International Journal of Medical and Health Research
ISSN: 2454-9142
Received: 28-08-2019; Accepted: 29-09-2019
www.medicalsciencejournal.com
Volume 5; Issue 10; October 2019; Page No. 171-176

Clinical assessment of principle parameters responsible for the development of hypertension in females

Dr. Arohi Kumar
Professor, Department General Medicine, Narayan Medical College and Hospital, Jamuhar Sasaram, Bihar, India

Abstract
Hypertension is a significant risk factor for CVD both in men and women. Cardiovascular diseases are one of the major causes of deaths in women than any other disease. The important risk factor for CVD is hypertension in women, but unfortunately due to lack of proper data and knowledge it remains underestimated and undiagnosed. Since many years there is amisperception that women are at a lower risk of CVD than men. The incidences of CVD may be markedly reduce if women are treated for high blood pressure, but it has been observed that two thirds of treated hypertensive women have uncontrolled blood pressure. There are some factors that are unique for women responsible for hypertension such as in premenopausal women contraceptives pills, pregnancy and in postmenopausal women with decrease levels of estrogen hormones there is rise of blood pressure, obesity is more common in women, that is an another factor for high blood pressure. Hence based on the various findings and reported literature the present study was planned Clinical Assessment of Principle Parameters Responsible for the Development of Hypertension in Females.
The present study was planned in Narayan Medical College and Hospital, Jamuhar Sasaram, Bihar, India. The 672 female patients referred to Department of General Medicine were evaluated in the present study. Out of that 100 females were found positive cases of hypertension.
Hypertension has become one of the major health issues for both men and women; but there is an increasing incidence of hypertension in women. Women are at high risk to die from hypertension related cardiovascular diseases, yet less attention are paid to hypertension related problems in women. From the above findings, it can be inferred that there is a gap in hypertension awareness, treatment, and control in the study population inviting urgent public health intervention particularly targeting the population at risk, including younger population.

Keywords: Hypertension, Factors, Blood pressure, etc

1. Introduction
According to WHO “health is a state of complete physical, mental & social well-being & not merely absence of disease and infirmity”. Some would consider it idealistic and non-realistic, as this definition categories majority of people as unhealthy. and more over Economic development in wealthy countries and in developing countries was accompanied by the emergence of non-communicable diseases as the predominant health problem. As a result, non-communicable diseases are often referred to as ‘diseases of affluence’- a misleading term. A more accurate label is ‘diseases of urbanization [1].
Due to globalization and urbanization trends of diseases are growing rapidly and more number of individuals are exposed to various diseases. Individuals in the developing world have the 'double whammy' of increased chronic disease prevalence combined with persistently high rates of infectious diseases, leading to exceedingly high overall morbidity and mortality. Social and economic changes have a profound effect on the development of cardiovascular disease due to lifestyle factors. In the developing world, an increase in westernized diets and physical inactivity in concert with a tendency towards increasing life expectancy have led to increased blood pressures, high blood sugars, and elevated lipid levels [2].
Chronic non communicable diseases contributed to 35 of the 58 million deaths (60.3%) in the world in 2005. 80 per cent of these deaths occurred in low and middle income countries. Based on available trends, by 2020 non communicable diseases are predicted to account for 73% of deaths and 60% of disease burden. In India, non-communicable diseases were responsible for 53 per cent of deaths and 44 per cent of disability adjusted life years lost [3].
Hypertension is the commonest cardiovascular disorder, posing a major public health challenge to population in socioeconomic and epidemiological transition. It is one of the major risk factor for cardiovascular mortality, which accounts for 20-50% of all deaths. Developed countries are considering it as a leading cause of death but even developing countries do not lag behind in being affected by it [3].
Community surveys have documented that between three and six decades, prevalence of hypertension has increased by about 30 times among about developers by about 10 times among rural inhabitants, various factors might have contributed to their rising trend and among others, consequences of urbanization such as change in life style pattern, diet and stress increased population and shrinking employment have been implicated [3].
Hypertension is now recognized as a very major contributor to disease burden globally. The World Health Report 2002 identified hypertension, or high blood pressure, as the third ranked factor for disability-adjusted life years. Hypertension is one of the primary risk factors for heart disease and stroke, the leading causes of death worldwide. Recent analyses have shown that as of the year 2000, there were 972 million people living with hypertension worldwide, and

it is estimated that this number will escalate to more than 1.56 billion by the year 2025. Nearly two-thirds of hypertensive lives in low- and middle-income countries, resulting in a huge economic burden [4].

