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Assessment of hypertension in elderly population of Peshawar university

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Abstract---Objective: To assess hypertension in elderly people aged 60 and above residing in university campus Peshawar. Methodology: This cross-sectional study included a total of 103 elderly people aged 60 and above, selected from university campus Peshawar by simple random sampling from January to April 2019. Blood pressure was measured manually. Subjects with systolic blood pressure more than 140 and diastolic blood pressure more than 90 mm of Hg and signs & symptoms of hypertension were considered as hypertensive. Semi-structured questionnaires were used to collect the data. Data was entered and analyzed on SPSS version 20 and Microsoft Excel 2013. Results: The prevalence rate of hypertension in the study population was 68.0% (70/103), which contain 41.8% (43/103) of stage I and 26.2% (27/103) of stage II hypertension. The hypertension was more prevalent in males than females. The combined mean systolic blood pressure of the total population was 146.12 mmHg (SD 21.70 mmHg, 95% CI 141.92-150.31), while mean diastolic blood pressure was 89.61 mmHg (SD 14.15 mmHg, 95% CI 86.88-92.34). Conclusion: Although prevalence of hypertension in geriatric population is very high but major bulk is undiagnosed. A screening and preventive

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program needs to be established on national and international level to prevent further problems due to hypertension.

Keywords---elderly, hypertension, systolic blood pressure, diastolic blood pressure.

Introduction

Aging is defined is progressive deterioration of physiological function with age including a decrease in productivity (1). Aging is a natural and ongoing process. In humans, aging represents the accumulation of changes in a human being over time, encompassing physical, psychological, and social change. Hypertension is long term medical condition in which blood pressure in arteries is persistently elevated. The etiology of systemic hypertension is multifactorial involving multiple blood pressure regulatory systems (2). These regulatory mechanisms are controlled by complex set of genes which express at various stages in human life. Over expression of these genes may be responsible for hypertension which is defined as higher than normal blood pressure for a given age and gender (3). The environmental factors such as obesity, sedentary life styles, diabetes, smoking and excessive salt and excessive alcohol consumption have profound effect on the increasing prevalence of essential hypertension in middle and later decades of life (4). Hypertension is an important risk factor for cardiovascular diseases and has a high mortality rate.

The higher prevalence of hypertension in old age persons is one of the main alarming sign for physicians that hypertension should be treated promptly before development of any symptoms (5). Although people believe that diastolic blood pressure increase is known to be a risk factor, but the importance of role of systolic hypertension should also be kept in mind. Along with hypertension, the pulse rate plays an important role in determining the development of cerebrovascular disease, heart failure or any other cardiac disease especially myocardial infarction due to coronary artery pathology (6) (7). In a controlled randomized research study, it has been shown that control for both the systolic as well as diastolic hypertension is necessary to prevent the occurrence of cardiovascular and cerebrovascular events (8). Prevalence of chronic diseases is expected to increase in coming years. High blood pressure is responsible for 7.5 million deaths and 12.8 % of all deaths worldwide (9). About 1 billion people worldwide are suffering from hypertension and is expected to raise to 1.56 billion by 2025. Similarly in Pakistan 18 % adults and 33 % of adults above the age of 45 years is hypertensive (10). The aim of this article is to assess hypertension among the old age population along with the risk factors that can affect the outcome of hypertension among this age group.

Methodology

A community based descriptive cross-sectional study design was conducted among elderly population aged 60 and above residing in the University campus, Peshawar. The area was selected on a geographical map; and house to house survey was carried out among 100 households of area. First house was selected

by standing beside a mosque and bottle was spun. The house to which the neck of bottle was pointing was the first house to be surveyed. Starting from this house every nearest next house was surveyed. All the elderly people aged 60 and above were included in our study. Informed verbal consent was taken and those who were willing were included in our study. Severely ill, bedridden and unwilling to participate were excluded from our study. Those having blood pressure of less than 120/80mm of hg were considered normal (11). Those having a systolic blood pressure of 121-139 and diastolic of 81-89mm of hg were labeled as pre hypertensive. Those having 140-159 systolic and 90-99mm of hg diastolic were labeled as stage I hypertensive. Those having greater than 160 systolic and 100 mm of hg diastolic were labelled as stage II hypertensive (10). History for sign and symptoms and medication was taken, and those who were having these signs and symptoms and were on medications were considered as hypertensive. Blood pressure was measured by auscultation, using the Riester mercury sphygmomanometer.

