Assessing Morbidity Profile of Non-communicable Diseases Among Elderly Population in a District of North India – A Cross-sectional Study

Anil Kumar Verma[1], Shweta Kanwal[2*]

[1,2]MD Community Medicine, Faculty, Regional Health and Family Welfare Training Centre, Kangra, India

Abstract: ***Introduction:*** **Elderly population, in India as well as world-wide, is increasing rapidly over the years. Elderly persons, being one of the most vulnerable groups of the society have more chances of chronic disease, infections, as well as disabilities. There is huge mismatch in the urban-rural population and health care system in India. Thus, this study was conducted with the main objective to study morbidity profile of elderly population (rural and urban) in district Kangra, Himachal Pradesh (H.P.).** ***Materials and Methods:*** **This was a community based cross-sectional study, carried out for a period of one year, on 750 individuals and using population proportion size technique (PPS). Data was collected using self-designed semi-structured questionnaire, general physical examination and blood testing and was analysed using SPSS version 24.** ***Results:*** **Low vision (52.2%) was the most common morbidity, followed by hypertension (39.3%), osteoarthritis (34.2%), obesity (31.9%) and bronchial asthma (24.6%). 10.3% had pallor, 0.1% had icterus, 2.1% had cyanosis, 1.3% had clubbing, 5.6% had pedal edema and raised JVP in 1.6% of the total study participants.** ***Conclusion:*** **The study has provided valuable data to plan services and programmes for betterment of geriatric people whose percentage in the population is increasing.**

Keywords: **Elderly, geriatric, morbidity profile, non-communicable diseases, rural, urban.**

1. Introduction

Elderly population, in India as well as world-wide, is increasing rapidly over the years. The proportion of world's elderly population will double from 11% to 22% and number of people aged 60 years and above is expected to reach up to 2 billion in 2050 [1]. In India, the proportion of elderly was 8% in 2012, which is expected to increase to 19% in 2050 [2]. Elderly persons, being one of the most vulnerable groups of the society have more chances of chronic disease, infections, as well as disabilities which means restriction or lack of ability to perform an activity in the manner or within the range considered normal for a human being [3]. The Indian elderly population accounted for 7.4% of total population in 2001 census. This figure increased to 8.6% in 2011 census. It is further projected to rise to 11.1% by the year 2025. Himachal Pradesh a hilly state of North India is also experiencing an elderly population boom (10.2% elderly; census 2011) [4].

One important socio-demographic factor is the rural-urban divide. The national census 2011 states that 833 million people currently live in rural areas [5]. Although the percentage population staying in rural areas has gone down from 2001 (72.19%) to 2011 (68.84%), the sizable majority of India still resides in rural India. A significant majority of them are elders. With such a huge mismatch in the urban-rural population and health care system, geriatric medicine in India faces an uphill task [5].

Majority of elderly in India live and work in the unorganized agricultural sector in rural area. The poor understanding of elderly life under changing economic and social norms in India has led to a weak care and support for them [6]. In India, where recently initiated National Program for Health Care of Elderly (NPHCE) aims to develop infrastructure and built capacity of health care providers for elderly health care, around the world, there is growing concern to achieve sustainable quality of life. The concept of "active aging" has also fostered interest in the well-being and life satisfaction dimension; however, the definition of quality of elderly life and its determinants remained a concern [7].

In the view of all these facts, this study was conducted with the main objective to study morbidity profile of elderly population in district Kangra, Himachal Pradesh (H.P.). This study will help us to understand and evaluate their health problems, so that a comprehensive health-care plan covering all aspects of preventive, promotive, curative, and rehabilitative services can be planned for the care of the elderly residing in this part of the world.

2. Materials and Methods

Study design and area: This was a community based cross-sectional study conducted in district Kangra of Himachal Pradesh (H.P.).

Study duration: The study was carried out for a period of one year (July 2018 to August 2019).

*Corresponding author: shwetakanwal536@gmail.com

Sample size and selection of subject: A total sample size of 750 (rural and urban) was calculated by using formula 4PQ/E2, where P = Prevalence of various morbid conditions among geriatric population (37%), Q= 100-P, E= error of the prevalence (10%) and adding non response rate of 10%. As the population of district resides more in rural than urban. To achieve the desired proportionate sample size of 750 individuals, 25% sample from Urban and 75% sample from rural was considered. Thus, for the purpose of present study, a sample size of 190 for urban and 570 for rural area was calculated.

