PATTERNS OF MULTIMORBIDITY AMONG ELDERLY IN AN URBAN AREA OF NORTH INDIA

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ABSTRACT

BACKGROUND

Ageing is a natural process. By 2020, the number of people aged 60 years and older will outnumber children younger than 5 years in the entire world. This natural phenomenon of population ageing is rampant in developing countries like India while data and studies regarding health conditions and prevalence of multimorbidity is lacking.

AIMS AND OBJECTIVES

This cross sectional study was conducted to determine the morbidity pattern and health care seeking behaviour of elderly in North India.

SETTINGS AND DESIGN

Community based Cross-sectional study in Urban Field Practice Area, Shimlapuri.

MATERIALS AND METHODS

A Community based cross-sectional study was conducted in Urban field practice area, Shimlapuri under the Department of Community Medicine of Dayanand Medical College and hospital, Ludhiana, Punjab, India from June 2014 to December 2014. The study population comprised of 534 elderlies above 60 years of age, both males and females residing in the area. The subjects were interviewed and examined in accordance with a pre-structured proforma by field workers, medical interns and faculty members. Majority of the morbidity profile was obtained through history. Information on diseases including visual impairment, respiratory diseases, musculoskeletal disorder, acid peptic disease, deafness and stroke were based on history given by the participants. The association of multimorbidity with socio demographic variables was studied.

STATISTICAL ANALYSIS

Percentages and Chi Square Test.

RESULTS

The mean age of the participants was 66.27 ± 6.26 years. Majority of the subjects belonged to age group of 60-69 years (70%). Morbidity was observed in 99.5% subjects. The most common chronic condition was eye problem (68.5%) including visual impairment and refractive error. Hypertension and acid peptic disease were found to be significantly higher among females ($p<0.01$). A total of 352 study subjects (65.9%) were found to be suffering from multimorbidity. There was significant association between multimorbidity and marital status ($p<0.001$). Almost two-third of elderly belonging to middle socioeconomic status suffered from multimorbidity (p 0.0019).

CONCLUSION

This high prevalence of multimorbidity in the geriatric population calls for greater allocation of primary health care to this population subgroup. Better Preventive programs, specifically targeting the elderly should be implemented.

KEYWORDS

Elderly, Morbidity, Health Behaviour, Cross-Sectional Study.

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INTRODUCTION

Ageing is an inescapable part of human life. In almost every country, the proportion of people aged over 60 years is growing faster than any other age group.

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This population ageing can be seen as a success story for public health policies and for socioeconomic development, but it also challenges the society to adapt, in order to maximize the health and functional capacity of older people as well as their social participation and security.[1] Population aging defined as a shift of population age composition towards the older ages, is a direct repercussion of decrease in fertility and increase in life expectancy.[2] Between 2015 and 2050, the proportion of the world's population over 60 years will nearly double from 12% to 22%. By 2020, the number of people aged 60 years and older will outnumber children younger than 5 years. In 2050, 80% of older people will be living in low-and middle-income countries.

The pace of population ageing is much faster than in the past. All countries face the hurdle to ensure that their health and social systems are ready to make the most of this demographic shift.[3] In India, the percentage of elderly population (60+) has gone up from 5.3 to 5.7 percent and 6.0 to 8.0 percent respectively from 1995 to 2011.[4] India has thus acquired the label of "An aging Nation".

With increasing age, the pattern of diseases is also changing from communicable to non-communicable chronic diseases. These chronic diseases accumulate and present as multimorbidity in this population subgroup. Multimorbidity is defined as any combination of chronic disease with at least one other disease (Acute or chronic) or biopsychosocial factor (Associated or not) or somatic risk factor.[5,6]

With increasing chronic illnesses, awareness and health seeking behaviour among the elderly has increased but the delivery of health facilities at the household level has gone down due to financial constraints and increased cost of living.[7] This study analyses the causes of morbidity in the elderly, from where they seek care and their average monthly expenditure. Assessment of this morbidity pattern and health seeking behaviour will help us in formulating better plans and programs and the application of these interventions in the community can improve the health status and quality of life of senior citizens.