Results

The combined mean systolic blood pressure of the total population including both males and females was 146.12 mmHg (SD 21.70 mmHg, 95% CI 141.92-150.31), while mean diastolic blood pressure was 89.61 mmHg (SD 14.15 mmHg, 95% CI 86.88-92.34). The overall mean systolic blood pressure of males was 146.07 mmHg (SD 19.13mmHg, 95% CI 141.06-151.08) while mean diastolic blood pressure is 89.91 mmHg (SD 13.90 mmHg, 95% CI 86.27-93.55). The overall mean systolic blood pressure of females was 146.17 mmHg (SD 24.22 mmHg, 95% CI 139.25-153.09), while mean diastolic blood pressure is 89.26 mmHg (SD 14.29 mmHg, 95% CI 85.17-93.34). The maximum systolic BP among males was 200 mmHg and diastolic BP was 130mmHg, whereas minimum systolic BP was 110 mmHg and diastolic BP was 60 mmHg. The maximum systolic BP among females was 200 mmHg and diastolic BP was 130mmHg, whereas minimum systolic BP was 110 mmHg and diastolic BP was 60 mmHg. Table 1 shows Mean systolic and diastolic BP in male, females and total population in different age groups. The mean systolic and diastolic BP in males is highest in age group of 75-80 years while highest in females is age group of 81 years and above, as shown.

Table 1
Mean Systolic and diastolic blood pressure in different age groups according to sex in age above 60 years

Ages (years)	Male		Female		Total	
	Systolic BP (mmHg)	Diastolic BP (mmHg)	Systolic BP (mmHg)	Diastolic BP (mmHg)	Systolic BP (mmHg)	Diastolic BP (mmHg)
	Mean (SD, 95% CI)	Mean (SD, 95% CI)	Mean (SD, 95% CI)	Mean (SD, 95% CI)	Mean (SD, 95% CI)	Mean (SD, 95% CI)
60-65	138.18 (8.09, 135.3-141.1)	80.91 (6.56, 78.6-83.2)	139.21 (12.93, 134.6-143.8)	86.05 (6.13, 83.8-88.2)	138.83 (15.26, 133.4-144.3)	84.17 (9.32, 78.7-89.6)
66-70	143.81	90.71	143.08	87.69	143.53	89.56

