



Prevalence of Hypertension and Diabetes Mellitus Among Geriatric Women of Rural Maharashtra in India

KEYWORDS

Geriatric; Morbidity; Rural, Hypertension, Diabetes

Dr. Sunita Patel

Resident, Department of Community Medicine, Jawaharlal Nehru Medical College, Sawangi (M), Wardha, Maharashtra, India

Dr. Abhay Mudey

Professor and Head, Department of Community Medicine, Jawaharlal Nehru Medical College, Sawangi (M), Wardha, Maharashtra, India

Dr Smrutiranjana Nayak

Assistant Professor, Department of Community Medicine, Jawaharlal Nehru Medical College, Sawangi (M), Wardha, Maharashtra, India

Dr. Meenakshi Khapre

Associate Professor, Department of Community Medicine, Jawaharlal Nehru Medical College, Sawangi (M), Wardha, Maharashtra, India, * Corresponding Author

ABSTRACT *The geriatric population is defined as population aged 60 years and above. Ageing is becoming a social problem, particularly in the rural regions. The considerable proportion that is 48.2% of elderly population are women, who are most vulnerable but never been focused or carefully studied. Study was performed specially in rural geriatric women, focusing on their socio-economic and health status.*

Objectives: To assess the hypertensive and diabetes morbidity pattern in geriatric women and its correlation with socio-demographic condition of participant. **Methodology:** A community based cross sectional study. **Results:** A major fraction of the population was in the age group of 60-69 years old, while a small fraction (7.69%) were 80 years old or older. 30.38% elderly women had hypertension. 10.50% of elderly were found to have diabetes. among diabetic (19), 31.58% were affected by hypertension and 36.85% comes under pre-hypertension stage but there was no significant association observed.

INTRODUCTION

Ageing is a process that converts healthy adults into frail ones, with diminished reserves in most physiological system and an exponentially increasing vulnerability to most diseases and to death.⁽¹⁾ The physiological decline in ageing refers to the physical changes an individual experiences because of the decline in the normal functioning of the body resulting in poor mobility, vision, hearing, inability to eat and digest food properly, a decline in memory, the inability to control certain physiological functions and various chronic conditions. **National Policy on Older Persons** defines "senior citizen" or "elderly" as a person who is 60 years old or above. ⁽²⁾ By the year 2025, the world will host 1.2 billion people aged 60 and over and rising to 1.9 billion in 2050. ⁽³⁾ The population of people aged 60 years or above is likely to increase to 18.4% of the total population in India by the year 2025. ⁽⁴⁾ In the developed world the fertility rate has come down drastically along with mortality rate with a vastly increased life expectancy. In India; the elderly people suffer from communicable, non-communicable diseases as well as nutrition related disease. In India the recent data with ICMR-INDIA DIABETES (ICMRINDIAB) study in 2011 reported the prevalence of DM in 4 regions of country as 10.4% in Tamil Nadu, 8.4 % in Maharashtra, 5.3 % in Jharkhand and 13.6 % in Chandigarh. ⁽⁵⁾ The prevalence of hypertension of 33% corresponds to Sample Registration System (SRS) report saying one in three among rural elderly have hypertension. ⁽⁶⁾ Women are also more likely than men to live to very old age when disabilities and multiple health problems are more common. ⁽⁷⁾ Therefore there is a specific need to evolve women-specific policies and programmes.

Hence, this study was thus conducted with the objectives to study the prevalence and socio demographic correlates of hypertension and diabetes among rural geriatrics women and to recommend measures to improve their condition.

MATERIALS AND METHODS

Present study was carried out over a period of 2 year from September 2013 to October 2015. The study subjects included elderly women aged 60 years and above belonging to the rural field practice area of the Department of Community Medicine, a Medical College located in central India. It was a community based cross sectional study covering 260 elderly.