MATERIAL AND METHODS

A community based cross sectional study was carried out in urban field practice area, Shimlapuri under the Department of Community Medicine of Dayanand medical college and hospital, Ludhiana, Punjab, India. This urban field practice area has a population of 11,257. The study subjects included all the elderly people i.e. persons above 60 years, both male and female residing in this urban field practice area. The study was carried out from June 2014 to December 2014. Home based comprehensive health care is provided to the population of this area by multipurpose health workers under the supervision of faculty of department of Community Medicine. A folder containing information on demographic variables and other health data is maintained for each family. A list of all senior citizens was prepared from these folders. The total no. of senior citizens in the study population was 534 i.e. 4.7% of the total population of the area.

The study population (534 subjects) was interviewed by a house to house survey. Informed consent was taken from the study participants and purpose of the study was duly explained to them. The interview was based on a predesigned, pre-structured proforma. This information was collected by field workers, medical interns and faculty members. Training was given to them. The subjects were asked questions which included demographic profile, source of livelihood, morbidity profile, health care seeking behaviour, average medical expenses per month, source of these expenses and whether they adhered to the pharmacological interventions. Majority of the morbidity profile was obtained through history. Information on diseases including visual impairment, respiratory diseases, musculoskeletal disorder, psychological distress, acid peptic disease, deafness and stroke were based on history given by the participants. Subjects currently on anti-diabetic and anti-hypertensive treatment were assumed to be suffering from diabetes mellitus and hypertension.

Their blood pressure was measured using a manual sphygmomanometer. Hypertension was classified according to JNC7.[8] Socio-economic status was determined by using Kuppuswami scale.[9] Anthropometric data regarding height and weight was also taken. The weight of the respondents was measured by using portable weighing machine which was placed horizontally on a level surface and participants were asked to stand on it without any footwear and with minimum covered clothing. The height of the participants was measured by portable stadiometer. The body mass index (BMI) was calculated as weight (In Kilograms) ÷ height (In metre).[2] Asian classification of obesity was used to classify the study population.[10] Their general physical examination was also carried out to check for anaemia.

Multimorbidity was defined as any combination of chronic disease with at least one other disease (Acute or chronic) or biopsychosocial factor (Associated or not) or somatic risk factor.[5,8] Chronic conditions included in the study i.e. eye problems, hypertension, respiratory diseases, musculoskeletal disorders, psychological distress, acid peptic disease, anaemia, genitourinary diseases, cognitive impairment, deafness, stroke, diabetes and dental problems. Chronic disease was defined as one lasting 3 months or more, by the definition of the United States National Centre of Health Statistics.

Statistical Analysis

The data was analyzed using SPSS 20. Chi square test was used to find the association between socio-demographic variables and multimorbidity.

RESULTS

The mean age of the participants was 66.27±6.26 years. The demographic data of the subjects is given in Table 1. Out of the 534 study subjects, 244 (45.7%) were males and 290 (54.3%) were females. Most (62%) of the subjects belonged to Sikh religion, 37.4% were Hindu and 0.6% were Muslim. Majority of the subjects belonged to age group of 60-69 years (70%) followed by 70-79 years (23.2%) and only 5.8% were >80 years. It was observed that 45.1% of elderly were illiterate and 54.9% were literate. As per the modified Kuppuswamy scale, most of the subjects belonged to the middle socioeconomic status (56.8%) followed by 25% to upper lower and 17.9% to the upper class. Most of the elderly were involved in household work (59.5%). In addition, 70.6% of elderly were found to be living in a joint family as compared to 29.4% in a nuclear family. Majority of them, (95.5%) lived in their own houses and only 4.5% lived in rented houses.

BMI was calculated for all the study subjects. Distribution of the study population according to BMI (Table 2). Almost half of the elderly (49%) were overweight and obese while 16.7% were underweight. Morbidity was recorded in 531 subjects out of the 534, i.e. 99.5%. Only 3 senior citizens gave no history of any disease (0.5%). Table 3 shows the occurrence of chronic conditions among the study subjects which were used for defining multimorbidity. The most common chronic condition was eye problem, (68.5%) including visual impairment and refractive error. Other chronic diseases included hypertension (44%), acid peptic disease (38%) and diabetes mellitus (11%) followed by respiratory diseases (10%), musculoskeletal disorders (7.5%), anaemia (6.4%), psychological distress (4.3%), dental problems (2.8%), deafness (2%) and stroke (1.4%).

