

Original Article

An Epidemiological study to assess morbidity profile among geriatric population in District Dehradun.

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Abstract:

Introduction: The world is ageing, it is natural and inevitable. The risk of having at least one chronic disease, such as hypertension, diabetes, arthritis, cancers increases with age, this is not so much a function of chronological age *per se* but a reflection of the life-long accumulation of risk factors. Further, obesity increases the risk of numerous non communicable diseases viz. cardiovascular diseases, diabetes and hypertension etc. So study was planned to find out the morbidity profile of geriatric population (≥ 60 years) in District Dehradun.

Methodology: A cross sectional study was conducted in Doiwala Block (rural) & Dalanwala (Urban) area of District Dehradun of Uttarakhand Dehradun (Uttarakhand) to assess the health status of elderly population during April - June 2010. Study had attempted to include all the households and residents of the study areas who were above 60 years of age.

Results: Working geriatric study group involved in livelihood were found to be less morbid as compared to retired or Homemaker (i.e. housewives). Among non-working group higher prevalence of non communicable disease viz CVS (16.4%), hypertension (38.6%), diabetes (17.7%), arthritis (21.2%), asthma (7.7%), cataract (17.5%) & BPH (12.2%) was observed as compared to working group. Morbidities were more common among obese viz. hypertension (39.1%), CVS diseases (26.1%), diabetes (10.0%) and high risk WHR (47.8%). Hypertension (I & II) is more common (36.1%) amongst geriatric person with BMI of more than 25 and above as compared to BMI less than 25 (25%).

Conclusion: Present study observed higher prevalence of cardiovascular morbidity, arthritis & cataract among non working group as compared to working group. Present study also shows higher BMI also increases the high risk factors for non communicable disease.

Keywords: NCD, Geriatric, Morbidity, Working & non working group

Introduction:

The world is ageing, it is natural and inevitable. With people living longer and fewer children being born, the absolute number of older people is increasing. Increased longevity is a triumph for public health and the result of social and economic development but with longevity, exposure to known and unknown health risks is longer and the impact of biological decline of ageing is greater in later life¹. The risk of having at least one chronic disease, such as hypertension, diabetes, arthritis, cancers increases with age, this is not so much a function of chronological age *per se* but a reflection of the life-long accumulation of risk factors². Changes in body composition which mark the onset of the ageing process include decline in lean body mass and increase in adipose tissue. A high prevalence of iron deficiency anaemia has also been reported among Indian elderly³.

Obesity is increasing both in developed as well as developing nations⁴, the underlying cause is the undesirable positive energy balance⁵. Obesity increases the risk of numerous non communicable diseases viz. cardiovascular diseases, diabetes and hypertension etc.

Objective:

To study the morbidity profile of geriatric population (≥ 60 years) in District Dehradun.

Methodology:

A cross sectional study was conducted in Doiwala Block, Dehradun (Uttarakhand) to assess the health status of elderly population in rural setup in phase I. There were 168 villages in Doiwala block, one village, Dharmuchak was randomly selected. Study was conducted in March – April, 2010. All the households and residents of the village who were above 60 years of

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age at the time of study were included in study. There were 122 individuals aged ≥ 60 years.

The survey used the validated WHO STEP wise approach to surveillance questionnaire⁶ and included information on tobacco use, diet, physical activity, weight and blood pressure. The questionnaire was pretested and modified to fit Indian conditions after pilot testing on a subpopulation in both the areas. Data were also collected on the age, sex, level of education, occupation and health status and risk factors for emerging diseases of each participant. Data was collected using mentioned tool questionnaire through interview method by trained investigators.

Biological and anthropological risk factors were assessed by measuring the height, weight and blood pressure of each participant. The BMI (kg/m^2) was calculated from the height and weight of each participant. Blood pressure was recorded in the right arm, in a sitting position, to the nearest 1 mmHg, using a digital sphygmomanometer (OMRON-MX2 with adult size cuff). Two readings were taken 5 minutes apart and the mean of the two was taken as the blood pressure.

The results obtained in the rural study motivated the investigators to plan a similar study in the urban area as an extension (Phase II) of this study.

