

Original Article Research

ASSOCIATION BETWEEN PHYSICAL ACTIVITY AT WORK, LEISURE TIME AND PREVALENCE OF HYPERTENSION AND AWARENESS REGARDING HYPERTENSION IN THE GERIATRIC POPULATION IN A BLOCK OF DIBRUGARH DISTRICT

Ratna Sarma¹, Pragyant Prakash Gogoi^{2*}

¹Former Professor and HOD, Department of Community Medicine, Assam Medical College and Hospital, Dibrugarh, Assam, India.

²Assistant Professor, Department of Community Medicine, Silchar Medical College and Hospital, Silchar, Assam, India.

Corresponding Author: Dr Pragyant Prakash Gogoi

Assistant Professor, Department of Community Medicine, Silchar Medical College and Hospital, Silchar, Assam, India.

Abstract

Background: Hypertension is a common and powerful predisposing factor for stroke, coronary disease; cardiac failure and peripheral artery disease imposing a 2 -3 fold increased risk of one or more of these atherosclerotic sequelae.

Objective: To see the association between physical activity at work, leisure time and prevalence of hypertension To assess the awareness regarding hypertension in the study population.

Methods: The Community based cross-sectional study was conducted All elderly people aged 60 years and above of both the sexes residing in villages under Lahowal Block of Dibrugarh District in the Department of Community Medicine, Assam Medical College and Hospital, Dibrugarh. The study was carried out over a period of one year from August 2013 to July 2014.

Results: Out of the 370 study participants, 56% were aware of their blood pressure status. Among the hypertensive participants, 60.6% were aware of their blood pressure status 44.3% of the non-hypertensive participants were aware of their blood pressure status. In the present study, amongst the 264 hypertensive participants, 60.6% were aware of their hypertensive status and 55% were currently under treatment of which 20.4% were under control with treatment.

Conclusions: Physical activity at work and leisure time physical activity were observed to be significantly associated with the prevalence of hypertension. Out of the 370 elderly, 56% were aware of their blood pressure status. Among the non-hypertensive elderly, 44.3%

were aware of their blood pressure status. Among the hypertensive elderly, 60.6% were aware of their blood pressure status and 55% were currently on treatment of which 20.4% were under control with treatment

Keywords: Physical activity at work, leisure time, prevalence of hypertension Awareness, geriatric population

INTRODUCTION

Globally, the overall prevalence of raised blood pressure in adults aged 25 and over was around 40% in 2008. The proportion of the world's population with high blood pressure, or uncontrolled hypertension, fell modestly between 1980 and 2008. However, because of population growth and ageing, the number of people with hypertension rose from 600 million in 1980 to nearly 1 billion in 2008.¹

Hypertension is estimated to cause 7.5 million deaths, about 12.8% of the total of all annual deaths, worldwide.² Blood pressure levels have been shown to be positively and progressively related to the risk for stroke and coronary heart disease and this risk of cardiovascular disease doubles for each incremental increase of 20/10 mmHg of blood pressure, starting as low as 115/75 mmHg.³

India is in a stage of epidemiological transition. Affluence, progressive aging of the population, freedom from many dreaded infectious diseases and upward social and economic mobility have presently paved the way for increase in the prevalence of diseases/disorders associated with increasing life expectancies and altered life-styles. The DALY losses due to non-communicable diseases in India, is projected to increase from 29% in 1990 to over 57% in 2020.⁴ Among the NCDs, hypertension is the leading NCD risk and estimated to be attributable for nearly 10 per cent of all deaths in India.⁵

The world population is ageing. Before the start of the demographic transition, life was short, births were many, growth was slow and the population was young. During the phase of transition, mortality declined causing population growth rates first to accelerate and then to slow again, moving towards a long life and old population. The global demographic transition which started in 1800 is projected to be completed by 2100. There will then be 50 times as many elderly, but only five times as many children. The length of life will be tripled while births per woman will drop from six to two.⁶

High blood pressure in the elderly confers a three- to fourfold increase in risk for cardiovascular disease, compared to younger individuals.⁷ NCDs like hypertension are on a rise in India and since the elderly constitute a large part of our population the burden of hypertension in the elderly is going to be tremendous. Multiple mechanisms, including

stiffening of large arteries, endothelial dysfunction, cardiac remodeling, autonomic dysregulation and renal aspects make the elderly more prone to develop hypertension.⁸ The present study was undertaken to study the prevalence and the level of awareness of hypertension among the geriatric population in a block of Dibrugarh district

MATERIALS AND METHODS

The Community based cross-sectional study was conducted All elderly people aged 60 years and above of both the sexes residing in villages under Lahowal Block of Dibrugarh District in the Department of Community Medicine, Assam Medical College and Hospital, Dibrugarh. The study was carried out over a period of one year from August 2013 to July 2014.