Inclusion criteria and exclusion criteria: Age 60 years and above and person who gave consent to participate in the study were included in the study. Those who were found to be non-cooperative and were not present at home at the time of visit were excluded from the study.

Selection of clusters: In the rural area, a village was considered as one cluster and villages of Shahpur health block of Kangra district were considered as one cluster. Out of 333 villages, 30 were selected randomly and from these sampled villages 19 individuals were selected from each village by applying population proportion size technique (PPS). For urban area, municipal ward were considered as cluster. 5 wards were selected randomly and from each sampled ward 38 study subjects were selected by applying PPS to complete the sample size of 190 from urban area.

Sampling: First house in the cluster (urban as well as rural) was selected randomly and then adjacent house was visited till the required sample size was completed in that cluster. Only one study subject per household was included in the study, in case there was more than one study subject in a house hold simple random method was applied for the selection of study subject in that household. In case study subject was not available, adjacent house was visited till the required sample size was completed. A house-to-house survey was conducted twice a week in the selected study area. Data on socio-demographic characteristics and history related to various diseases was collected by using a self-administered, self-designed and pretested semi-structured questionnaire. In addition to this, general physical examination (pallor, icterus, cyanosis, pedal edema, clubbing etc.), blood pressure measurement and random blood sugar was also performed to assess the present health condition of the study participants. Socioeconomic status in the urban area was classified by using Kuppuswamy scale and in rural area by Udai Pareek scale.

Ethical permission: The study was conducted after ethical clearance from from Institutional Ethical Committee (IEC) Dr. RPGMC Kangra at Tanda (H.P.).

Data Analysis and Statistics: Data was coded and entered in Microsoft excel and was analysed using SPSS version 24. Categorical data was analysed using frequencies and percentages and Chi square (X2) was used to detect significant difference for proportion and P <0.05 was considered statistically significant.

3. Results

Out of 760 study participants, 331(58.1%) were male respondents in rural area whereas 104 (54.7%) were female respondents in urban area and the difference was found to be statistically significant (p=0.01). All were Hindu by religion. 16.3% and 43.5% belonged to upper class in urban and rural area respectively (table 1).

On general physical examination, 10.3% had pallor, 0.1% had icterus, 2.1% had cyanosis, 1.3% had clubbing, 5.6% had pedal edema and raised JVP in 1.6% of the total study participants. Pallor and pedal edema was found to be more common in the rural population as compared to urban population and the difference was found to be statistically significant (p<0.05) (table 2).
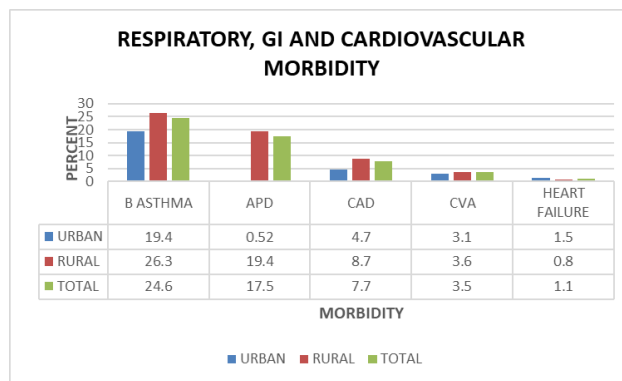

Fig. 1. Morbidity pattern among the study participants based on respiratory, gastrointestinal and cardiovascular system

Hypertension was found among 39.3%, pre-hypertension among 36.3%, obesity among 31.9% (more common in urban area) and diabetes among 13.2% (more common in urban area) of the study participants (table 2). Low vision was found in 52.2%, osteoarthritis in 34.2% and bronchial asthma in 24.6%

Table 1
Sociodemographic characteristics of the study participants (n=760)

Characteristic	Urban N (%)	Rural N (%)	Total N (%)	p value
SEX				
Male	86(45.2)	331(58.1)	417(54.8)	0.01
Female	104(54.7)	239(41.9)	343(45.1)	
RELIGION				
Hindu	190(100)	570(100)	760(100)	-
Others	0(0)	0(0)	0(0)	
SE CLASS				
Upper	31(16.3)	248(43.5)	279(36.7)	
Upper middle	53(27.8)	269(47.1)	322(42.3)	
Lower middle	42(22.1)	53(9.2)	95(12.5)	0.00
Upper lower	54(28.4)	0(0)	54(7.1)	
Lower	10(5.2)	0(0)	10(1.3)	