Study tool was a pre-structured & pre-tested questionnaire executed through house to house visits and followed by on the spot clinical examination and blood investigation. Blood pressure was measured using a mercury sphygmomanometer and the auscultator method. Hypertension was classified using JNC VII criteria as shown in table. ⁽⁸⁾ The study subjects were screened by estimating random blood sugar (RBS) values from capillary blood using a portable glucometer. Elderly having reading greater than 110 mg/dl were assessed after overnight fast on another appointed day for fasting (8 hours of overnight fast) and postprandial (2 hours) blood test. Diabetes was classified as per WHO criteria. ^(9,10)

The informed consent was obtained and care was taken to ensure privacy and confidentiality. Data was analysed using software SPSS 17.0 and appropriate statistics were applied wherever possible.

RESULTS

Socio-demographic characteristics

Table 1 shows that a major fraction of the population was in the age group of 60-69 years old, while a small fraction (7.69%) were 80 years old or older. 40.77% of elderly women were widow. 43.07% of elderly women were living in joint families followed by 36.93% in nuclear families and 20% living alone. 78.85% of elderly were illiterate. Majorities (46.15 %) of elderly women were indulged in labor or unskilled worker (37.3%), semiskilled (1.54%) and shop owner and farmer were 7.31%. Majority of elderly women belonged to class IV and V (43.46%) followed by class III (36.15%) and class I and II (20.39%).

Table 2 shows classification of blood pressure in elderly. 30.38% elderly women had hypertension. After excluding known hypertensive (47) elderly, out of rest (213) elderly women 111 (52.11%) were normal and 70 (32.86%) in pre hypertensive stage. Among hypertensive elderly (30.38%), 18.07% (59.49% of total hypertensive) knew their status of hypertension whereas 12.30% (40.50% of total hypertensive) elderly were unaware of their status.

Table 3 shows Out of total 260 study subjects 14 (5.38%) were previously diagnosed as diabetic. Random blood sugar level was ≤ 110 in 79 elderly women. They were not further investigated as they were considered normal. In 246 participants, 2.03% were revealed as diabetic on screening and their random blood sugar levels were >200 . among total diabetic (19), 26.3 % were newly diagnosed in study.

Table 4 shows relation between diabetes and hypertension. Among diabetic (19), 26.31% were affected by stage 1 hypertension and 5.26% stage 2 hypertension. 36.85% came under pre-hypertension stage. P value was 0.337. Thus no significant association was observed.

Table 5 shows 25.62% hypertension 60-69 years age group and 45% above 80 years. Hypertension observed more in widow (36.36%) than married (26%). Hypertension was more in illiterate (31.21%) than literate (27.27%). Elderly women among joint family (33.92%) and upper class (35.84%) affected more than singular (25%) and lower class (30.97%). Significant association was found with unemployed elderly (37.85%) than employed (21.66%). In present study 6.25% were in 60-69 age group diabetes and 10% were 80 and above. Widows were more diabetic than married. There was significant association of family pattern with diabetes. Joint family (11.60%) elderly women were more prone to diabetes than nuclear (2.08%) or single (7.69%) elderly women. Participants belong to class I and II (16.98%) were more diabetic than class IV and V (6.19%). Diabetes was found to be significantly more in unemployed (sedentary) than employed (mostly laborer).

DISCUSSION

SOCIO-DEMOGRAPHIC PROFILE

The present study covered 260 elderly women of which 61.54% belong to **age group** of 60-69 years and 7.69% were 80 years and above. Thus, a decreasing proportion of elderly women with increase in age was noted analogous to **census 2011**⁽¹¹⁾.

Marital status of study population correlates with data of **census 2011**. In contrast to our study, **Lena et al**⁽¹²⁾ found 25.6% married, 6.6% separated and 67.7% widow elderly women. These studies were performed in southern states, where widowhood is more than northern states. Increasing life expectancy and age gap between men and women during marriage may be the cause of widowhood.

Comparable to study data, NSSO Survey on Condition of Aged (2004) shows 40% of elderly female live with their spouse (nuclear type); about half of aged women live with their children (joint type) and 7-8% live alone.⁽²⁾ The higher prevalence of joint families could be because of the rural study area and social migration of the youngsters being less when compared with cities.

