PREVALENCE OF HYPERTENSION IN YOUNGER POPULATION ACCORDING TO NEW ACC GUIDELINES 2017

Aneela Afreen, Muhammad Nadir Khan, Rukhshanda Nousheen*, Syed Khurram Shehzad, Atiq-ur-Rehman, Faraz Saeed Rana

Army Cardiac Centre, Lahore Pakistan, *Allama Iqbal Memorial Teaching Hospital, Sialkot Pakistan

ABSTRACT

Objective: To estimate the prevalence of hypertension in our younger population according to new guidelines released by American College of Cardiology in 2017.

Study Design: Descriptive cross sectional study.

Place and Duration of Study: Army Cardiac Centre Lahore, from Feb 2019 to Apr 2019.

Methodology: One hundred and ninety seven people were enrolled in the study as per inclusive criteria. Two blood pressure measurements were taken 5 minutes apart using proper technique as described in ACC/AHA guidelines and then average blood pressure of the recorded readings was used to calculate the results.

Results: Out of 197 patients enrolled in the study, 103 (52.28%) were females and 94 (47.71%) were males. Age varied from 18 to 60 years with a mean age of 30.87 ± 5.76. Maximum number of individuals i.e. 109 (55.32%) were within 21-30 years. Out of 197, 105 (53.3%) were having normal blood pressure i.e. <120/<80 mmHG, 23 (11.67%) were having elevated systolic blood pressure i.e. 120-129/<80 mmHG, 53 (26.9%) were having blood pressure measurement in range of stage 1 hypertension i.e. systolic blood pressure between 130-139mmHg or diastolic blood pressure between 80-89 mmHG while 16 (8.12%) were having blood pressure in range of stage 2 hypertension i.e. systolic blood pressure >140mmHG or diastolic blood pressure >90 mmHG.

Conclusion: Our findings highlighted the prevalence of silent hypertension in apparently normal individuals and the necessity to overcome this increasing disease burden.

Keywords: Hypertension, Prevalence, Younger population.

INTRODUCTION

Hypertension is one of the commonest and modifiable risk factors for cardiovascular disease and premature mortality worldwide[1]. According to a study done in 2010, global burden of hypertension has exceeded 1.4 billion population[2]. Hypertension is the second leading preventable cause of death due to any reason In U.S. second only to cigarette smoking[3]. Worldwide around 7.5 million deaths per year are attributable to hypertension[4] which is 12.8% of total of all deaths and accounts for 57 million disability adjusted life years (DALYS), 3.7% of the total disability adjusted life years (DALYS). It is said that greater than one third of the world population will be suffering from hypertension by the year 2025[5]. According to WHO data published in 2008, worldwide around 40% of the young adults 25 years of age or greater are having raised blood pressure[4]. Data obtained from National Health and Nutrition Examination Survey (NHANES) 2007-10 revealed that 6% of the U.S adult population was having undiagnosed elevated blood pressure and due to progressively increasing disease burden, cost of hypertension to U.S. health care system is expected to increase 274 billion dollars by the year 2030[6]. For the last few decades there is an increasing trend of highest blood pressure levels in low income countries of south Asia contrary to the initial observation of highest blood pressure in high income countries[7] which is likely to be contributed by unhealthy life style of people of low income countries. According to latest statistic data of WHO updated in May 2018, in Pakistan, every fourth adult above 18 years of age is hypertensive[8] which is a great number and is really challenging for our healthcare system to overcome this progressively increasing burden.

Correspondence: Dr Aneela Afreen, Department of Cardiologist, Army Cardiac Centre, Lahore Pakistan
Email: anilaafreen@gmail.com

Although the prevalence of hypertension varies in different races and ethnicities but increases greatly with age in all races and ethnicities so increasing age itself is a major contributor to greater prevalence of hypertension in elder population. Therefore our study will help out in identifying disease burden in younger population as 64% of Pakistan's population is under 30 years of age and by identifying disease burden in younger population community based measures can be taken to control disease burden at initial stages.