Cardiovascular disease have emerged as an important health problem in India, and caused 2.3 million deaths in India in the year 1990; this is projected to double by the year 2020. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India. High blood pressure is a major risk factor and better control can lead to prevention of 300,000 of the 1.5 million annual deaths from cardiovascular disease in India. The prevalence of Hypertension is 10% amongst the adult population in urban areas and 5% in the rural areas [5].

Hypertension is the commonest cardiovascular disorder affecting at least 20% of adult population in several countries. It is one of the important risk factors for cardio-vascular mortality accounting for 20-30% of all deaths. Blood pressure increases with age. About 2 /3 of people age more than 65 have hypertension, and people with a normal blood pressure at age 55 have a 90% lifetime risk of developing hypertension. Because hypertension becomes so common with age, the age-related increase in Blood pressure may seem innocuous, but higher blood pressure increases morbidity and mortality risk [6].

High blood pressure develops in all social and economic groups, and affects both men and women. It generally begins in adulthood between the ages of 35 and 50, although it also occurs to a lesser extent among children and younger adults. A Study Stated that, the age-standardized prevalence of hypertension (screening blood pressure ≥160/95 mm Hg or taking antihypertensive medication) was 36% in men and 25% in women aged 25 to 64 years [7].

Essential hypertension is the most prevalent hypertension type, affecting 90–95% of hypertensive patients. Although no direct cause has been identified, there are many factors such as sedentary life style, smoking, stress, visceral obesity, potassium deficiency hypokalemia, obesity (more than 85% of cases occur in those with a body mass index greater than 25), salt (sodium), sensitivity alcohol intake, and vitamin deficiency that increase the risk of developing hypertension. Risk also increases with aging, some inherited genetic mutation and having a family history of hypertension [8]. Hypertension is the most important risk factor for death in industrialized countries. It increases atherosclerosis thus predisposes individuals to heart disease, peripheral vascular disease, and strokes. Types of heart disease that may occur include: myocardial infarction, heart failure, and left ventricular hypertrophy. Other complications include: hypertensive retinopathy hypertensive nephropathy.

Lifestyle measures for lowering blood pressure include reduced alcohol intake, reduced sodium chloride intake, increased physical activity, and control of overweight. Lifestyle interventions also have the potential to reduce the need and the amount of medications in hypertensive's and prevents high blood pressure from developing in non-hypertensive. Furthermore, lifestyle interventions are instrumental in controlling other concomitant cardiovascular risk factors not necessarily related to hypertension, such as smoking, raised cholesterol level, or diabetes, hence the importance of a multifactorial approach to effective risk reduction in hypertensive's [7].

In most people with established essential hypertension, increased resistance to blood flow (total peripheral resistance) accounts for the high pressure while cardiac output remains normal. There is evidence that some younger people with prehypertension or 'borderline hypertension' have high cardiac output, an elevated heart rate and normal peripheral resistance, termed hyperkinetic borderline hypertension. These individuals develop the typical features of established essential hypertension in later life as their cardiac output falls and peripheral resistance rises with age. Whether this pattern is typical of all people who ultimately develop hypertension is disputed. The increased peripheral resistance in established hypertension is mainly attributable to structural narrowing of small arteries and arterioles, although a reduction in the number or density of capillaries may also contribute [9].

It is not clear whether or not vasoconstriction of arteriolar blood vessels plays a role in hypertension [10]. Hypertension is also associated with decreased peripheral venous compliance [11] which may increase venous return, increase cardiac preload and, ultimately, cause diastolic dysfunction.