Sample Size: Considering the prevalence of hypertension among the elderly in Assam to be 63.63%⁹ and the absolute error to be 5% the sample size was calculated to be 370.

Methodology: The number of study participants to be included from each selected village was decided by proportional allocation. Thereafter house to house visits were carried out in the selected villages and the elderly aged 60 years and above were interviewed after obtaining their informed consent. On reaching the required sample size, the house to house visits were stopped. If required sample size was not obtained in that village, the remaining data were collected from the next nearest village.

Data collection tools and technique: Data was collected by interviewing the study participants using a pre-designed and pre-tested proforma and were clinically examined for blood pressure and anthropometric parameters using standardized technique. Blood samples were collected from 20% of sample size (i.e., 74 study participants) for fasting blood sugar and total serum cholesterol estimation. Fasting blood sugar was estimated using an electronic glucometer while the blood samples for total serum cholesterol estimation were analyzed in autoanalyser in Central Clinical Laboratory, Department of Biochemistry, Assam Medical College and Hospital.

The study participants were interviewed by house-to-house visit. At every household the presence of an elderly person was first ascertained. If an elderly person was present, he or she was included or excluded from the study based on the following criteria:

Inclusion criteria:

- All the elderly aged 60 years and above of both sexes who gave consent to participate in the study

Exclusion criteria:

- Those elderly who were seriously moribund and unable to respond to the interview.

- Those elderly who did not give consent.

After collecting the necessary individual information of the study participants, they were clinically examined for blood pressure and anthropometric parameters such as weight, height, waist circumference and hip circumference. Blood samples were collected from every fifth respondent for fasting blood sugar and total serum cholesterol estimation after obtaining their consent in a consent form.

Study variables

- 1) Demographic variables: Age, sex, religion, educational status, occupation, marital status, number of family members and type of family of the study participants
- 2) Socio-economic status: Modified BG Prasad classification
- 3) Life style or behavioral Risk Factors: physical activity

Statistical analysis: Data was analysed using SPSS 16.0 software. Statistical analysis was done using mean and percentage. Data are presented as tables.

RESULTS

In the present study, out of 370 study participants, 59.5% belonged to the 60-69 years age-group followed by 30% in the age-group of 70-79 years. The least proportion of study participants (10.5%) were in the ≥ 80 year age-group. Most of the study participants were females (62.2%) while the remaining 37.8% were males. Among 230 female participants, majority (61.7%) belonged to the 60 -69 years age-group, 26.5% were in 70-79 years age-group and 11.7% were in the ≥ 80 year age- group. Among 140 male participants, majority (55.7%) belonged to the 60 - 69 years age-group, 35.7% in 70-79 years age-group and 8.6% in the ≥ 80 year age-group. The mean age of the study group was 68.8 ± 7.1 years.

Majority of the study participants (87.8%) were Hindus while the remaining 12.2% were Muslims. In the present study, majority of the study participants (63.8%) belonged to OBC category followed by 17.6% in the general category. The remaining, 18.6% study participants belonged to the SC/ST category.

In the present study, the majority of the study participants (53.5%) were currently married while 36.5% were widows and 10.0% were widowers. Most of the study participants (63.2%) belonged to joint families.

Majority of the study participants (36.5%) belonged to socioeconomic class V followed by 21.9% study participants in class IV. The least number of study participants (6.7%) belonged to socioeconomic class I. Most of the study participants were illiterate (53.2%) followed by 18.4% study participants who were educated up to middle school. 10.5% of the study participants had education up to high school or above.

In the present study majority of the study participants (63.5%) were not gainfully employed followed by 14.3% study participants who had retired and 11.1% who were engaged in agriculture. 5.4% of the study participants were daily wage earners. Most of the study participants (53.2%) were illiterate followed by 18.4% study participants who were educated up to middle school. 10.5% of the study participants had education up to high school level or above. Majority of the study participants (63.5%) were not gainfully employed followed by 14.3% study participants who had retired. 11.1% were engaged in agriculture and 5.4% were daily wage earners.