In Phase II, a similar study was planned to compare rural geriatric population belonging mostly to illiterate lower socio economic group with urban population mostly belonging to literate & upper socioeconomic status.

This study was conducted in Urban (Dalanwala) area of District Dehradun of Uttarakhand, during April - June 2010. A similar comparative sample of 122 individuals aged ≥ 60 years were registered in the study area by systematic random sampling method.

The survey population was pre-informed about the objectives of survey. After taking informed consent, a pre-designed, pre-tested closed ended questionnaire was used for conducting this study, through interview method on individual basis by trained investigators. Study had attempted to include all the households and residents of the study areas who were above 60 years of age. Only those individuals willing to participate in the study were selected till the requisite sample size was achieved.

Further, a blood sample was also collected from the volunteered participants and some baseline lab

investigations were also done i.e. Hemoglobin, Blood Sugar, Serum Cholesterol, as in rural study.

The collected information was entered in the computer and analyzed by using SPSS software. Thus proportions & Chi-square test were calculated ($p < 0.05$). The data obtained from the two geriatric groups i.e. Dehradun – Rural (Dharmuchak) and Dehradun – Urban (Dalanwala) was compiled to assess the health and socio economic indicators.

Results:

Working geriatric study group (i.e. government & non government employed or self employed group) involved in livelihood were found to be less morbid as compared to retired or homemaker (i.e. housewives).

Among non-working group higher prevalence of non communicable disease viz CVS (16.4%), Hypertension (38.6%) Diabetes (17.7%), Arthritis (21.2%), Asthma (7.7%), Cataract (17.5%) & BPH (12.2%) was observed as compared to working group. Among non working group, retired person were having higher morbidities viz. cardiovascular, BPH, hypertension, asthma, cataract, arthritis & diabetes as compared to homemakers.

Retired/home makers were having significant higher morbidities due to cardiovascular system, arthritis & cataract while difference was not significant among working & non working group for hypertension, diabetes, asthma & BPH (Table I)

Among non working group higher BMI (35.9%) i.e. more than 25.0 was observed as compared to working group (14.6%). Overall prevalence of BMI - 25 and above was 31.4% among study group. Higher morbidity among non working group can also be correlated with higher BMI i.e. overweight of 71.4% and 20.4% & obesity of 47.8% and 39.1% among retired and homemaker group respectively.

(Table-II)

Hypertension was the commonest morbidity among all age groups. Hypertension (30.6%) was more common in 60-70 Yrs age group followed by diabetes (15.3%), arthritis (14.0%) & CVS morbidities (14.0%), cataract (9.6%) and BPH (8.3%). Among 71-80 years, Hypertension (28.7%) followed by arthritis (16.7%) and cataract (15.7%), Diabetes (11.1%) & BPH (11.1%), CVS morbidities (9.3%). Stroke was more commoner between 71-75 years as compared to 60-70 years or more than 80 years.

Table 1: Morbidity Profile of Geriatric study population Vs Occupation in District Dehradun.

Group	Occupation	CVS morbidity		Hypertension		Diabetes		Arthritis		Asthma		Cataract		BPH	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Working	Gov /Non Gov/ Self employed	2 (3.6)	53 (96.4)	14 (25.5)	41 (74.5)	5 (9.0)	50 (91.0)	3 (5.5)	52 (94.5)	2 (3.6)	53 (96.4)	3 (5.5)	52 (94.5)	4 (7.3)	51 (92.7)
Non Working	Homemaker /Retired	31 (16.4)	158 (83.6)	73 (38.6)	116 (61.4)	33 (17.7)	156 (82.5)	40 (21.2)	149 (78.8)	13 (7.7)	156 (92.3)	33 (17.5)	156 (82.5)	23 (12.2)	166 (87.8)
Total		P=0.0269		P=0.0801		P=0.1952		P=0.0128		P=0.5741		P=0.0462		P=0.4386	

Table 2: Obesity of geriatric study population Vs occupation in District Dehradun

Group	Occupation	BMI Category (kg/m ²)		Total	P value*
		≤24.99	≥25.00		
Working	Gov /Non Gov/ self employed	41(85.4%)	7(14.6%)	48	0.0048
Non Working	Homemaker/Retired	116(64.1%)	65(35.9%)	181	
	Total	157(68.5%)	72(31.4%)	229	

* Fisher's exact test- two- tailed

Table 3: Age wise morbidity profile of Geriatric study population in District Dehradun.

