CSOM together accounted for 4.5%.

In the present study it is observed that the prevalence of co-morbidities among non-disabled elderly is 48.1% and among disabled elderly the prevalence of co-morbidities is 81.3%, hence the prevalence of co morbidities is high among disabled elderly and the association was found to be statistically highly significant. (Chi-square=287.4, OR=4.69, P<0.001).Table 3

Table 3: Association between co-morbidities and disability

Co- morbidity	Disabled (n= 556)	Non-disabled (n=3859)	Chi-square	P- value	OR	CI	
						Lower	upper
Present	452(81.3)	1856(48.1)					
Absent	104(18.7)	2003(51.9)		<0.001			
Total	556	3859	287.4		4.69	3.755	5.858

Table 4: Association between individual co morbidity and disability

Co morbidities	Disabled(n=556)	Non-disabled (n=3859)	Chi square value	p-value(chi square)	OR	CI	
						Lower	Upper
Dental problems	47 (8.4)	78(2.04)	70.76	<0.01	4.475	3.081	6.503
Cataract	197(35.4)	601(15.5)	128.1	<0.01	2.975	2.449	3.613
Hypertension	121(21.7)	447(11.5)	44.02	<0.01	2.123	1.697	2.657
Diabetes	81(14.5)	265(6.8)	38.85	<0.01	2.313	1.772	3.019
Osteo arthritis	55(9.8)	278(7.7)	4.68	<0.05	1.414	1.043	1.916

Univariate analysis showed that there is an association between the following morbidities and disability which was found to be statistically significant.

Morbidities-osteoarthritis (chi-square=4.68,OR=1.414, P<0.05), diabetes (chi-square= 38.85,OR=2.313, P<0.01), hypertension(chi-square=44.02,OR=2.123, P<0.01), cataract (chi-square=128.1 ,OR=2.975, P<0.01), dental problems(chi-square= 70.76, OR=4.47,P<0.01), further analysis with multinomial logistic regression revealed that factors like age and morbidities like Cataract, Hypertension, Diabetes, Dental problems were contributing to the Functional disability. Table 4

Multinomial logistic regression was done to assess the effect of various factors on functional disability, the following results were revealed- The odd's ratio for age is 1.443 which was statistically found to be significant (P<0.001),The odd's ratio for Hypertension is 1.546 and the association was found to be statistically significant. OR for Diabetes is 1.750 and the association was statistically significant. OR for Dental problems was 2.511 and the association was statistically significant.

However with multinomial logistic regression analysis we did not find any significant association between Osteoarthritis (OR=1.273, P>0.05) and functional disability. (Table 5)

Table 5: Association between disability and risk factors by Multinomial logistic regression analysis

Predictor variable	B	Std. Error	Wald	df	P value	Exp(B)	95% CI	
							Lower bound	Upper bound
Age	.367	.105	12.286	1	<0.001	1.443	1.175	1.771
Sex	.135	.100	1.837	1	.175	1.144	.942	1.391
Cataract	.779	.132	35.023	1	<0.001	2.178	1.683	2.819
HTN	.435	.141	9.580	1	<0.001	1.546	1.173	2.036
Diabetes	.559	.156	12.826	1	<0.001	1.750	1.288	2.376
Osteoarthritis	.242	.177	1.860	1	.173	1.273	.900	1.802
Acid peptic disorder	.016	.263	.004	1	.952	1.016	.606	1.702

DISCUSSION

In present study the prevalence of disability among elderly in rural area was found to be 12.6%. World Health Organization estimates that 10% of the world's population has some form of disability. The disability prevalence varies with age, the burden is more among geriatric age group with 6.4% and 5.5% prevalence in rural and urban areas respectively according to NSSO survey. [8] Similar study conducted by Ganesh KS et al have quoted prevalence rate of 21%. The differences observed in various studies are mainly due to difference in methodology adopted, conceptual framework, operational definitions used for different types of disabilities along with sociocultural and risk factors prevailing in that area.

In our study, prevalence of disability was slightly more in a female which was 54.9% than males, which was 45.1%. With respect to gender distribution, few studies have shown proportionately more disability among females, while in NSSO survey the prevalence of disability is more among males, in both rural and urban areas.