Table 2
Distribution of study participants based on the clinical examination

Characteristic	Urban N (%)	Rural N (%)	Total N (%)	p value
PALLOR				
Present	2(1.1)	77(13.5)	79(10.3)	0.00
Absent	188(98.9)	493(86.5)	681(89.7)	
ICTERUS				
Present	1(0.5)	0(0.0)	1(0.1)	0.08
Absent	189(99.5)	570(100)	759(99.9)	
CYANOSIS				
Present	1(0.5)	15(2.6)	16(2.1)	0.08
Absent	189(99.5)	555(97.4)	744(97.9)	
JVP				
Raised	1(0.5)	11(1.9)	12(1.6)	0.17
Not raised	189(99.5)	559(98.1)	748(98.4)	
CLUBBING				
Present	1(0.5)	9(1.6)	10(1.3)	0.27
Absent	189(99.5)	561(98.4)	750(98.7)	
PEDAL EDEMA				
Present	1(0.5)	42(7.3)	43(5.6)	0.00
Absent	189(99.5)	528(92.7)	717(94.4)	
HYPERTENSION				
Normal	42(22.1)	143(25.1)	185(24.3)	
Pre-Hypertension	72(37.8)	204(35.7)	276(36.3)	0.74
Stage 1	40(21.0)	128(22.4)	168(22.1)	
Stage 2	36(18.9)	95(16.6)	131(17.2)	
BMI				
Normal	70(36.8)	240(42.1)	310(40.7)	
Overweight	27(14.2)	101(17.7)	128(16.8)	0.00
Obese	84(44.2)	159(27.8)	243(31.9)	
Underweight	9(4.7)	70(12.2)	79(10.3)	
DIABETES				
Yes	27(14.2)	74(12.9)	101(13.2)	0.66
No	163(85.7)	496(87.1)	659(86.7)	

of the study participants. Most of the morbidities were found to be more common among rural population (figure 1 and 2) among which APD, osteoarthritis, rheumatoid arthritis and vision related problems were more common in rural area as compared to urban area and the difference was found to be statistically significant (p=0.03, 0.00, 0.04 and 0.00 respectively).
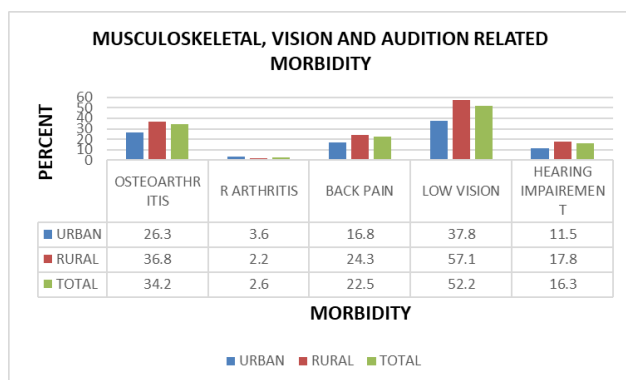

Fig. 2. Morbidity pattern among the study participants based on musculosketal, vision and audition problems

4. Discussion

Aging is a complex, multifactorial and inevitable process that begins before birth and continues throughout the life. It is an inevitable truth that older people in Indian society has been well perceived. Although age pyramid with wider top obviously narrates a success story of socioeconomic development and good public health practice in country, there is need to know the problem burden comprehensively [8].

The participants in our study were predominantly from rural area (75%) as compared to urban area (25%) and most of the respondent in urban area were females (54.7%) as compared to rural area where 58.1% were male participants.

On general physical examination, pallor was found in 10.3%, more common in rural area (13.5%) as compared to urban (1.1%). Also pedal edema was found in 5.6%, more common in rural (7.3%) as compared to urban (0.5%). Such results are pointing towards malnutrition which is more common in rural area due to poverty, insanitation and trend of consuming only two meals a day with long periods of fasting in between.

In our study, total prevalence of hypertension was found to be 39.3%, 39.9% among urban population and 39.1% among rural population. Almost similar results were found in other studies too. In a study by Aggarwal N et al., [9], the prevalence of hypertension among rural and urban geriatric population was 36.8% and 43.1% respectively. In a study by Kishore S et al., [10], prevalence of hypertension in elderly persons was 41.4%. In a study by Swami HM et al., [11], the prevalence of hypertension amongst geriatric population in urban area was 61.3% and 36.7% in rural area respectively with a total prevalence of 58%.