Pulse pressure (the difference between systolic and diastolic blood pressure) is frequently increased in older people with hypertension. This can mean that systolic pressure is abnormally high, but diastolic pressure may be normal or low, a condition termed isolated systolic hypertension [12]. The high pulse pressure in elderly people with hypertension or isolated systolic hypertension is explained by increased arterial stiffness, which typically accompanies aging and may be exacerbated by high blood pressure [13].

Many mechanisms have been proposed to account for the rise in peripheral resistance in hypertension. Most evidence implicates either disturbances in the kidneys' salt and water handling (particularly abnormalities in the intrarenal renin–angiotensin system) or abnormalities of the sympathetic nervous system. These mechanisms are not mutually exclusive and it is likely that both contribute to some extent in most cases of essential hypertension. It has also been suggested that endothelial dysfunction and vascular inflammation may also contribute to increased peripheral resistance and vascular damage in hypertension. Interleukin 17 has garnered interest for its role in increasing the production of several other immune system chemical signals thought to be involved in hypertension such as tumor necrosis factor alpha, interleukin 1, interleukin 6, and interleukin 8 [14].

Consumption of excessive sodium and/or insufficient potassium leads to excessive intracellular sodium, which contracts vascular smooth muscle, restricting blood flow and so increases blood pressure.

The World Health Organization has identified hypertension, or high blood pressure, as the leading cause of cardiovascular mortality. The World Hypertension League (WHL), an umbrella organization of 85 national hypertension societies and leagues, recognized that more than 50% of the hypertensive population worldwide are unaware of their condition. To address this problem, the WHL initiated a global awareness campaign on hypertension in 2005 and dedicated May 17 of each year as World Hypertension Day (WHD). Over the past three years, more national societies have been engaging in WHD and have been innovative in their activities to get the message to the public. In 2007, there was record participation from 47 member countries of the WHL. During the week of WHD, all these countries – in partnership with their local

governments, professional societies, nongovernmental organizations and private industries – promoted hypertension awareness among the public through several media and public rallies. Using mass media such as Internet and television, the message reached more than 250 million people. As the momentum picks up year after year, the WHL is confident that almost all the estimated 1.5 billion people affected by elevated blood pressure can be reached [15].

Hypertension is a significant risk factor for CVD both in men and women. Cardiovascular diseases are one of the major causes of deaths in women than any other disease. The important risk factor for CVD is hypertension in women, but unfortunately due to lack of proper data and knowledge it remains underestimated and undiagnosed. Since many years there is amisperception that women are at a lower risk of CVD than men. The incidences of CVD may be markedly reduce if women are treated for high blood pressure, but it has been observed that two thirds of treated hypertensive women have uncontrolled blood pressure. There are some factors that are unique for women responsible for hypertension such as in premenopausal women contraceptives pills, pregnancy and in postmenopausal women with decrease levels of estrogen hormones there is rise of blood pressure, obesity is more common in women, that is an another factor for high blood pressure [16]. Hence based on the various findings and reported literature the present study was planned Clinical Assessment of Principle Parameters Responsible for the Development of Hypertension in Females.

Methodology

The present study was planned in Narayan Medical College and Hospital, Jamuhar Sasaram, Bihar, India. The 672 female patients referred to Department of General Medicine were evaluated in the present study. Out of that 100 females were found positive cases of hypertension.

All the patients were informed consents. The aim and the objective of the present study were conveyed to them. Approval of the institutional ethical committee was taken prior to conduct of this study.

Following was the inclusion and exclusion criteria for the present study.

Inclusive Criteria: Patient who has blood pressure of 140/90 mm of Hg or more; patient not receiving home care management of hypertension; are present during the period of data collection; can understand and speak in Kannada and English; are willing to participate; both male and female sex.

Exclusion Criteria: Patients who are seriously ill; bed ridden patient; hospitalised; unconscious patient; who cannot follow instructions.