Out of the 370 study participants, 71.4% were hypertensive while the remaining 28.6% were non-hypertensive. The prevalence of hypertension was highest (89.7%) among the study participants of 80 years and above and lowest (68.5%) in the age group of 70-79 years.

A statistically significant association was observed between age of the study participants and prevalence of hypertension.

Among the male study participants, 68.6% were hypertensive and 31.4% were non-hypertensive.

Among the females, 73.0% were hypertensive while 27.0% were non-hypertensive.

Prevalence of hypertension was 80.0% among the Muslims and 70.2% among the Hindus.

The association between type of family and hypertension was observed to be statistically significant.

The prevalence of hypertension was highest (81.1%) among the study participants who were widowers and lowest (66.7%) in those who were currently married.

However, the association between prevalence of hypertension and marital status was not found to be statistically significant.

Table 1 : Distribution of the study participants according to physical activity at work and blood pressure status

Physical activity at work	Total		Hypertensive		Non-hypertensive		Significance
	No	%	No	%	No	%	
Does not work	45	12.2	43	95.6	2	4.4	p<0.05
Mainly sedentary	45	12.2	26	57.8	19	42.2	
Predominantly walking	190	51.3	136	71.6	54	28.4	
Mainly walking	62	16.7	41	66.1	21	33.9	
Heavy physical worker	28	7.6	18	64.3	10	35.7	
Total	370	100	264	71.4	106	28.6	

Majority of the study participants (51.3%) predominantly walked at one level during work and only 7.6% of the study participants engaged in heavy physical work.

The prevalence of hypertension was highest (95.6%) in those who did not work and lowest (57.8%) in those who were sedentary.

A statistically significant association was observed between physical activity at work and prevalence of hypertension.

Table 2 : Distribution of the study participants according to physical activity during leisure time and blood pressure status

Physical activity during leisure time	Total		Hypertensive		Non-hypertensive		Significance
	No	%	No	%	No	%	
Mainly sedentary	169	45.7	124	73.4	45	26.6	

Mild exercise	172	46.5	125	72.7	47	27.3	p<0.05
Moderate exercise	20	5.4	12	60.0	8	40.0	
Strenuous exercise	9	2.4	3	33.3	6	66.7	
Total	370	100	264	71.4	106	28.6	

Majority of the study participants (46.5%) did mild exercise during leisure time and 45.7% were sedentary. Only 2.4% of the study participants did strenuous exercise.

The prevalence of hypertension was highest (73.4%) in those who were mainly sedentary and lowest (33.3%) in those who did strenuous exercise.

A statistically significant association was observed between physical activity during leisure time and prevalence of hypertension.

The prevalence of hypertension was more in the study participants (84.3%) with a family history of hypertension compared to 67.6% in those who did not have any family history. This difference was observed to be statistically significant.

Awareness regarding hypertension among the study participants:

Table 3: Distribution of the study participants according to awareness about their blood pressure status

Awareness	Total		Hypertensive		Non-hypertensive		Significance
	No	%	No	%	No	%	
Aware	207	56.0	160	60.6	47	44.3	p<0.05
Not aware	163	44.0	104	39.4	59	55.7	
Total	370	100	264	100	106	100	

Majority of the study participants (56.0%) were aware of their blood pressure status. Among the hypertensive participants, 60.6% were aware of their blood pressure status while among the non-hypertensive participants, 44.3% were aware.

The prevalence of hypertension was significantly associated with awareness of the study participants.

Table 4: Distribution of the hypertensive study participants according to awareness of their blood pressure status

Awareness	Males		Females		Total	
	No	%	No	%	No	%
Aware	66	68.7	94	56.0	160	60.6
Not aware	30	31.3	74	44.0	104	39.4
Total	96	100	168	100	264	100

Out of the 264 hypertensive participants, 60.6% were aware of their hypertensive status. Among the males, 68.7% were aware of their hypertensive status while among the females, 56% were aware of their hypertensive status.

Table 5: Distribution of the hypertensive study participants according to their awareness, treatment and control of hypertension

	Males		Females		Total	
	No	%	No	%	No	%
Aware of their hypertensive status	66	68.7	94	56	160	60.6
Aware and currently on treatment for hypertension	29	43.9	59	62.8	88	55.0
Aware and currently on treatment with control of hypertension	5	17.2	13	22.0	18	20.4

Among the males, 68.7% and among the females, 56.0% were aware of their hypertensive status.