Prevalence of co morbidities: The overall prevalence rate of co morbidities among elderly in our study was found to be 47.6%. In a study conducted in rural Chandigarh a prevalence rate of 77.6% of morbidities was noted. [9] This wide variation of prevalence of morbidity may be due to the differences

in the racial and ethnic origin of the study populations, socioeconomic status, criteria for considering older people and the questionnaires used.

In our study the most common morbidities found among elderly were cataract (18%) followed by Hypertension (13%), Osteoarthritis, and Diabetes mellitus.

Prevalence of cataract: A study conducted by MM Singh, GV Murthy, R Venkataraman et al revealed that the prevalence of blindness and low vision was 32% and the most common cause for this was cataract and refractive errors. [10] In a study conducted by Rahul Prakash, S.K. Choudhary et the prevalence of cataract was reported to be 44 %. [11] A study by, Mishra et al (1980) reported in 25.8% elderly. In our study the prevalence of cataract was 18%, which was similar to the findings in a study conducted at Chandigarh by HM Swami, Vikas Bhatia et al where the prevalence of cataract was 20% among rural elderly [9] The difference in prevalence between the studies can be explained by two main reasons 1) Most of the study data on cataract prevalence are a decade old and the 2) Advancement in health care and a bit higher coverage of rural area by camps organizing cataract surgeries.

Prevalence of Hypertension: In our study the prevalence of Hypertension among rural elderly accounted for 13% similar study done by Shashank R Joshi *et al.* [12] on the elderly rural population of Delhi, showing the prevalence of hypertension as 11.25%, and this study also showed a higher prevalence of hypertension in elderly persons in urban area compared to rural area. A study done by Krishnan et al [13] showed a prevalence of 10.7% in a rural community of Haryana. A Meta analysis of studies from rural India done between 1995 to 2002 showed the prevalence of hypertension to be 15.7 %(ICMR 2004),

Prevalence of Diabetes mellitus: In our study the prevalence of diabetes was found to be 8% which is a similar finding in a study conducted by HM Swami, Vikas Bhatia et al in Chandigarh, where prevalence of diabetes was found to be 12.2% (09). In a study conducted at Tamilnadu by Shankar Radhakrishnan, Sangeetha Balamurugan et al the prevalence of Diabetes was reported to be 36%. [14] As we considered only the diagnosed cases of diabetes, we would have missed a greater portion of undiagnosed diabetics which forms the major part of the iceberg.

Prevalence of Osteoarthritis: In our study the prevalence of Osteoarthritis was 8% and more than fifty percent of the study subjects complained of joint pains, A study conducted by SD Kandpal, Rakesh kakkar et al in a district of Dehradun revealed a percentage of 7% of osteoarthritis in rural geriatric population and a 39% prevalence in urban population [15] and in a study conducted by SV Kamble YD Ghodke et al in a rural area of India revealed the prevalence of Osteoarthritis to be 24%. [16]

Association between Co morbidity and disability- In our study there was a significant association found between co morbidities and disability Association between different risk factors and functional disability by multinomial logistic regression analysis showed that age, Hypertension, Cataract, Diabetes and Dental problems were the risk factors of disability, a study conducted by Joshi et al, a cross-sectional study at rural and urban area of Chandigarh (India), found that morbidities like hypertension, osteoarthritis, gastrointestinal disorders, eye and neurological problems were significantly associated with disability [17] A study conducted by Chakrabarthy et al in a rural community of India , there was a strong association found between morbidities like hypertension, diabetes, osteoarthritis, anemia with disability. [18]

CONCLUSION AND RECOMMENDATIONS

Elderly should be made aware about regular health checkups to ensure early detection and prevention of chronic diseases. It is essential to have geriatric care unit with skilled professionals to handle geriatric population and to treat geriatric

morbid conditions.

As this was a descriptive study, the factors found as associated with disability could be suggestive, not a causal one. Few of the risk factors of disability were explained by the present study. There may be other factors for causation of disability, which were not identified in this study. Future analytical study with large sample would be conclusive for causal factors of disability.

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