Table 1

Normal	Systolic: less than 120 mmHg
	Diastolic: less than 80 mmHg
At risk (prehypertension)	Systolic: 120–139 mmHg
	Diastolic: 80–89 mmHg
High	Systolic: 140 mmHg or higher
	Diastolic: 90 mmHg or higher

Results & Discussion

Until recently hypertension was considered to be one of the important public health problems in the developed and industrialized countries only. In the developing countries, its impact was not fully felt due to presence of rampant communicable diseases. However with control of communicable disease and increased life expectancy with life style changes, hypertension is becoming one of the emerging problems with its implications for concomitant increase in risk of cardiovascular and renal disease.

Different studies carried out by Indian workers revealed varying prevalence rate of hypertension among adult population depending upon the criteria taken for classification, age group and type of population studied. The prevalence rate of hypertension reported in the present study 25.2% was the highest as compared to other studies in rural populations of India. The criteria taken for labeling hypertension (that is > 140 / 90 mm of Hg.), the increasing global trend in high prevalence of hypertension including rural areas due to changing life styles, stress and strain of life. The awareness of the problem and the co-operation of rural population for subjecting themselves readily for medical examination might be some of the factors for finding the high prevalence of hypertension in the present study. According to WHO scientific group 10-20 percent of adults in the world have hypertension based on the criteria suggested by their expert committee [17]. In the developing countries [3] the prevalence rate of hypertension varied from 15 to 33 percent [18]. Thus the prevalence rate of hypertension differs from population to population depending upon the cut off point used.

The occupational status has been found to have association with hypertension in the present study. Those who were in professional group had lesser prevalence rate as compared to other category of occupation. On the contrary Padmavathi and Guptha [19] at Delhi, Gosh & Joshi *et al*. [20] at Simla found that hypertension was more common in professional group as compared to unskilled and semiskilled groups, but Mill *et al*. [21] did not find any significant association between occupational status and hypertension. Probably, the level of occupation may materially affect physical activity and other aspect of life in relation to hypertension.

Table 1: Age Groups & No. of Females

Factors	No. of Females	Percentage of Cases
Total Cases Analyzed	672	100
Cased of Hypertension	100	14.88
Age		
20 – 30 years	1	1
31 – 40 years	22	22
41 – 50 years	45	45
51 – 60 years	12	12
60 years & above	20	20

Table 2: Risk Factors

Factors	No. of Cases	Percentage of Cases
Marital status		
Unmarried	4	4
Married	94	94
Widow/widower	2	2
Total	100	100
Occupation		
Unemployed	31	31
Unskilled work	14	14
Semiskilled/skilled	2	2
Clerical/professional	53	53
Total	100	100
Body mass index		
<18.0	3	3
18.0–22.9	5	5
23.0–24.9	15	15
≥ 25	77	77
Total	100	100
Waist circumference		
Normal	11	11
Abnormal ≥80 cm	89	89
Total	100	100
Waist hip ratio		
Normal	25	25
Abnormal	75	75
Total	100	100
Exercise		
None	56	56
Irregular	22	22
Regular	22	22
Total	100	100
Daily salt intake		
Below average/average	15	15
Above average	85	85
Total	100	100
Hypertension: Family history		
Neither parent positive	41	41
One parent positive	20	20
Both parents positive	11	11
Participant did not know	28	28
Total	100	100

The study showed that obesity measured by BMI is a modifiable risk factor to develop hypertension. There was positive relation observed between increasing BMI and increase rate of hypertension, which was consistent with other studies [22-27]. One of the probable reasons behind this positive relation between obesity and hypertension could be that increased weight increases cardiac output and increases peripheral resistance of arterioles. Hypertension is a readily treatable risk factor for most common causes of morbidity and mortality in stroke, ischaemic heart disease, renal insufficiency and dementia. It has been suggested that the burden of stroke and ischaemic heart disease may be several times higher in hypertensive subjects in our study. In this study it has been found that hypertension increases the risk of cardiovascular diseases in elderly population.