Hypertension and acid peptic disease were found to be significantly higher among females as compared to males (p<0.01). Diabetes was also found to be more in females (p 0.07), as compared to males. There was not much difference in occurrence of other chronic diseases with respect to gender.

A total of 352 study subjects (65.9%) were found to be suffering from 2 or more chronic conditions i.e. multimorbidity. Distribution of subjects according to the number of medical conditions is shown in the graph (Figure 4). It shows that 34.7% of the senior citizens were suffering from two chronic diseases followed by 19.8% suffering from 3 chronic illnesses, 8.2% with 4 conditions, 2.2% with five and 0.5% were found to be suffering from six chronic diseases.

Table 5 shows association of multimorbidity with age, gender, literacy, marital status, socioeconomic status, BMI and type of family. Two-third of females (75.5%) suffered from multimorbidity as compared to males (54.5%) and this difference was found to be highly significant (p<0.001). Multimorbidity showed an increasing trend with increasing age, 77.4% of the elderly above 80 years had multimorbid conditions compared to 63% in elderly belonging to 60-69 years' age group. There was significant difference in the occurrence of multimorbity among Widows (79.2%), unmarried (66.7%) as compared to currently married elderly (p<0.001). Almost two-third of elderly belonging to middle socioeconomic status suffered from multimorbidity (74%) as compared to upper (57.3%) or lower class (56.7%) and this was found to be highly significant (p 0.0019). Almost two third of elderly living in joint families (69.7%) suffered from multimorbidity as compared to elderly living in nuclear families (56.7%) and this association was found to be significant (p 0.03).

Table 6 shows the health care seeking behaviour of senior citizens. Majority of the elderly people consulted a private doctor (82.9%) followed by urban health centre (14.4%), government hospital (5.4%), registered medical practitioner (4.1%) or dispensary (0.7%). Majority (74.5%) of them had average medical expenses up to 500 rupees per month and majority (95.1%) of them adhered to their pharmacological interventions.

DISCUSSION

This community based cross-sectional study observed a very high prevalence of morbidity (99.5%) in the study population of Urban health centre, Shimlapuri. This was found to be higher than studies carried out among elderly in Shimla (84%).[11] Chandigarh and Haryana (88.9%).[12] Northeast India (70%).[13] and Eastern India (88.5%).[14] Similar studies from other countries have reported the presence of morbidity as 84% in Bangladesh.[5] and 78% in South Korea.[15] This high rate of observation of morbidity in this study may be due to various factors, i.e. increased awareness by regular visits of field workers leading to increased visits to hospitals and private doctors leading to increased chances of diagnosing various chronic conditions.

The mean and median of morbidities per person was calculated to be 2.1 and 2.0 respectively, which is comparable to other studies conducted in India in which mean was 2.01 in Patiala by Singh et al.[16] in 2010 and 2.6 in Amritsar by Padda et al.[17] In contrast Kishore et al.[6] reported a much greater number of mean morbidities (6.7) in Uttarakhand in 2015 and 3.7 in Saudi Arabia (Mohamed et al.[18] in 2011). Similar to the present study, Kumar et al.[19] reported prevalence of eye problems to be 63%, followed by hypertension (44%) and respiratory diseases (34%) and Barman et al reported cataract in 61.25% and hypertension in 50.63% in a study done in Bihar.[20]

In contrast a study by Kokhar et al.[21] dental problems were the commonest morbidity (90.62%) followed by musculoskeletal (71%) and visual impairment (69%). It may be due to the reason that study was conducted among migrants. Srinivas et al.[22] found diseases of Musculoskeletal System (39%) to be most commonly seen followed by diseases of Circulatory system (21%) and diseases of Eye and adnexa (20%) in their study population.

The overall prevalence of multimorbidity recorded was 66%. This was comparable to studies done in Odisha.[23] Bangladesh.[6] and West Africa.[24] which observed multimorbidity as 57%, 58% and 65% in the study population respectively. While another study in China by wang et al.[25] in 2011 observed a much higher percentage i.e. 90%.

Multimorbidity showed an increasing trend with increasing age. Almost two-third of elderly (77.4%) above 80 years had multimorbid conditions compared to 63% in elderly in 60-69 years' age group. According to a meta-analysis done by Marengoni et al.[26] in 2011 female gender, older age and low socioeconomic status are associated with higher multimorbidity.