The low literacy status may be attributed to the area being rural; it is in accordance with NSSO employment-unemployment survey (2007-08) 50% elderly men and 20% women literate through formal schooling.⁽²⁾

Both population census 2001 and NSSO survey on employment-unemployment survey (2007-08) revealed that nearly 40% of person aged 60 years and above (60% of men and 19% of women) were working. In rural 66% elderly men and 23% elderly women still participate in economic activity.⁽²⁾

The Study shows that nearly half of disease burden of hypertension is undiagnosed and is at risk of its complications. Similar findings were reported in **GOI & WHO** multi-centric study (2007) in India where among total hypertensive (31.8%), nearly half (15.7% of total study subjects) were aware of their hypertensive status.⁽¹³⁾ Study in rural Wardha by **Deshmukh et al (2005)**⁽¹⁴⁾ reported 38.7% of elderly had hypertension. **Shraddha K et al (2012)**⁽¹⁵⁾, **Rakesh Kumar and Mohammed Shafee (2014)**⁽¹⁶⁾ observed similar results. While other studies^(17,12) shows **very high prevalence upto 60 %**. The differences in prevalence of hypertension may be attributed to different setting area and change life style of participants. Higher prevalence of Hypertension was found in elderly female belong to later age group, widowhood, illiterate, joint family and upper class. Unemployed elderly were significantly more affected with hypertension due to sedentary life style and dietary habits.

Study by GOI & WHO, a multi-centric study in India reported the prevalence of diabetes as 13.3% and 9.8% in urban and rural area respectively.⁽¹³⁾ These findings were in nearly accordance with the current study. The percentages of elderly women had diabetes nearly consistent with studies of **Garg et al (1982)**,⁽¹⁸⁾ **Lena et al (2009)**,⁽¹²⁾ **S.K. Gupta et al (2012)**⁽¹⁹⁾ which reports 4.2%, 9%, 11% respectively. Community based (geriatric population in urban area of Chandigarh) study by **Sharma et al (2005)**⁽²⁰⁾ showed prevalence of diabetes as high as 25.5%. These variations may be attributed to different settings and different methods for diagnosis. Present study revealed that with the aging increases diabetes prevalence. Widows were more diabetic than married. Participants belong to class I and II (16.98%) were more diabetic than class IV and V. However significantly higher prevalence of diabetes was mainly found in elderly women belonging to joint family and unemployed that indicates sedentary lifestyle is risk factor for diabetes.

About one third of diabetic were hypertensive and one third fall in pre-hypertensive who were suggested for life style modification. Study done by **R Shankar et al (2013)**⁽²¹⁾ shows significant association between diabetes and hypertension in both sexes. Sample size for this association study is larger than present.

CONCLUSIONS

Half of the elderly women were widow, nearly half living in joint family and later two third in nuclear and rest living alone. Half of them work as laborer to earn livelihood. Almost half of them fall in class IV and V. High prevalence of hyperten-

sion and Diabetes was found among elderly women. Half of total hypertensive and 26 % of total diabetics study participants were not aware of their disease status. Elderly females are most vulnerable for lack of attention from family members due to lower status of female and no representation in property. The deteriorating health problems add to these expenses. Thus health problems and poverty becomes a vicious cycle.

RECOMMENDATIONS

This study recommends that services provided should be based on felt needs of geriatric females.

Moreover, geriatric clinic having specialised professionals with holistic approach and subsidized health care services should be provided at primary level and link to tertiary centres. Appropriate, feasible, affordable, sustainable insurance schemes should be made available to meet their medical expenses. At last, all these services, schemes, policies should be gender sensitive.