Hypertension increases the risk of cardiovascular disease (CVD) by two-folds including coronary heart disease (CHD), ischemic and haemorrhagic stroke, congestive heart failure, peripheral arterial disease and renal failure. Although the incidence of CVD has been declined in the recent decades but cardiovascular diseases still continues to be a leading cause of morbidity/mortality among the developed countries. Necroscopy studies establishes the fact that the underlying pathogenesis of CVD has its roots in

childhood. The classic risk factors (obesity, family history, diabetes mellitus, smoking and hypercholesterolemia) carries the potential to predict early diagnosis of CVD in only 50% of the cases, so much effort is required for the identification of other possible risk factors.

Some other studies showed that prevalence of hypertension is more in stressed individual than unstressed individual. Stress may activate the sympathetic nervous system directly. This sympathetic nervous system under the control of central nervous system causes over-activity with high sodium intake, the rennin angiotensin system and insulin resistance leading to higher blood pressure. It has also been observed that the descendants of hypertensive parents also respond in a similar way even though the component of hypertension has yet not been precipitated. Hyperactivity of SNS to stress may contribute to pre hypertension and other CVD due to release of epinephrine and norepinephrine and catecholamine increases force and rate of contraction of heart vascular changes.

This article indicates the need for further investigation of hypertension prevalence, treatment, and control among women in Asian countries. Future research that identifies barriers that contribute to adopting healthy lifestyles among hypertensive women in India required. Such research is essential to developing effective awareness programs that would help women in those countries to overcome these barriers and adopting healthy lifestyles to control the epidemic of hypertension.

There is an urgent need for public health and clinical interventions to prevent onset of hypertension and better hypertension control including long term management using standard public health approaches.54 These interventions include policy -level, health system -level, population -level and clinic based individual -level interventions. Policy and system level interventions should be focused on public education and screening, while population level interventions should focus on reduced intake of salt and alcohol, smoking cessation, promotion of healthy diet and facilitation of physical activity. Individual level interventions should be on better physician education who should promote individual lifestyle changes, appropriate pharmacotherapy and control of vascular risk factors along with efforts to improve adherence.

Conclusion

Hypertension has become one of the major health issues for both men and women; but there is an increasing incidence of hypertension in women. Women are at high risk to die from hypertension related cardiovascular diseases, yet less attention are paid to hypertension related problems in women. From the above findings, it can be inferred that there is a gap in hypertension awareness, treatment, and control in the study population inviting urgent public health intervention particularly targeting the population at risk, including younger population.