Multimorbidity was higher in females (75.5%) as compared to males (54.5%) and this was found to be highly significant (p<0.001). This is in comparison to findings in another study conducted in Bangladesh by Khanam et al.[5] in 2004 in which 65% females suffered from multimorbidity as compared to 39% males. As older women are more likely than older men to be unemployed, and/or widowed, and to engage in less exercise and foremost in taking care of other family members, female usually neglects her health and it can be the reason for poor health of female. In the present study almost two third of subjects belonging to middle class were having multimorbidity. A highly significant association was observed between socioeconomic status and multimorbidity (p<0.001).

Mental stress is also one of the risk factors for non-communicable diseases. Multimorbidity was higher in widows (79.2%) and unmarried (66%) as compared to elderly living with spouse (p<0.001). Loneliness may be the cause for higher occurrence of morbidity.

It was observed that 70.6% people in the study population live in joint families compared to 29.4% in nuclear families. Kishore et al.[7] reported 38.1% living in joint families, rao et al.[27] 26% in Madurai and narapureddy et al.[28] 34% in Allahabad. The prevalence of multimorbidity was higher in joint families (69.7%) as compared to nuclear families (56.7%), and this was found to be statistically significant (p 0.003). Indian joint families are considered to be more strong, stable, close, resilient and enduring with focus on family unity.[29] This could be due to the reason that almost 90% of elderly aged more than 75 years were residing in joint family and morbidity increases with increase in age.

CONCLUSION

Majority of the elderly suffered from some form of morbidity and more than half of them suffered from multimorbidity. This proves that clinicians and researchers should put in special efforts to diagnose multimorbidity in senior citizens. More female elderly suffer from multimorbidity, hence such risk

factors should be kept in mind while looking after elderly.

Primary health care should be made more approachable for the senior citizens. Preventive health care strategies and programs specific to the need of the elderly should be formulated and implemented. The geriatric population requires special attention for overall development of the society.

Demographic Variable	N (% Age)
Gender	
Male	244 (45.7%)
Female	290 (54.3%)
Religion	
Hindu	200 (37.4%)
Sikh	331 (62%)
Muslim	3 (0.6%)
Age (In years)	
60-69	379 (70.9%)
70-79	124 (23.2%)
>80	31 (5.8%)
Marital Status	
Currently married	332 (62.1%)
Unmarried	03 (0.5%)
Widow	154 (28.3%)
Widower	45 (8.4%)
Education	
Illiterate	241 (45.1%)
Literate	293 (54.9%)
Socio economic status	
Upper	96 (17.9%)
Upper middle	123 (23%)
Middle	181 (33.8%)
Upper lower	134 (25.09%)
Occupation	
Working	134 (25.09%)
Retired	64 (11.9%)
Business	18 (3.3%)
Household work	318 (59.5%)

Table 1: Demographic Data of study subjects (N= 534)

Category	N (%age)
Underweight (<18.5)	89 (16.7%)
Normal (18.5-22.9)	183 (34.3%)
Overweight (23-24.9)	86 (16.1%)
Obese (≥25)	176 (32.9%)

Table 2: Distribution of subjects according to BMI (kg/m²)

Medical Condition	N=534		Males (%) n=244		Females (%) n=290		p-value
	Number	%age					
Eye problems	364	68.1	167	68.4	211	72.7	0.2758
Hypertension	235	44	94	38.5	158	54.4	<0.001
Respiratory diseases	56	10.4	26	10.6	37	12.7	0.4530
Musculoskeletal disorders	40	7.5	18	7.3	23	7.9	0.8107
Psychological distress	23	4.3	12	4.9	11	3.7	0.5236
Acid peptic disease	206	38.6	81	33.2	139	51.7	<0.001
Anaemia	34	6.4	13	5.3	15	5.1	0.9360
Genitourinary diseases	1	0.2	0	0	2	0.6	0.2333
Cognitive impairment	4	0.75	1	0.4	3	1.0	0.4043
Deafness	11	2.0	4	1.6	10	3.4	0.1928
Stroke	8	1.4	3	1.2	5	1.7	0.6393
Diabetes	59	11	26	10.6	46	15.9	0.0793
Dental problems	15	2.8	5	2.0	9	3.1	0.4475