In males, among those who were aware of their hypertensive status, 43.9% were currently on treatment of which 17.2% were under control.

In females, among those who were aware of their hypertensive status, 62.8% were currently on treatment of which 22.0% were under control.

DISCUSSION

In the present study, out of the 370 study participants, 71.4% were hypertensive while the remaining 28.6% were non-hypertensive. Radhakrishnan S et al. (2013) in their study in a rural community of Tamil Nadu observed that the prevalence of hypertension in the elderly was 59%.¹⁰ Datta PP et al. (2012) in their study in Eastern India reported that the prevalence of hypertension in the elderly was 53.5%.¹¹

In the present study it was observed that 51.3% of the study participants predominantly walked at one level during work followed by 16.7% of the study participants who mainly walked at work. Only 7.6% of the study participants engaged in heavy physical work. The prevalence of hypertension was 95.6% in those who did not work and 64.3% among those who did heavy physical labor.

A statistically significant association was observed between prevalence of hypertension and work related physical activity. Gupta SK et al. (2012) in their study in Garhwal-Uttarakhand reported that the prevalence of hypertension was 21.1% in sedentary workers and 9.2% in heavy physical workers, which was statistically significant.¹²

Agarwal R et al. (2012) in their study in Agra observed that the prevalence of hypertension was significantly higher (52.55%) among sedentary workers compared to the heavy physical workers (14.54%).¹³

In their study in Gujarat, Parikh S et al. (2011) reported that the prevalence of hypertension was 31.1% among sedentary workers and 3.1% among moderate workers. None of the heavy workers were hypertensive.¹⁴

In the present study, 46.5% of the study participants did mild exercise during leisure time followed by 45.7% of the study participants who were sedentary and 5.4% study participants who did moderate exercise. Only 2.4% of the study participants did strenuous exercise.

A significantly higher prevalence of hypertension was observed in those who were mainly sedentary (73.4%) compared to those who did strenuous exercise (33.3%) during leisure time.

Agarwal R et al. (2012) in their study in an adult population of Agra district reported very significantly ($p < 0.005$) lower prevalence of hypertension (27.17%) in people doing regular exercise as compared to those not doing exercise (40.43%).¹³

The finding of the present study is almost similar to the finding of the study conducted by Agarwal R et al. (2012).

In the present study out of the 370 study participants, 56% were aware of their blood pressure status. Among the hypertensive participants, 60.6% were aware of their blood pressure status while among the non-hypertensive participants only 44.3% were aware of their status. A statistically significant association was observed between prevalence of hypertension and awareness of the study participants regarding their blood pressure status.

In the present study it was observed that out of the 264 hypertensive participants, 60.6% were aware of their hypertensive status. Among the males 68.7% were aware of their hypertensive status while among the females 56% were aware of their hypertensive status. Yuvaraj BY et al. (2010) in their study in rural areas of Davanagere reported that 33.8% of the hypertensive participants were aware of their status. Among both males and females, 16.9% were aware of their hypertensive status.¹⁵

Hazarika NC et al. (2004) in a study in a rural population of Assam observed that 21.6% of the hypertensive participants were aware of their status. Among the males 22.8% were aware while among females 20.7% were aware of their hypertensive status.¹⁶

In the present study the awareness among the hypertensive participants about their blood pressure status was more in comparison to the studies conducted by Yuvaraj BY et al. (2010) and Hazarika NC et al. (2004).

In the present study it was observed that out of the 60.6% hypertensive participants who were aware of their hypertensive status, 55% were currently on treatment and 20.4% had their blood pressure under control after treatment. In males, out of the 68.7% male participants who were aware of their hypertensive status, 43.9% were currently on treatment of which 17.2% were under control with treatment while amongst the females 56% were aware of their hypertensive status and 62.8% were currently on treatment of which 22.0% were under control.

Bharadwaj SD et al. (2012) in their study among adult population (≥ 15 years) in rural Maharashtra observed that only 14.5% of the hypertensive participants were aware of their hypertensive status, out of which 9.4% were on treatment and 3.9% were under control. Among the males, 13.1% were aware of their blood pressure status, out of which 7.5% were on treatment and 2.4% were under control. In females, 16% were aware, 11.4% were on treatment and 5.5% were under control.¹⁷

Mohan V et al. (2007) in their study in South India reported that only 32.8% of the hypertensive participants were aware of their status. Out of these, 70.8% were under treatment and 45.9% had their blood pressure under control.¹⁸

In the present study a much higher proportion of the study participants were aware of their hypertensive status and were currently under treatment and had their blood pressure under control compared to the studies conducted by Bharadwaj SD et al. (2012) and Yuvaraj

BY et al. (2010).