References

1. Panwar AB, Bansal RK, Bhadoriya Presh, Panchal Shaishav, Patel HB, Padariya PK, Patel GH. Prevelence of hypertension among elderly women in slums of surat city" Original article. Available from: URL: http://www.njcmindia.org/uploads/01-01 39-40.pdf
2. Sujatha Sankaran, Rahul Shetty. Cardiovascular disease in the developing world" Medpedia, Available from : URL:http://wiki.medpedia.com/cardiovascular_disease_in_the_developing_world
3. Shyamal Kumar Das, Kalyan Sanyal, Arindam Basu. Study of urban community survey in India: Growing trend of high prevalence of hypertension in a developing country" international journal of medical sciences. 2005; 2:70-78. Available from: URL: http://www.medsci.org/v0p0070.htm
4. George Manesh M, Bombardier C, *et al*. Clinical Approach to Hypertension. Harvard publication. 2004, 1520-1528.
5. Gaziano T, Reddy KS, Paccand F, Horton S, Chaturved V. Cardiovascular Disease in Disease Control Priorities in Developing World, Oxford University Press, Oxford, 2006, 645-662.
6. Bakris George L. The seventh report of the joint national committee on prevention, detection, evaluation and treatment of high blood pressure 2007. Available from: URL: http://www.merk.com
7. Line Aubert, Pascal Bovert, *et al*. knowledge, attitude and ractice on hypertension in country in epidemiological transition, American Heart Association journal. 1998; 31:1136-1145. Available from URL: http://www,hyper.ahajournal.orgconten/31/5/1136.full
8. Carretero OA, Oparil S. Circulation. 2000; 101(3):329–35. Available from: URL: http://circ.ahajournals.org/cgi/pmidlookup?view=long&pmid=10645931.
9. Struijker Boudier HA, le Noble JL, Messing MW, Huijberts MS, le Noble FA. The microcirculation and hypertension. Journal of Hypertension Supplement. 1992; 10 (7):S147-56. doi:10.1097/00004872-199212000-00016. PMID 1291649.
10. Schiffrin EL. Reactivity of small blood vessels in hypertension: relation with structural changes. State of the art lecture". Hypertension. 1992; 19 (2Suppl):II1–9. doi:10.1161/01.HYP.19.2_Suppl.II1-a. PMID 1735561.
11. Safar ME, London GM. Arterial and venous compliance in sustained essential hypertension". Hypertension. 1987; 10(2):133-9. doi:10.1161/01.HYP.10.2.133. PMID 3301662.
12. Chobanian AV. Clinical practice. Isolated systolic hypertension in the elderly". The New England Journal of Medicine. 2007; 357(8):789-96. doi:10.1056/NEJMcp071137. PMID 17715411.
13. Zieman SJ, Melenovsky V, Kass DA. Mechanisms, pathophysiology, and therapy of arterial stiffness". Arteriosclerosis, Thrombosis, and Vascular Biology. 2005; 25(5):932-43. doi:10.1161/01.ATV.0000160548.78317.29. PMID 15731494.
14. Gooch JL, Sharma AC. Targeting the immune system to treat hypertension: where are we?". Current Opinion in Nephrology and Hypertension. 2014; 23(5):473-9. doi:10.1097/MNH.0000000000000052. PMID 25036747.
15. Chockalingam A. World Hypertension Day and global awareness". The Canadian Journal of Cardiology. 2008; 24(6):441-4. doi:10.1016/S0828-282X(08)70617-2. PMC 2643187. PMID 18548140.
16. Hypertension in women: latest findings and clinical implications -NC ttps www n i nl ni ov NC Literature Pu Me Central PMC y Gu un s ottir --Cite y -Related articles
17. Park K. Text book of Preventive and Social medicine 17th edition. P279-232.

18. Burch GE, De Pasquale NP. Primer of clinical measurement of blood pressure; CV mc Soy company st lours(ed), 1962, 15-35.
19. Padmavathi S. Gupta S.-blood pressure study in rural and urban groups in Delhi; Circulation. 1959; 19:395-405
20. Ghosh BN, Bansal RD, Bhardwaj UD, Joshi S. CA blood pressure survey in Simla Hills. Journal Indian Med Association. 1983; 80:47-52.
21. Miall WE, Kass EH, Ling J, Saurt KL. Factors influencing arterial pressure in general population in Jamaica. Brtish Medical Journal. 1962; 2:499-506.
22. Erem C, Hacihasanoglu A, Kocak M, Deger O, Topbas M. Prevalence of prehypertension and hypertension and associated risk factors among Turkish adults: trabzon hypertension study. Journal of Public Health. 2009; 31:47-58.
23. Ahmed A, Rahman M, Hasan R, *et al*. Hypertension and associated risk factors in some selected rural areas of Bangladesh. International Journal of Research in Medical Sciences. 2014; 2:925.
24. Mishra CP, Kumar S. Risk factors of hypertension in a rural area of Varanasi. Indian Journal of Preventive and Social Medicine. 2011; 42:101-111.
25. Singh R, Sinha RK, Mani C, Singh R, Pal R. Burden and vulnerability of hypertension in a rural population of Patna, Bihar, India. South East Asia Journal of Public Health. 2013; 1:1.
26. Dhungana RR, Pandey AR, Bista B, Joshi S, Devkota S. Prevalence and associated factors of hypertension: a community-based cross-sectional study in municipalities of Kathmandu, Nepal. International Journal of Hypertension. 2016.
27. Costa. Hypertension prevalence and its associated risk factors in adults: a population-based study in Pelotas. Arq Bras Cardiol. 2007; 88:54-59.