

Functional Impairments: A Study in Elderly Individuals

Ankur Barua, Jayant Hazarika, M.A. Babilio, Shashi J. Soans, Colin M., Asha Kamath

Department of Community Medicine, Kasturba Medical College,
Manipal and Sikkim Manipal Institute of Medical Sciences (SMIMS), Sikkim, India

Abstract: India stands second to China in its elderly population. Functional impairments are common in elderly due to various physical & psychosocial factors. The Objectives were (1) To study the different functional impairments in elderly patients; (2) To study the socio-demographic correlates associated with functional impairments in these elderly patients. A Cross-sectional study was conducted among 492 individuals in the age group of 65 years and above. Data was tabulated and analyzed by using statistical software package of SPSS 7.0 version. It was observed that 36.2% of the study individuals had at least one or more functional impairments. The common ones were visual (46.7%), difficulty in moving one or both lower limbs (42.3%) & difficulty in adjusting with the physical home environment (32.9%). Multiple Logistic Regression analysis revealed that age group of 75 years and above, history of death in the family within last twelve months and above, a history of accidents during last 5 years and presence of three or more chronic illnesses were independently associated with functional impairments in elderly individuals.

Key Words: Elderly, Functional, Impairment, Correlates

INTRODUCTION

India stands second to China in its elderly population with 7% of Indian population belonging to the age group of 65 years and above and it is expected to rise to 10% by 2030.¹ This geriatric population in developing countries like India are vulnerable to greater socio-economic and health marginalization mainly due to inadequate provision of services and economic deprivation.^{1,2}

Functional ability is the ability to perform basic activities of daily life without support, which is the key to overall independence and quality of life. We must be able to identify and measure factors limiting functional ability. We need to find ways of identifying people most at risk of losing these abilities. The passage from a state of independence to that of dependence is characterized by the inability to perform activities of daily living such as getting out of bed, dressing, personal hygiene, eating and walking. Functional ability refers only to that part of functional capacity which is related to essential activities of daily life. Functional ability impairment means a decreased ability to meet one's own daily needs.³ Though functional impairments are common in elderly due to various physical & psychosocial factors, clinicians often fail to assess the functional impairments of individuals visiting the Out Patient Departments (OPD) due to their busy schedule or lack of initiative or inadequate clinical skills⁴. Functional ability has numerous dimensions or components and its assessment must be similarly constructed. Physical performance tests can be described according to these different dimensions, i.e., mobility, manual ability, flexibility, muscular strength, psychomotor and cognitive function⁵.

Ethnic and socio economic factors have an influence on the lives of every individual in the geriatric age group. But every impairment or dysfunction does not necessarily have to have a bearing on another. Individuals in the age group

of 65 years and above, with visual impairment, would eventually suffer from depression, be it mild, moderate or severe depending on the impairment as he or she would love to see their family, children, grandchildren and loved ones and would love to take part with them in their day to day enjoyment. The approach relies on checking a limited number of targets that are commonly dysfunctional but often unappreciated when conventional histories and physical examinations are done for the elderly.^{2,6,7}

MATERIALS & METHODS

A cross-sectional study of 492 individuals in the age group of 65 years and above, visiting the Out-Patient Departments (OPDs) of Medicine speciality at Kasturba Hospital, Manipal and Central Referral Hospital (CRH), Sikkim, during the study period, were included in this study.

Data Collection: After informed verbal consent was obtained, a pre-designed & pre-tested questionnaire was used to collect the socio-demographic profile of the individuals visiting the OPD of Medicine speciality. The functional impairments were assessed by administering the clinical guidelines from the instrument entitled, "Clinical Assessment of an Older Patient" developed by the World Health Organization.⁶

Data Analysis: Data was tabulated and analyzed by using statistical software package of SPSS 7.5 version. Results were calculated in terms of proportions. Chi-square test was applied to study the relationship between different variables and functional impairments. To determine the independent effect of various factors on functional impairments, Multiple Logistic Regression was performed and their significance was estimated in terms of adjusted OR and its 95% confidence interval. *P* value less than 0.05 was considered as significant.