CONCLUSION

Physical activity at work and leisure time physical activity were observed to be significantly associated with the prevalence of hypertension. Out of the 370 elderly, 56% were aware of their blood pressure status. Among the non-hypertensive elderly, 44.3% were aware of their blood pressure status. Among the hypertensive elderly, 60.6% were aware of their blood pressure status and 55% were currently on treatment of which 20.4% were under control with treatment

REFERENCES

1. Danaei G. National, regional, and global trends in systolic blood pressure since 1980: systematic analysis of health examination surveys and epidemiological studies with 786 country-years and 5.4 million participants. *The Lancet*. 2011; 377(9765):568–77.
2. World Health Organization. *Global health risks: mortality and burden of disease attributable to selected major risks*. Geneva: WHO; 2009.
3. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL et al. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. *JAMA*. 2003; 289:2560-72
4. Gupte MD, Ramachandran V, Mutatkar RK. Epidemiological profile of India: Historical and contemporary perspectives. *J. Biosci*. 2001 Nov; 26(4):437S-64S
5. Reddy KS, Shah B, Varghese C, Ramadoss A. Responding to the threat of chronic diseases in India. *The Lancet*. 2005; 366:1744-9.
6. Lee R. The Demographic Transition: Three Centuries of Fundamental Change. *Journal of Economic Perspectives*. 2003; 17(4):167–90.
7. Ooi HHL, Coleman PL, Duggan J, O'Meara YM. Treatment of hypertension in the elderly. *Current Opinion in Nephrology and Hypertension*. 1997; 6(5):504–9.
8. Viridis A, Bruno RM, Neves MF, Bernini G, Taddei S, Ghiadoni L. Hypertension in the elderly: an evidence-based review. *Curr Pharm Des*. 2011; 17(28):3020-31.
9. Hazarika NC, Biswas D, Mahanta J. Hypertension in the Elderly Population of Assam. *JAPI*. 2003 June; 51:567-73.
10. Radhakrishnan S, Balamurugan S. Prevalence of diabetes and hypertension among geriatric population in a rural community of Tamil Nadu. *Indian J Med Sci*. 2013; 67:130-6.

11. Datta PP, Sengupta B, Gangopadhyay N, Firdoush KA, Chanda S, Dutta A et al. Hypertension and Related Morbidity among Geriatric Population of Eastern India. *Mat Soc Med.* 2012; 24(1):29-33.
12. Gupta S, Dixit S, Singh AK, Nagaonkar J, Malik N. Prevalence and predictors of hypertension: A cross-sectional study among people coming to a tertiary health care facility in Garhwal-Uttarakhand. *Indian Journal of Community Health.* 2012 Oct- Dec; 24(4):275-9.
13. Agrawal R, Chaturvedi M, Singh S, Gupta SC. An epidemiological study of dietary and exercise habits as correlates of hypertension in persons aged 45 years and above in Agra district. *Indian Journal of Community Health.* 2012 April-June; 24(2):91-6.
14. Parikh S, Choksi J, Bala DV. The study of epidemiology and determinants of hypertension in Urban Health Training Centre (UHTC). *Gujarat Medical Journal.* 2011 February; 66(1):22-7
15. Yuvaraj BY, Nagendra Gowda MR, Umakantha AG. Prevalence, Awareness, Treatment and Control of Hypertension in Rural Areas of Davanagere. *Indian Journal of Community Medicine.* 2010 Jan; 35(1):138-41.
16. Hazarika NC, Narain K, Biswas D, Kalita HC, Mahanta J. Hypertension in the native rural population of Assam. *The National Medical Journal of India.* 2004; 17(6):300-4.
17. Bhardwaj SD, Sinha U, Shewte MK, Khadse JR, Bhatkule PR. Prevalence, awareness, treatment and control of hypertension among the people above 15 years in rural area Nagpur, Maharashtra - A cross sectional study. *National Journal of Community Medicine.* 2012 April-June; 3(2):213-7.
18. Mohan V, Deepa M, Farooq S, Datta M, Deepa R. Prevalence, awareness and control of hypertension in Chennai--The Chennai Urban Rural Epidemiology Study (CURES-52). *J Assoc Physicians India.* 2007 May; 55:326-32