Age Category (in Years)	Morbidities								Total Morbidity
	CVS morbidity	Hypertension	Stroke	Diabetes	Arthritis	Asthma	BPH	Cataract	
60-65	13 (16.3)	26 (32.5)	2 (2.5)	14 (17.5)	11 (13.8)	2 (2.5)	7 (8.8)	5 (6.3)	80(28.2)
66-70	9 (12.2)	22 (29.7)	1 (1.4)	10 (13.5)	11 (14.9)	5 (6.8)	6 (8.1)	10 (13.5)	74 (26.1%)
71-75	7 (10.0)	19 (27.1)	3 (4.3)	8 (11.4)	13 (18.6)	3 (4.3)	7 (10.0)	10 (14.3)	70 (24.6%)
76-80	3 (8.1)	12 (32.4)	1 (2.7)	4 (10.8)	5 (13.5)	0 (0.0)	5 (13.5)	7 (18.9)	37 (13.0%)
80-85	1 (6.3)	5 (31.3)	0 (0.0)	0 (0.0)	3 (18.8)	2 (12.5)	2 (12.5)	3 (18.8)	16 (5.6%)
86-90	0 (0.0)	3 (3.4)	0 (0.0)	1 (14.3)	0 (0.0)	2 (28.6)	0 (0.0)	1 (14.3)	7 (2.5%)
Total	33 (11.6)	87 (42.9)	7 (2.5)	37 (13.0)	43 (15.1)	14 (4.9)	27 (9.5)	36 (12.7)	284
P value	.912	.401	.604	.781	.103	.007	.226	.008	

Table 4: High risk profile of geriatric study population in relation to BMI in District Dehradun.

Hypertension Category (mm. of Hg.)	BMI Category		Total	P value*
	≤24.9	≥25		
Normotensive (<120 mm Hg)	58(63%)	23(37%)	81 (40.5%)	0.0728
hypertensive (≥120mm Hg)	70(58.8%)	49(41.2%)	119(59.5%)	
CVS Disease				
Present	16 (50%)	16(50%)	32 (14.0)	0.0227.
Absent	141(71.6%)	56(28.4%)	197 (86.0)	
Blood Glucose Level				
Desirable (< 200 mg/dl)	102(68.5%)	47(31.5%)	149 (82.3)	0.0138
Undesirable(≥200 mg/dl)	14(43.7%)	18(56.3%)	32(17.7%)	
Waist –Hip ratio				
Low risk (Male 0.95or below, Female -0.80 or below)	95(81.2%)	22(18.8%)	117 (51.3%)	0.0001
Increased risk (Male >0.96 , Female >0.81)	62(55.9%)	49 (4.1%)	111(8.7%)	

While in 81-90 years age group hypertension (33.3%) followed by asthma(16.7%) & cataract (16.7%), arthritis (12.5%) and diabetes, CVS morbidities & COPD are 4.2% each. Overall morbidity due to hypertension(29.4%) remains high followed by arthritis (15.6%),diabetes (12.8%), cataract (12.5%), CVS morbidities (11.4%) & BPH (9.3%). Significant difference though was observed for asthma & cataract only (Table-III).

Among group with BMI of more than 25 i.e. pre- obese & obese, morbidity due to cardiovascular system(50%), blood glucose level(56.3%) & Waist Hip ratio (44.1%) was higher, difference was statistically significant.

Further analysis found that morbidities was more common among obese viz. hypertension (39.1%), CVS diseases(26.1%), diabetes(10.0%) and high risk WHR(47.8%). Hypertension (I & II) was more common (36.1%) amongst geriatric person with BMI of more than 25 and above as compared to BMI less than 25 (25 %) while random blood sugar level of ≥200 mg/dl was more (27.7%) amongst BMI of more than 25 and above as

compared to geriatric person (12.1%) with blood sugar of <200mg/dl in person with BMI of less than 25.