RESULTS

Mean age of the study individuals was 71.4 years. Their

Correspondence: Dr. Ankur Barua, Associate Professor, Department of Community Medicine, Melaka-Manipal Medical College (MMMC), Jalan Batu Hampar, Bukit Baru, Melaka-75150. Malaysia Mobile: +60122569902, E-mail: ankurbarua26@yahoo.com

age groups ranged between 65 and 88 years. Majority (62.1%) of individuals belonged to the age group of (65-69) years. 60.6% were married, 76.8% were Hindus, 63% were illiterates, 58.9% were unemployed, 84.7% were living with children or relatives and only 9% were financially independent.

It was found that 178(36.2%) of the respondents had at least one or more functional impairments. Among those who had functional impairments, the most common ones were visual (46.7%), difficulty in moving one or both lower limbs (42.3%) & difficulty in adjusting with the physical home environment (32.9%). Lower body dysfunction will affect mobility, and have an impact on other factors such as anxiety, fear of falls and balance⁸.

Majority of males (38.6%) had functional impairments (Table 1). Prevalence of functional impairments was found to be significantly increasing with age [χ^2 for linear trend=10.9 and $p=0.002^*$]. Individuals belonging to the age group of 75 years & above had significantly higher proportion of functional impairments (82.6%) than other elderly age groups. In a hospital-based study, similar findings were earlier reported by the author⁹.

Table 1: Socio-demographic Correlates of Functional Impairments in Elderly

Socio-demographic Correlates	Total Respondents (N=492)	Individuals with Functional Impairment (n=178)	Percentage (%)
1. Gender			
Female	186	60	32.3
Male	306	118	38.6
2. Age group (years)			
65-69	320	65	20.3
70-74	80	37	46.3
≥75	92	76	82.6*
3. Marital status			
Single	178	66	37.1
Married	314	112	35.7
4. Literacy status			
Illiterate	382	130	34.0
Literate	110	48	43.6
5. Occupational status			
Unemployed	270	107	39.6
Unskilled	32	11	34.4
Skilled	126	37	29.4
Professional	64	23	35.9
6. Religion			
Hindu	394	144	36.5
Muslim	52	20	38.5
Christian	46	14	30.4
7. H/o Death in Family during last 12 months			
Present	62	49	79.0*
Absent	430	129	30.0
8. Living arrangement			
Living alone	48	26	54.2*
Living only with children / relatives	402	142	35.3
Living with spouse	42	10	23.8
9. Financial Dependency			
Totally dependent	252	105	41.7
Partially dependent	184	60	32.6
Totally independent	56	13	23.2
10. H/o accidents in last 5 years			
Present	418	172	41.1*
Absent	74	6	9.5

In this study, singles were almost equally affected with functional impairments as married individuals. Literates (43.6%) and unemployed individuals (39.6%) were more

affected with functional impairments, but the differences were not found to be statistically significant. Functional impairments were significantly higher among those who had a history of death in the family within last 12 months (79%) and those who were staying alone (54.2%). There is evidence that in many developing countries, especially in the growing urban areas, the extended family and traditional coping systems for older people are beginning to show signs of strain¹⁰. Thus, understanding the mechanisms behind the maintenance of functional ability, and devising strategies to preserve it for as long as possible, will have a beneficial impact on millions of elderly people and their families in a number of physical, economic, social and emotional ways. In this study, 418(85.0%) of the respondents had encountered accidents in the past 5 years and 41.1% of them were functionally impaired. This was also found to be statistically significant [$\chi^2=4.6$ (Yates corrected), $p=0.029^*$]. The accidents encountered were road traffic accidents, domestic and occupational in nature. Domestic accidents (84%) were the most common form of accidents encountered as compared to others.

In this study, 387(78.7%) people presented with either one or more than one chronic illnesses (Table 2). Among those suffering from any chronic illness, 43.8% had at least a functional impairment. The common chronic illnesses associated with functional impairments were Diabetes Mellitus (63%), Hypertension (30%), COPD (20.9%), Pulmonary Tuberculosis (15%) and Bronchial Asthma (12.9%). These findings are consistent with the observations reported Penninx Brenda W.J.H et al¹¹. In a study conducted by Kennedy Gary J. et al¹² in USA the prevalence of depression and functional impairments were highest among those with four or more co-morbid chronic conditions (30.2%) and the difference as compared with other groups was found to be statistically significant.