In our study, in urban area 36.8% had normal BMI, 14.2% were overweight, 44.2% obese and 4.7% were underweight, which is lower than that reported by different investigators. Swami HM et al., [11] found that prevalence of overweight was 33.1%, preobesity 25.4% and obesity 7.5% among elderly. A similar study by Rajmal R et al., [12] had reported the prevalence of overweight and obesity to be 46%. Another study by Singh P et al., [13] found nearly 36% of the elderly to be overweight and obese. In rural area 42.1% participants had

normal BMI, 17.71% were overweight, 27.8% obese and 12.2% underweight. The study conducted by Binu J et al., [14] revealed overall a high prevalence of overweight (44%) and obesity (10%). In males, 35% were overweight and 11% were obese, while in females 49% were overweight and 9% were obese.

In our study, the prevalence of diabetes mellitus was 13.2%, 14.2% in urban and 12.9% in rural area. Similarly in a study conducted by Banker K et al., [15] in urban and periurban area of Ahmedabad observed that the prevalence of diabetes mellitus was 14.9% with 16.5% prevalence amongst males and 13.6% amongst females, also a community based cross sectional study by Sharadha K et al., [16], DM was observed in 13.9% of elderly.

In our study, prevalence of bronchial asthma was 24.6%, more common in rural area (26.3%) as compared to urban (19.4%). In contrast to this, in a study by Pathak G et al., [17] respiratory diseases were found in 8.7% and bronchial asthma in 2% and a study conducted by Kumar D et al., [18] reported a 3.7% prevalence of bronchial asthma. Higher prevalence in our study can be attributed to high indoor pollution (use of chullah) in our region.

In our study, Acid Peptic Disease (APD) was found among 17.5% of the total participants, 0.5% in urban area and 19.5% in rural area. The high prevalence of APD in rural area might be due to the spicy cultural and traditional food of this area and the trend of long periods of fasting in between the meals. In contrast to this, according to the study by Swami HM et al., [11], prevalence of heartburn was reported as 17.2% with 18.2% prevalence in urban area and 4.3% prevalence in rural area.

In our study, CVA cases were almost equal in both the areas 3.6% and 3.1% in urban & rural area respectively, which is higher than the similar study conducted by Sharma D et al., [19] in the Himachal Pradesh state. The attributable difference within state is because they had conducted the study in the hilly area having different eating habits and more physical activity. Swami HM [11] reported prevalence of stroke as 2.2% in elderly with prevalence of 2.2% in urban area and 2.1% in rural area. Singh P et al., [20] observed prevalence of stroke as 2.8% in rural area of Jammu with 4.1% of males and 1.7% females.

Participants suffering from osteoarthritis & back pain was more in rural area 36.8% & 24.3% in comparison to urban area 26.3% & 16.8% which could be due to more involvement of rural population in physical work. Rheumatoid arthritis was observed in 2.2% and 3.6% in rural & urban area respectively. As per a study by Swami HM et al., [11], the prevalence of osteoarthritis was 50.5%, 50.8% and 49.0% in urban and rural area respectively. They observed back pain amongst 17.4% elderly with prevalence of 15.3% amongst urban residents and 30.6% amongst rural residents.

Others conditions such as audition problem was prevalent in 11.5% in urban area & 17.8% in rural area. The ear problems were less prevalent in our region as compared to other studies, possible reason can be due to better health facilities. Piramanayagam A et al., [21] observed that 23.3% were affected by ear diseases; 1.8% of which suffering from reduced hearing, 42.1% were men and 57.8% were women. Swami HM et al., [11] reported prevalence of hearing loss amongst elderly as 13.4% with all cases in urban area and none in rural area.

Strength and weakness of study: Our study was a novel study which had not been conducted in the past under similar settings. It provided comprehensive information about the burden of different medical problems in elderly population in study area. As sample size calculation was based on general morbidity pattern, results may not be applicable for geriatric problems with lower prevalence. Also, complete spectrum of sociodemographic variables could not be covered. Since this study was conducted among the elderly population residing in the hilly area of North India the findings of the study cannot be generalized to the other elders of India.