METHODOLOGY

A descriptive cross sectional study was conducted at Army Cardiac Centre Lahore, from February 2019 to April 2019 after approval from institutional ethical committee. One hundred and ninety seven people fulfilling the inclusion criteria were enrolled in the study through a structured questionnaire after getting informed consent. Sample size was calculated at 95% level of significance with 7% margin of error by taking the prevalence of hypertension 46% among U.S. adults[9,10]. All normal healthy young adult males and females ages between 18 to 60 years were included in the study to see the silent hypertension in apparently healthy individuals as people unaware of their hypertensive status are considered high risk for early cardiovascular morbidity and mortality. This included doctors, paramedics, healthcare workers, medical students, internees, researchers and any other non medical person visiting hospital or medical college for purposes other than illness or medical advice. Normal healthy adults greater than 60 years of age were excluded as per AHA description >60 years of age is considered as advanced age[11]. Adults with history of stress, anxiety, smoking, drinking, overweight, sleep disturbance, diabetic or having impaired blood sugars, previously diagnosed as hypertensive or taking any antihypertensive medication or taking any medication for any other ailment or visiting hospital as any patient's attendant and pregnant females were excluded from the study. Blood pressure measurements were taken by using standard auscultatory method after getting the person relaxed and seated quietly in couch for 5 min, supporting the limb on which blood pressure is to be measured and keeping the blood pressure cuff at heart level[12-14]. Appropriate blood pressure cuff size was selected as per arm circumference according to the values described in ACC/AHA guidelines[12-14]. Two measurements of every person were taken at two different occasions and then average of the two blood measurements were calculated using the formula described in Canadian Hypertension Education Program[15]. The average blood pressure measurement was used to calculate the result in terms of percentages of individuals having normal blood pressure, elevated blood pressure, stage 1 hypertension, stage 2 hypertension and gender distribution of these categories of blood pressure. Normal blood pressure was defined as systolic blood pressure <120mmHg and diastolic blood pressure <80 mmHg while Systolic blood pressure between 120-129mmHg and diastolic blood pressure <80mmHg was categorized as Elevated blood pressure. Stage 1 hypertension was defined as systolic blood pressure between 130-139mmHg or diastolic blood pressure between 80-89mmHg and Stage 2 hypertension was defined as systolic blood pressure >140mmHg or diastolic blood pressure >90mmHg. Individuals having systolic and diastolic blood pressure values falling in two different categories were considered in higher blood pressure category[16].

RESULTS

Out of 197 individuals enrolled in the study, 103 (52.28%) were females while 94 (47.71%) were males. Age varied from 18 to 60 years with a mean age of 30.87 ± 5.76. Maximum number of individuals i.e. 109 (55.32%) were in range of ages between 21-30 years while a significant number of individuals i.e. 43 (21.82%) were within age range of 31-40 years. The number of individuals falling within age bracket of 18-20 years were 11 (5.58%). Twenty seven (13.7%) were between 41 to 50 years of age while 07 (3.55%) were lying between 51-60 years. One hundred and five (53.3%) were having blood pressure values within normal range i.e. systolic blood pressure <120 mmHg and diastolic blood pressure <80

mmHg. Among these individuals having normal blood pressure measurements, 36 (18.27%) were males and 69 (35.02%) were females. Ninty two (46.70%) were having blood pressure measurements higher than as classified as normal and among them 58 (29.44%) were men while 34 (17.25%) were women. Twenty three (11.67%) were having elevated blood pressure i.e. systolic blood pressure between 120-129mmHg while having diastolic blood pressure <80mmHg. Among these classified as having elevated blood

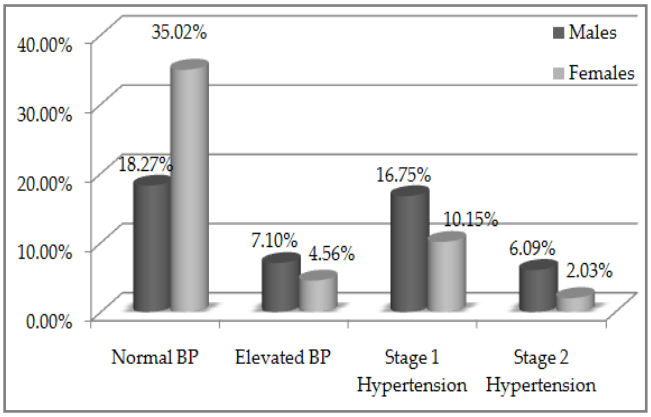

Figure: Gender distribution of different stages of hypertension.

pressure 14 (7.10%) were males while 09 (4.56%) were females. Fifty three (26.90%) were having stage 1 hypertension i.e. having systolic blood pressure between 130-139mmHg or diastolic 80-89mmHg. Among these in category of stage 1 hypertension 33 (16.75%) were males while 20 (10.15%) were females. Twenty five (12.69%) with 18 (9.13%) men and 07 (3.55%) women were having systolic blood pressure in range of stage 1 hypertension with normal diastolic blood pressure i.e. systolic blood pressure between 130-139 mmHg and diastolic blood pressure <80mmHg while 28 (14.21%) with 15 (7.61%) males and 13 (6.59%) females were having diastolic blood pressure in range of stage 1 hypertension with normal systolic blood pressure i.e. systolic blood pressure <120 mmHg and diastolic blood pressure between 80-89mmHg. Sixteen (8.12%) were having blood pressure measurements in range of stage 2 hypertension i.e. systolic blood pressure ≥140mmHg or diastolic blood pressure ≥90mm Hg with frequency of male and female gender 12 (6.09%) & 04 (2.03%) respectively. Among those classified as having stage 2 hypertension, 09 (4.56%) with 06 (3.04%) males and 03 (1.52%) females were having systolic blood pressure in range of stage 2 hypertension i.e. systolic blood pressure ≥140mmHg and diastolic blood pressure <90mmHg while 07 (3.55%) with 06 (3.04%) males and 01 (0.50%) females were having diastolic blood pressure in range of stage 2 hypertension i.e. ≥90mmHg while having systolic blood pressure <140mmHg. Graphical representation of gender wise distribution of different stages of hypertension (figure).