Table2: Functional Impairments in Individuals with Chronic Illness

Chronic Illness	Number (n=387)	Percentage (%)
Diabetes mellitus	244	63.0
Hypertension	116	30.0
Bronchial asthma	50	12.9
Osteoarthritis	39	10.1
Pulmonary Tuberculosis	58	15.0
COPD (Chronic Obstructive Pulmonary Diseases)	81	20.9
Renal failure	12	3.1
CVA (Cerebro-vascular Accidents)	31	8.0
Angina (stable or unstable)	46	11.9

* Multiple responses were obtained for chronic illnesses associated with functional impairments.

Multiple Logistic Regression analysis (Table 3) revealed that age group of 75 years and above, history of death in the family within last twelve months, a history of accidents during last 5 years and presence of three or more chronic

Table 3: Correlates of Functional Impairments: Multiple Logistic Regression Analysis

Correlates of Functional Impairments	Category	OR (adjusted)	95% C.I.	p-value
Gender	(a) Male	1.00	-	-
	(b) Female	0.87	0.21-3.60	0.851
Age Group(years)	(a) 65-69	1.00	-	-
	(b) 70-74	2.60	1.65-10.43	0.182
	(c) ≥75	10.47	1.78-21.01	0.009*
Financial Dependence	(a) Totally Independent	1.00	-	-
	(b) Partial	2.28	0.34-15.37	0.406
	(c) Totally dependent	2.61	0.28-24.50	0.410
Marital Status	(a) Married	1.00	-	-
	(b) Single (Unmarried/ Widowed/ Separated)	0.76	0.14-4.04	0.751
Living Arrangement in Household	(a) With spouse	1.00	-	-
	(b) With children & relatives	1.70	0.22-13.39	0.618
	(c) Alone	1.24	0.89-17.24	0.872
Literacy Status	(a) Literate	1.00	-	-
	(b) Illiterate	0.23	0.05-1.02	0.054
H/o Death in the Family within last 6months	(a) Absent	1.00	-	-
	(b) Present	9.81	1.22-16.73	0.023*
H/o Accidents in last 5 years	(a) Absent	1.00	-	-
	(b) Present	8.16	2.28-18.42	0.012*
Presence of Chronic Illnesses	(a) 0-2	1.00	-	-
	(b) ≥3	16.3	1.23-13.47	0.001*

* p value <0.05 was considered as significant

illnesses were independently associated with functional impairments in elderly individuals.

REFERENCES

1. Lachs MS, Alvan RF, Leo MC Jr, Margaret AD, Richard AM, Fitzhugh CP, Mary ET. A simple procedure for general screening for functional disability in elderly pa-