5. Conclusion

In our study, low vision (52.2%) was the most common morbidity, followed by hypertension (39.3%), osteoarthritis (34.2%), obesity (31.9%) and bronchial asthma (24.6%). Majority of the morbidities were more common in rural area. The study has provided valuable data to plan services and programmes for betterment of geriatric people whose percentage in the population is increasing. There is need to strengthen capacity of health services in dealing with elderly through development of preventive and promotive care, training of medical and para-medical professionals in geriatric medicine, improving medical rehabilitation and therapeutic interventions in geriatrics especially in the rural area.

References

[1] Facts on ageing and life course. WHO ageing and life course. [Internet] Last accessed on 01-06-2023. Available from https://www.who.int/news-room/fact-sheets/detail/ageing-and-health

[2] Population ageing and development, 2015. United Nations Population Division. [Internet] Last accessed on 01-06-2023. Available from: https://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2015_Report.pdf

[3] International Classification of Impairment, Disabilities, Handicaps. Geneva: World Health Organization; 1980.[Internet]Last accessed on 01-06-2023. Available from: https://apps.who.int/iris/bitstream/handle/10665/41003/9241541261_eng.pdf?se-quence=1

[4] Mahajan A, Ray A. The Indian elder: factors affecting geriatric care in India. Glob J Med Public Health. 2013;2:1-5.

[5] C. Chandramouli. Census of India (2011). Rural Urban Distribution of Population. [Internet]Last accessed on 02-06-2023. Available from: http://censusindia.gov.in/2011-prov-results/paper2/data_files/india/Rural_Urban_2011.pdf

[6] Dey AB. Strategy for development of old age care in India. J Indian Acad Geriatr. 2006;2:146.

[7] Smith AE. Quality of life: A review. Educ Aging. 2000;15:41935.

[8] Kumar R, Bahal SP, Srivastava A. Morbidity pattern of geriatric population in rural areas of western Uttar Pradesh. Int J Med Sci Public Health.2016;5:430-433.

[9] Agrawal N, Imtiaz D, Singh AK et al. Lifestyle associated morbidity among geriatric population-urban and rural comparison. Int J Community Med Public Health.2018;5:3559-66.

[10] Kishore S, Juyal R, Semwal J et al. Morbidity profile of elderly persons. JK Sci.2007;9:87-9.

[11] Swami HM, Bhatia V, Dutt R et al. A Community Based Study of the Morbidity Profile among the Elderly in Chandigarh, India. Bahrain Med Bull.2002;24(1):13-6.

[12] Rajmal R, Singh Z, Stalin P et al. Prevalence and determinants of overweight and obesity among elderly population in an urban area of puducherry. Int j med sci public health.2015;4:369-72.

[13] Singh P, Kapil U, Dey AB. Prevalence of overweight and obesity amongst elderly patients attending a geriatric clinic in a tertiary care hospital in Delhi, India. Indian J Med Sci.2004;58:162-3.

[14] Binu J, Harnagle R. A study on the prevalence of overweight and obesity and its influencing factors among rural geriatric population in Kerela. Int. J. Curr. Microbiol. App. Sci 2014;3(9):284-93.

[15] Banker K, Prajapati B, Kedia G. Study of health profile of residents of geriatrics home in Ahemdabad district.Nat.J.Com. Med.2011;2(3):378-82.

[16] Shraddha K, Prashantha B, Prakash B. Study on morbidity pattern among elderly in urban population of Mysore, Karnataka, India Int J Med Biomed Res. 2012;1(3):215-223.

[17] Pathak G, Kalita D, Deka B. Study on morbidity pattern among elderly in urban area of Barpeta, Assam, India. J Family Med Prim Care. 2022;11:553-8.

[18] Kumar D, Mittal PC, Sharma MK et al. Determinants of psycho-social health conditions of elderly in urban area of Allahabad. J Indian Acad Geriatr.2007;3:57-63.

[19] Sharma D, Mazta SR, Prashar A. Morbidity Pattern and Health-seeking Behavior of Aged Population residing in Shimla Hills of North India: A Cross-Sectional Study. J Family Med Prime Care.2013;2(2):188-93.

[20] Singh P, Gupta RK, Jan R et al. Morbidity profile of Rural Geriatric Population in North India: A Community Based Cross-sectional Study. JK Science.2016;18(2):98-102.

[21] Piramanayagam A, Bayapareddy N, Pallavi M et al. A cross sectional study of the morbidity pattern among the elderly people South India. International Journal of Medical Research & Health Sciences.2013;2:372-79.