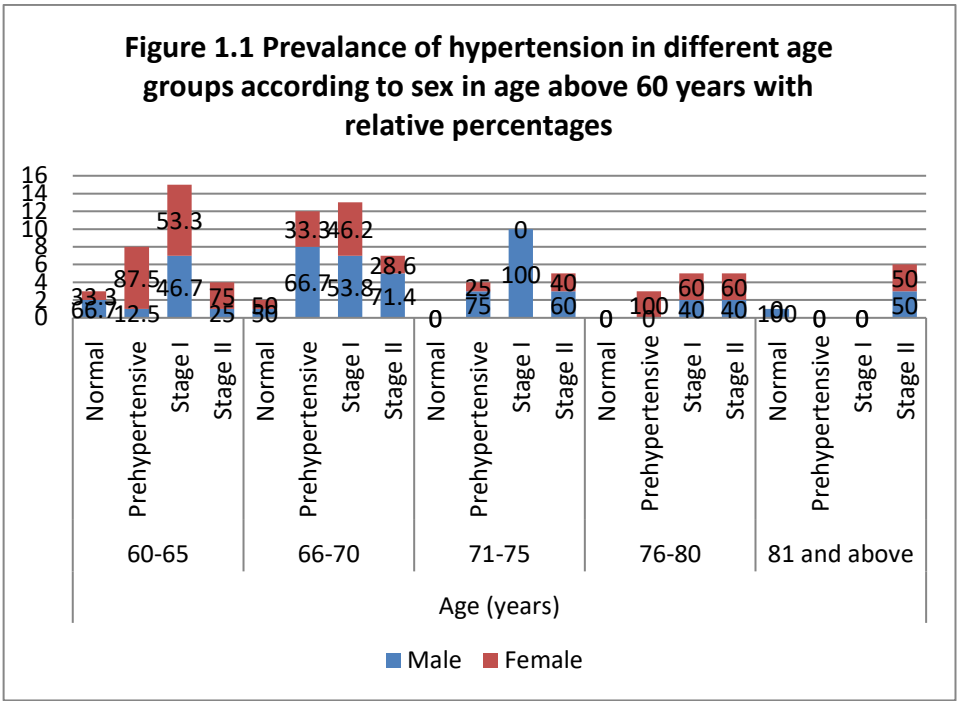
	(14.84, 138.8-148.8)	(10.59, 87.2-90.7)	(14.83, 138.1-148.1)	(8.10, 85.0-90.4)	(5.83, 136.5-150.6)	(13.41, 85.0-94.1)
71-75	150.31 (18.29, 146.1-154.5)	93.13 (12.79, 90.2-96.0)	163.33 (13.48, 157.3-169.4)	96.67 (11.71, 91.4-101.9)	152.37 (23.24, 141.9-162.8)	93.68 (17.39, 85.9-101.5)
76-80	160.00 (9.13, 155.0-165.0)	97.50 (8.54, 92.8-102.1)	150.56 (16.39, 141.6-159.5)	93.33 (15.81, 84.7-101.9)	153.46 (19.30, 142.9-163.9)	94.62 (18.08, 84.9-104.4)
81and above	148.75 (26.58, 122.7-174.8)	90.00 (14.14, 76.1-103.9)	173.33 (46.19, 121.1-225.6)	96.67 (5.77, 90.1-103.2)	159.29 (35.17, 133.2-185.3)	92.86 (11.13, 84.6-101.1)

Of the total population, 5.82% (6/103) had normal blood pressure, 26.21% (27/103) were pre-hypertensives, and 41.75% (43/103) were stage I, while 26.21% (27/103) were stage II hypertensives. Male population was more hypertensive (57.14%, 40/70) than female population (42.86%, 30/70). Of the male population, 7.14% (4/56) had normal blood pressure, 21.43% (12/56) were pre-hypertensives, and 46.43% (26/56) were stage I, while 25.00% (14/56) were stage II hypertensives. Of the female population, 4.26% (2/47) had normal blood pressure, 31.91% (15/47) were pre-hypertensives, and 36.17% (17/47) were stage I, while 27.66% (12/47) were stage II hypertensives. Table 2 shows age-wise distribution; only 5% of the total population had normal blood pressures, 50% of which were in the age group 60-65. The proportion of pre-hypertensive people was greatest in the age group 66-70. Stage I hypertensives were more common in the elderly aged between 71-75 years whereas stage II was seen mostly in the elderly aged above 80 as shown.

Table 2
Different stages of hypertension in different age groups in age above 60 years (as per WHO standards) with %ages in particular age groups.

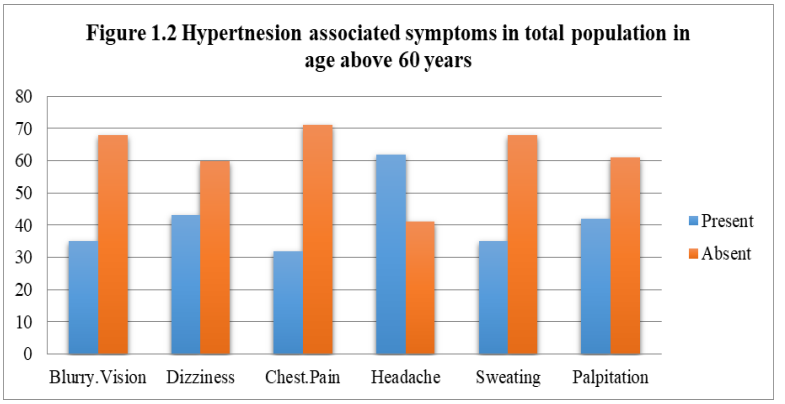
Ages (years)	Normal <120/80	Pre-hypertensive 121-139/ 81-89	Stage I 140-159/ 90-99	Stage II >160/100	Total
	n=6 (%)	n=27(%)	n=43(%)	n=27(%)	n=103(%)
60-65	3 (10.0)	8 (27.0)	15 (50.0)	4 (13.0)	30 (100.0)
66-70	2 (6.0)	12 (35.0)	13 (38.0)	7 (21.0)	34 (100.0)
71-75	0 (0.0)	4 (21.0)	10 (53.0)	5 (26.0)	19(100.0)
76-80	0 (0.0)	3 (23.0)	5 (38.0)	5 (38.0)	13 (100.0)
81 and above	1 (14.3)	0 (0.0)	0 (0.0)	6 (85.7)	7 (100.0)