Table 3: Morbidity pattern of study subjects

*multiple responses obtained

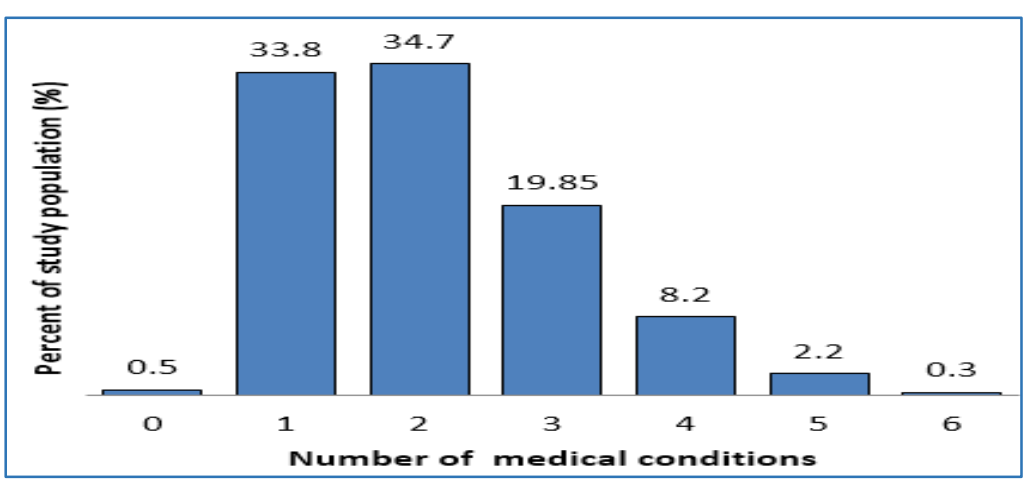

Fig. 1: Distribution of Medical Conditions among Study Subjects

Demographic Variable	Total (%)		Multimorbid Conditions Present (N=352)		Only One Condition Present (N=182)		P value
Age (Years)	**N**	**% Age**	**N**	**% Age**	**N**	**% Age**	
60-69	379	70.9	239	63	140	36.9	0.07826
70-79	124	23.2	89	71.77	35	28.2	
≥80	31	5.8	24	77.4	07	22.5	
Gender							
Male	244	45.7	133	54.5	111	45.5	<0.0001
Female	290	54.3	219	75.5	71	24.5	
Literacy							
Illiterate	241	45.1	158	65.5	83	34.4	0.8744
Literate	293	54.8	194	66.2	99	33.8	
Marital status							
Currently Married	332	62.1	201	60.5	131	39.5	<0.001
Unmarried	03	0.5	02	66.7	01	33.3	
Widow	154	28.3	122	79.2	32	20.77	
widower	45	8.4	27	60	18	40	
Socio-economic status							
Upper	96	17.9	55	57.29	41	42.7	0.0019
Upper middle	123	23	87	70.7	36	29.2	
Middle	181	33.8	134	74	47	25.9	
Upper lower	134	25	76	56.7	58	43.3	
BMI							
Underweight	89	16.6	61	68.5	28	31.5	0.9169
Normal	183	34.2	119	65.0	64	35	
Overweight	86	16.1	55	63.9	31	36.1	
Obese	176	32.9	117	66.4	59	33.6	
Type of family							
Nuclear family	157	29.4	89	56.7	68	43.3	0.003
Joint family	377	70.6	263	69.7	114	30.2	

Table 5: Association of Multimorbidity with socio demographic variables

Health Facility†	N (% Age)
Dispensary	4 (0.7%)
Government hospital	29 (5.4%)
Urban health centre	77 (14.4%)
Private doctor	443 (82.9%)
Registered medical practitioner	22 (4.1%)
Average Medical Expenses Per Month	
Upto Rs. 500	398 (74.5%)
501-1000	112 (20.9%)
1001-1500	23 (4.3%)
1501-2000	1 (0.2%)
Adherence to Pharmacological Intervention	
Yes	508 (95.1%)
No	26 (4.9%)

Table 6: Health care seeking behaviour among study subjects

†multiple responses obtained

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