Table 1:- Socio-demographic characteristics of elderly women

CHARACTERISTIC	NO. OF ELDERLY WOMEN (N = 260)	PERCENT (%)
1.1 Age (years)wise profile		
60-69	160	61.54
70-79	80	30.77
≥ 80	20	7.69
1.2 Marital Status wise profile		
Married	150	57.7
Unmarried / Widow/ Separated	110	42.30
1.3 Type of family wise profile		
Living alone / Singular	52	20
Nuclear	96	36.93
Three generation / Joint	112	43.07
1.4 Education wise profile		
Illiterate	205	78.85
Literate	55	21.15
1.5 Type of Occupation wise profile		
Unemployed	140	53.85
Employed	120	46.15
1.6 Socio-economic status wise profile		
Class I/II	53	20.39
Class III	94	36.15
Class IV/V	113	43.46

Table 5:- Correlates of Morbidity

Characteristics	Hypertension (79)	² /df/ p value	diabetes (19)	² /df/ p value
Age group(Years)	60-69 (n=160)	41 (25.62)	10 (6.25)	0.68/1/0.407,ns
	70-79 (n=80)	29 (36.25)	7 (8.75)	
	≥80 (n=20)	9 (45)	2 (10)	
Marital Status	Married (n=150)	39 (26)	8 (5.33)	2.04/1/0.153,ns
	Widowed/divorced/separated/Unmarried(n=110)	40 (36.36)	11 (10)	
Literacy status	Illiterate (n=205)	64 (31.21)	14 (6.82)	0.327/1/0.567,ns
	Literate (n=55)	15(27.27)	5 (9.09)	
Type of family	Singular (n=52)	13 (25)	4 (7.69)	5.37/1/0.020,s
	Nuclear (n=96)	28 (29.16)	2 (2.08)	
	Joint (n=112)	38 (33.92)	13 (11.60)	
Socio-Economic status	Class I/II (n=53)	19 (35.84)	9 (16.98)	0.366/1/0.545,ns
	Class III (n=94)	25 (26.59)	3 (3.19)	
	Class IV/V (n=113)	35 (30.97)	7 (6.19)	
Type of occupation	Unemployed (n=140)	53 (37.85)	15 (10.71)	Fisher's exact test/0.0299,s
	Employed (n=120)	26 (21.66)	4 (3.33)	

Table 2 :- Classification of blood pressure

Blood pressure classification	Known Hypertension (O/E) (n=47)	Unknown (O/E) (n=213)	Screening Yield (n=213)	Total Hypertensive (A/E) (n=260)
Normal	10 (21.28)	111 (52.11)	32 (15.02)	79 (30.38)
Pre-hypertension	10 (21.28)	70 (32.86)		
Hypertension stage 1	24 (51.06)	24 (11.27)		
Hypertension stage 2	3 (6.38)	8 (3.76)		
Total	47 (100)	213 (100)		

(Figures in parentheses denote percentages), O/E - On examination, A/E - After examination.

Table 3 :- Range of random blood sugar (n=260)

Random Blood Sugar (mg/dl)	Screened elderly women	Known Diabetic	Total
≤110	79 (32.11)	0	79 (30.38)
111 –140	132 (53.66)	2 (14.29)	134 (51.54)
141 – 170	30 (12.2)	4 (28.57)	34 (13.08)
171 – 200	0	2 (14.29)	2 (0.77)
>200	5 (2.03)	6 (42.85)	11 (4.23)
Total	246 (100)	14(100)	260 (100)

(Figures in parentheses denote percentages)

Table 4 :- Relation between Diabetes (n=19) and Hypertension (n=59)

Diabetes	Hypertension				Total	² /df/ p value
	Normal	Pre-hypertension	Stage 1HT	Stage 2HT		
No	115 (47.72)	73 (30.29)	43 (17.84)	10 (4.15)	241 (100)	0.923/1/0.337
Yes	6 (31.58)	7 (36.85)	5 (26.31)	1 (5.26)	19 (100)	
Total	121 (46.54)	80 (30.77)	48 (18.46)	11 (4.23)	260 (100)	