Discussion:

Working geriatric study group (i.e. Government & non government employed or self employed group) involved in livelihood were found to be less morbid as compared to retired or homemaker (i.e. housewives). Employment history has also been shown to be associated with hypertension in other studies⁷⁻⁹. It is possible that better occupational opportunities provide better health access as better occupations can provide better education which can ultimately influence lifestyle, dietary habits and physical exercise by increasing the awareness of the effects of good health.

Among total cardiovascular patients maximum morbidity were from retired group (81.8%) followed by homemaker group (12.1%), similarly BPH (81.5%), hypertension (66.6%), asthma (73.3%), cataract (72.2%), arthritis (62.8%), diabetes (60.5%) were more in retired geriatric person followed by homemaker group.

As per WHO classification, 21.4% overweight & 10.0% obese were there in current study as compared to Swami et al⁴ who reported 25.41% and 7.54% of elderly, respectively.

Higher morbidity among non working group can also be correlated with higher BMI i.e. Overweight of 71.4% and 20.4% & Obesity of 47.8% and 39.1% among retired and homemaker group respectively.

Hypertension(42.9%) was the commonest morbidity among all age groups, which was lower than 59.1% as reported by Lena A et al¹⁰, similarly other studies viz. 53.5% by Datta et al¹¹, 58% by Parray et al¹² and Swami et al¹³ and 48% by Prakash et al¹⁴ also reported higher prevalence while Gurav R.B., Kartikeyan S¹⁵ & Khokkar A et al¹⁶ reported lower prevalence of 16.34% & 37.5% respectively.

Hypertension (30.6%) was more common in 60-70 Yrs age group followed by Diabetes (15.3%), Arthritis (14.0%) & CVS morbidities(14.0%), Cataract (9.6%) and BPH (8.3%). Among 71-80 years, hypertension (28.7%) followed by arthritis (16.7%) and cataract (15.7%), diabetes (11.1%) & BPH (11.1%), CVS morbidities (9.3%).

This study indicates lower prevalence of arthritis (17.6%) among geriatric study group as compared to 41.3% as described by Lena A et al¹⁰ while prevalence of diabetes (15.6%) was higher than 10.3% as reported by Lena A et al¹⁰.

Stroke was more commoner between 71-75 years as compared to 60-70 yrs or more than 80 years. While in 81-90 years age group hypertension (33.3%) followed by asthma(16.7%) & , cataract (16.7%), arthritis (12.5%) and diabetes, CVS morbidities & COPD are 4.2% each. Higher morbidity was also noticed by Parray SH et al among higher age group¹². Morbidities were more common among obese viz. hypertension (39.1%), CVS diseases(26.1%), diabetes(10.0%) and high risk WHR(47.8%). Hypertension (I & II) was more common(36.1%) amongst geriatric person with BMI of more than 25 and above as compared to BMI less than 25 (25 %) while random blood sugar level of ≥ 200 mg/dl was more (27.7%) amongst BMI of more than 25 and above as compared to Geriatric person (12.1%) with blood sugar of <200 mg/dl in person with BMI of less than 25 similar to Goyal P et al⁵. As per JNC¹⁷ for BMI between 25-29.9 relative 10 year risk for diabetes (5.6), Hypertension (2.4), Heart Disease (1.7), While for BMI above 30 relative 10 year risk increases for chronic diseases viz. diabetes (18.2), hypertension (3.8), heart disease (2.2).

Conclusion:

Adoption of healthy lifestyles by all persons is critical for the prevention of Non communicable diseases and is an indispensable part of the management of those with chronic disease. Present study observed significantly difference in prevalence of cardiovascular morbidity, arthritis & cataract between working & non working group. These differences could be due to higher BMI observed among non-working group. Present study also shows that higher BMI also increases the high risk factors for non communicable disease. So it is advisable to adopt healthy lifestyle as weight loss of as little as 10 lbs (4.5 kg) reduces BP and/or prevents hypertension in a large proportion of overweight persons. Lifestyle modifications reduce BP, prevent or delay the incidence of hypertension, enhance antihypertensive drug efficacy, and decrease cardiovascular risk.

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