2. tients. *Annals of internal medicine* 1990; 113(7): 557-8.
2. Kane RA, Kane RL. *Assessing the elderly*. Lexington, Massachusetts: Lexington Books; 1981.
3. Besdine R.W. *Functional assessment in the elderly*. In *Geriatric Medicine*, 2nd ed. [J.L. Rowe and R. W. Besdine, editors]. Boston: Little, Brown and Co. Inc.; 1990: 37-51.
4. Manandhar M.C. *Functional ability and nutritional status of free-living elderly people*. *Proceedings of the Nutrition Society* 1995; 54: 677-691.
5. Branch L.G, Meyers A.R. *Assessing physical function in the elderly*. *Clinics in Geriatric Medicine* 1987; 3: 29-51.
6. Dey AB, editor. *Handbook on Health Care of the Elderly: A manual for physicians and in Primary and Secondary Health Care Facilities*. New Delhi: The World Health Organization: Regional Office for Southeast Asia, Ministry of Health and Family Welfare, All India Institute of Medical Sciences (India); 1999.
7. Barua A., Acharya D., Nagaraj K., Bhat H.V., Nair N.S. *Depression in Elderly: A cross-sectional study in rural South India*. *Journal of International Medical Sciences Academy (JIMSA)*, Oct-Dec 2007; 20(4):259-61.
8. Tinetti M.E., Baker D.L., McAvay G., Claus E.B., Garrett P., Gottschalk M., Koch M.L., Trainor K., Horwitz R.I. *A multi-factorial intervention to reduce the risk of falling among elderly people living in the community*. *New England Journal of Medicine* 1994; 331: 821-7.
9. Barua A., R. Mangesh, Kumar Harsha H.N., Mathew S. *A cross-sectional study on Quality of Life in Geriatric Population*. *Indian Journal of Community Medicine*, April-June 2007; 32(2):146-7.
10. Hashimoto A., Kendig H.L., Coppard L.C. *Family support to the elderly in international perspective*. In *Family Support for the Elderly* [H. L. Kendig, A. Hashimoto and L. C. Coppard, editors]. New York: Oxford University Press and WHO; 1992: 293-308.
11. Penninx Brenda WJH, Leveille S, Ferrucci L, Eijk JTM, Guralnik JM. *Exploring the effect of depression on Physical disability: Longitudinal evidence from the established populations for epidemiologic studies of the elderly*. *American Journal of Public Health* 1999; 89: 1346-52.
12. Kennedy Gary J, Kelman R Howard, Thomas Cynthia, Wisniewski Wendy, Metz Helen, Bijur E Polly. *Hierarchy of characteristics associated with Depressive Symptoms in an urban elderly sample*. *American Journal of Psychiatry* 1989 February; 146(2): 220-25.

Special Issues

- Endourology Update
- Constipation: Emerging Horizons
- Imaging in the 21st Century
- Advances in Pediatric Surgery
- HIV/AIDS: Emerging Trends
- Recent Advances & Future Trends in Healthcare

Future Special Issues/ Symposia

Symposia

- Diabetic Foot: Newer Dimensions
- Common Psychiatric Disorders
- Sleep Disorders: Current Perspective

Flupirtine

DRUG PROFILE

Indication: Flupirtine is a centrally acting non-narcotic analgesic with N-methyl-D- aspartate (NMDA) receptor antagonist property which has been shown to be effective in the management of postoperative and other painful conditions in which the primary requirement is analgesia without sedation or anti-inflammatory effects. **Chemistry:** Is a derivative of triaminopyridine is available as the maleate salt. **Pharmacodynamic Effect:** the spectrum of action of Flupirtine Include analgesia, muscle relaxation and neuroprotection; this drugs is neuroprotective, antiepileptic and antiparkinsonism and does not appear to interact directly with adrenoreceptors, dopaminergic receptors benzodiazepine receptors, nicotinic receptors or 5-HT receptors. **Pharmacokinetics:** Flupirtinemaleate is freely soluble in water and undergoes rapid gastric absorption appear in the plasma within 15-30 minutes resulting in peak plasma concentrations (Cmax) of approximately 0.8 and 2.0mg/l at 1.6 to 2 hours (Tmax) post dose. Bioavailability in comparison with an intravenous dose of flupirtine tartrate 80mg was 100% for the oral dose and 72.5% for the rectal dose. Over a plasma concentration range of 0.05 to 2.0mg/L, flupirtine was 94% bound to plasma proteins in the rat and 0 to 84% reversibly bound to human albumin. Flupirtine, whether administered orally or rectally, undergoes biotransformation in the liver to two primary metabolites, p-fluoro-hippuric acid an acetylated metabolite which has 20 to 30% of the analgesic activity of the parent compound clearance in healthy volunteers was 16.5 L/h, 72% was excreted in the urine, 18% was excreted in the feces, half-life of flupirtine following intravenous administration was 1.8 hours, oral and rectal routes was 8.5, 9.6 and 10.7 hours, respectively, decrease in the initial dose of flupirtine, possibly accompanied by increase in dose interval, would appear prudent in elderly patients. Recommendations for dose adjustment in elderly patients should also apply to patients with mild degrees of renal impairment. Flupirtine should be administered cautiously in patients with hepatic disease, especially those with primary biliary cirrhosis and/or a history of encephalopathy.