* ² = Chi-square value, df = degree of freedom

REFERENCES

- 1) Hazzard WR, Bierman EL, Blass JP, Ettinger WH, Halter JB. (1994). Principles of geriatric medicine and gerontology. New York, McGraw-Hills ,3rd ed: p. 1-4.
- 2) Government of India., Situation Analysis of The Elderly in India, (2011), Central Statistics Office, Ministry of Statistics & Programme Implementation, New Delhi, Government of India.
- 3) United Nation, World Population Prospects: The 2002 Revision, Highlights.(2003) New York: United Nations Population Division.
- 4) Sharma S.Ageing.(1994) An Indian experience. Souvenir of ANCIPS 94.:101-5.
- 5) Kulbir Singh, Sanjeev Kumar.(2015). Prevalence of Diabetes Mellitus in Rural Population of Jammu, JK science. Vol. 17 (2) P 84-7.
- 6) Vinod Shah et al, Prevalence of diabetes mellitus and hypertension in the elderly group, in rural community in pune, india. Presented at 12th Global Conference of IFA at Prague May 28th to June 1 st 2012
- 7) World Health Organization. Dept. of Noncommunicable Disease Prevention and Health Promotion (2002).Active ageing A Policy Frame work., Geneva.World Health Organization,
- 8) Department of Health and Human Services, United States. The seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure. Bethesda MD: National Institute of Health and the National Heart, Lung, and Blood Institute; 2004 Aug. p. 1-11.
- 9) World Health Organization,Blood Tests for Diabetes Diagnosis: Two-Hour Postprandial Glucose Test.; Available from::<http://www.dlife.com/diabetes/type-1/diabetes-diagnosis/postprandial> accessed on 20/03/16.
- 10) World Health Organization.(2006) Definition and diagnosis of diabetes mellitus and intermediate hyperglycemia: report of a WHO/IDF consultation. Geneva: World Health Organization; 2006. p. 1-37.
- 11) Government of India (2013).CHAPTER – 2 POPULATION COMPOSITION, Available at www.censusindia.gov.in/9_Chap_2_2013.doc accessed on 23/03/16.
- 12) Lena A, Ashok K, Padma M, Kamath V, Kamath (2009) Health and social problems of the elderly: A cross-sectional study in Udupi taluk, Karnataka. Indian J Community Med;34(2):131-4.
- 13) Shrivastava RK. (2007) Multicentric study to establish epidemiological data on health problems in elderly.. Delhi: Government of India and World Health Organization;. 1st ed p. 46-76.
- 14) Deshmukh PR, Gupta SS, Bharambe MS, Maliye C, Kaur S, Garg BS.(2005)[Online] Prevalence of hypertension, its correlates and levels of awareness in rural Wardha, central India .Available from: URL:<http://www.jhpcd.unc.edu/> accessed on 20/3/16
- 15) Shraddha K,Prashantha B, Prakash B.(2012) Study on morbidity pattern among elderly in urban population of Mysore, Karnataka, India Int J Med Biomed Res .1(3):215-223.
- 16) Rakesh Kumar and Mohammed Shafee; (2014).Assessment of morbidity pattern and its correlates among elderly population in rural area of Perambalur, Tamilnadu, India. IJBR .05 (04): 248-250.
- 17) Prakash R, Choudhary SK, Singh US. (2004) A study of morbidity pattern among geriatric population in an urban area of Udaipur Rajasthan. Indian J Community Med . 29(1):35-40.
- 18) Garg BS, Gupta SC, Mishra VN, Singh RB. (1982).A geriatric study of an urban area. Indian J Public Health;26(2):77-85.
- 19) Gupta SK, Varshney A, Tiwari SC, Shinde M;(2012). The investigation of medical and psychosocial problems of geriatric population in the urban area of Madhya Pradesh in India. Open Journal of Internal Medicine, 2(3): 170-175.
- 20) Garg BS, Gupta SC, Mishra VN, Singh RB.(1982) A geriatric study of an urban area. Indian J Public Health. 26(2):77-85.
- 21) Radhakrishnan S, Balamurugan S. (2013).Prevalence of diabetes and hypertension among geriatric population in a rural community of Tamilnadu. Indian J Med Sci. 67:130-6.