Figure. 1.1 shows hypertension in gender-wise distribution in different age groups, most of the people with normal blood pressures were in the age group 60-65 with more proportion of males. Pre-hypertensives were common in the age group 66-70 with more males than females. Age groups 60-65 and 66-70 show greater number of stage I and stage II hypertensives respectively as shown.



Of total population, 64.08% (66/103) were using anti-hypertensive drugs, while 35.92% (37/103) were not using any hypertensive drugs. Out of 64.08% (66/103), 21.21% (14/66) had controlled hypertension, while 78.79% (52/66) had high blood pressure. Out of 35.92% (37/103), 43.24% (16/37) had high blood pressures. More of the female population was using anti-hypertensive drugs (33.98%, 35/103) than male population (30.10%, 31/103).

Figure 1.2 shows hypertension associated symptoms were assessed in the subjects, out of whom 33.98% (35/103) had blurry vision, 41.75% (43/103) had dizziness, 31.07% (32/103) had chest pain, 60.19% (62/103) had headache, 33.98% (35/103) had sweating and 40.77% (42/103) had palpitations as shown.



Discussion

About more than two thirds of the elderly were hypertensives, out of which 42% (43/103) were found to have stage I of hypertension while 26% (27/103) of population was having stage II hypertension with a large number of which were in the category of above 80 years age. This is because of weakening of arteries with increasing age. This was less than the study done in rural areas of Peshawar according to which 38.5% of the total studied population was Hypertensive (10). An upward trend was seen in relation to rising blood pressure and age except for the age group 81-85 in which all the subjects were found to have stage II hypertension. Hypertension was more prevalent in males as compared to females. Most of the subjects were found to have one or more symptoms of raised blood pressure; headache being the most common symptom faced by more than half population (12) (13). 2/3rd of the population was using anti-hypertensive medications due to which half of the hypertensive patients had their blood pressure within controlled normal limits.

According to our study, hypertension was found in 68.79% (70/103) of the population. Research conducted in Gujarat, India on Health problems in geriatrics showed that 11.25% of the aged persons had hypertension (14). This lower prevalence of hypertension may be because research was carried out in population of Urban, slum and rural areas, who had diverse lifestyles, socio-economic status and utilization of better health care facilities whereas our research was done in a specific area of Peshawar (15). Moreover, the sample size was also larger as compared to our study. In a research conducted by RP Thakur on elderly population of Pune, it was found that 30.7 % of the population had hypertension (14).

Other studies in 1982 and 1998 conducted in India also showed low prevalence i.e., 16.5% both which was low prevalence as compared to our study (16)(17). It shows that prevalence of hypertension has increased in the elder population in the past few decades. This may be due to the abrupt changes in the life style, change in diet and urbanization of the society. Females were found to have 42.86% (30/70) prevalence of hypertension which is comparable to 2012 study conducted in Tamil Nadu, India in which prevalence was 45.6% (18). In males prevalence was 57% (40/70) which is more than the study conducted in 2012 in Tamil Nadu, India and in Pune, India in 2013 in which prevalence are 44% and 25.6% respectively (19) (20).

Conclusion

Hypertension is the commonest risk factor for cardiovascular and stroke. Although prevalence of hypertension in geriatric population is very high but major bulk is undiagnosed. A screening and preventive program needs to be established on national and international level to prevent further problems due to hypertension.

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