DISCUSSION

Our findings highlighted the prevalence of occult or hidden hypertension in our apparently normal young population. It depicts a major challenge and disease burden in our local population as according to a survey Pakistan is second only to Afghanistan in having highest population of young individuals[17]. Our study population was ranging between 18 to 60 with a mean age of 30.87 ± 5.76 years of age which is in line with the age definition of young population as per AHA description of young age. Maximum number of individuals i.e. 109 (55.32%) were between 21 to 30 years of age which is in accordance with the National Human Development Report (NHDR) report which shows that a vast percentage 64% of the young population of Pakistan falls between 21 to 30 years of age[17]. A substantial proportion of our study population (46.70%) falls in category of having blood pressure values higher than normal by implementation of American College of Cardiology ACC/AHA 2017 guidelines while at the same time, a recently published Canadian study in 2019 shows the prevalence of hypertension in Canadian population according to the same ACC /AHA 2017 guidelines is 42.4% with 32% prevalence in the young age group as of our study population while it is 45.6% in U.S. adult population by implementing the same guidelines[18]. Although these guidelines have lowered the blood pressure limits for diagnosis of hypertension resulting in marked increased is prevalence,

major reduction in Cardiovascular events have been seen by intensifying the systolic blood pressure target of <120mmHg in Systolic Blood Pressure Intervention Trial (SPRINT)[19]. This comparatively lower prevalence of hypertension in high income states of Canada and U.S. than in our Pakistani population is in accordance with the published data by World Health Organization (WHO)[4]. As the study was conducted in Lahore, one of the densely populated urban areas of Pakistan, the burden of disease in this population is in line with the published data showing higher prevalence of hypertension in urban population (26.61%) than in rural population (21.03%) of Pakistan[20]. The frequency of young males having blood pressure higher than normal was greater than females which is in line with the already published meta analysis of different studies conducted on our local Pakistani adolescent and young adult population showing greater percentage of males having blood pressure higher than normal than of the young females[20] and this prevalence steeply increases in both male and female genders of our Pakistani population after third decade of life[21] which is also evident in our study showing higher percentage of elder adults falling in stage 1 and 2 hypertension. Moreover, NHANES 2011-14 study conducted on U.S. adult population showed higher percentage of hypertension in males till 45 years of age, equal percentage between 45 to 64 years and higher percentage of hypertension in elderly females after 64 years of age[22] which is also in line with our finding of higher prevalence of hypertension in young males than of young females while a Turkish study done by Erem *et al* also states higher prevalence of hypertension in females after 40 years of age[23]. A study conducted at different areas of Pakistan in 2018 revealed prevalence of prehypertension (defined as per Joint National Committee JNC 7 guidelines having systolic blood pressure between 120-139mmHg and diastolic 80-89mmHg) 31.4%[24] while in our study percentage of individuals falling in the same blood pressure range (labeled as having elevated systolic and stage 1 hypertension as per American College of Cardiology ACC/AHA 2017 guidelines) is 38.58% which reveals a rapid and progressive increase in disease burden of our local population while this percentage is still little lower than the population of Indian Punjab falling in the same blood pressure range which according to the study of Jaya *et al* is documented as 40.8%[25]. As in our study all the modifiable risk factors for hypertension including smoking, obesity, and diabetes mellitus were excluded as per exclusion criteria, unhealthy life style involving remains the single most important risk factor attributing to development of hypertension in apparently healthy individuals of our local population and this unhealthy life style involves our unhealthy eating habits, sleeping habits, sedentary living, low educational status and emotional stresses.

CONCLUSION

Our findings highlighted the progressively increasing disease burden of hypertension in our young healthy population which is not only a dilemma for our healthcare system but a major financial constraint for our economy.Unhealthy lifestyle is the single most important risk factor contributing to this and is modifiable. Therefore, there is need to conduct population based and community based programs to make people aware of these unhealthy living habits and their significance in development of disease process. Primary prevention programs should be promptly conducted and emphasis should be given on adaptation of healthy lifestyle behaviors.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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