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HIGH RATES OF HYPERTENSION IN INDIA

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ABSTRACT

Hypertension is known as 'silent killer' is widely prevalent in India. It is one of the most significant public health problem and a common lifestyle disease. Now a day this is cause for 57% of stroke and 24% of coronary heart disease deaths in India. Hypertension is essential for targeting of prevention, screening and treatment services. High prevalence of hypertension has been reported from various regions of the country. Many areas of India still face substantial burdens of infectious diseases and poor maternal and child health.Recent studies have reported that shown that hypertension is present in 25- 30% urban and 10-20% rural subjects in India. This translates into an approximate population burden of 100-110 million persons with high blood pressure (BP). Approximately half to two -thirds of these are stage Ihypertension (systolic BP 140-159 and/or diastolic BP 90- 99 mm Hg) and the rest have stage II -III disease. Atherosclerosis i.e. hardening of arteries and increases heart disease and stroke it is a condition of congestive heart failure, kidney disease and blindness. Chronic Non-Communicable diseases are important among adult population all over the world this treatment of hypertension using different types of synthetic antihypertensive drugs shows many side effects but about 75% to 80% of world population were using herbal medicine and more research needs to be verify the effectiveness and elucidate the safety profile of herbal medicine for anti-hypertension potential**.**There is low awareness, treatment and control status of Hypertension in India, more among the rural than in urban populations.Precautions are there in hypertension of various level lifestyle modification, dietary factors, weight loss and exercise treatment and control status of hypertension in India, more among the rural than in urban populations.Hypertension management is everybody's responsibility has aactive management of blood pressure and preventive strategiesdecreasing mortality and morbidity due to hypertension.

KEYWORDS: Hypertension, Atherosclerosis, Rural Population & Urban Population, lifestyle and diet.

INTRODUCTION

Fig1: Blood Pressure Measurement.

The hypertension has changed over time in response to better understanding of the Pathophysiology, actuarial considerations of the life insurance industry, studies of blood pressure in diverse populations, consideration of the interaction of blood pressure levels and co morbid conditions, landmark studies of blood pressure–related health outcomes, and the development and evaluation of effective antihypertensive therapies. Definitions for the upper level of normal ranges of blood pressure for adults have been based on epidemiological findings relating blood pressure levels to risks for adverse outcomes in populations and evidence from clinical trials demonstrating reduced risk of adverse outcomes with antihypertensive therapies' hypertension isprevalent across all geographic and sociodemographic groups. Low hypertension treatment and control are rural locations, low socioeconomic and educational status and female gender. Cardiovascular risk factors such as smoking, high blood pressure (BP), high low density lipoprotein (LDL) cholesterol, low high density lipoprotein (HDL) cholesterol, metabolic syndrome and diabetes are the major risk factors associated with the increasing CVD in India Population.[1]

Hypertension is higher among adults under 45 than previously estimated to have the highest rates for young adults. "These so-called lifestyle diseases are becoming more and more problematic, not only in the Western world, but also in India. Unfortunately, the health care

systems are not yet prepared to face the new situation." Increased awareness and treatment and control of high BP are critical for reduction of mortality and morbidity expensive tertiary care of non communicable disease to primary and secondary prevention provided by primary health care community the cost also effective and save lives. Health system related individual factors are determinates and barriers for the poor quality of hypertension management.

RECENT STUDIES ON HYPERTENSION PREVALENCE IN INDIA

Both urban and rural areas in India have been surveyed to estimate the prevalence of hypertension and a number of reviews have highlighted escalating burden of hypertension in India.8,9,10,11 In the mid -1950s, Indian urban population based epidemiological studies used older World Health Organization (WHO) criteria for diagnosis (known hypertension or BP >160 mm Hg systolic and/or 95 mm Hg diastolic) and reported hypertension prevalence of 1.2 to 4.0%.8 Since then prevalence of hypertension in Indian cities has been steadily increasing from 3.0-4.5% in early 1960's to 11.0 to 15.5% in mid-1990's.8 Although rural populations in India generally have lower prevalence of hypertension there has been a significant increase in these populations from less than 1% in early 1960's to 5-7% in late 1990's.8[2]

Table 1: Recent Hypertension Prevalence Studies in Urban Populations.

First Author	Ref.	Year reported	Place	Age Group (years)	Sample Size (No)	Prevalence Reported (%)
Gupta R	12	1995	Jaipur	>20	2212	30.9
Anand MP	13	2000	Mumbai	30-60	1662	34.0
Gupta R	14	2002	Jaipur	>20	1123	33.4
Shanthirani CS	15	2003	Chennai	>20	1262	21.1
Gupta PS	16	2004	Mumbai	>35	88653	47.9
Prabhakaran D	17	2003	Delhi	20-59	2953	30.0
Reddy KS	18	2006	National	20-69	19973	27.2
Mohan V	19	2006	Chennai	>20	2350	20.0
Kaur P	20	2007	Chennai	18-69	2262	27.2
Yadav S	21	2008	Lucknow	>30	1746	32.2
Gupta R	22	2012	National	>35	2616	48.2
Prince MJ	23	2012	Chennai	>60	1000	60.0
Gupta R	24	2012	Jaipur	>20	739	32.1
Joshi SR	25	2012	National	49(mean)	15662	46.0
Gupta R	26	2013	National	>20	6106	31.5
Bhagyalaxmi R	27	2013	Gujarat	15-64	1805	29.0
Bhansali R	28	2014	National	>20	14059	26.3

Table 2: Hypertension Prevalence Studies in Rural Populations.

First Author	Ref.	Yearreported	Place	AgeGroup (years)	Sample Size (No)	Prevalence Reported (%)
Gupta R	29	1994	Rajasthan	>20	3148	16.9
Kusuma	30	2004	Andhra	>20	3180	21.0
Hazarika NC	31	2004	Assam	>30	1316	33.3
Todkar	32	2008	Haryana	15-64	2828	9.3
Krishnan ss	33	2009	Maharashtra	>20	1297	7.2
Bhardwaj R	34	2010	Himachal	>18	1092	35.9
By Y	35	2010	Karnataka	>18	1900	18.3
Kinra s	36	2010	National	20-69	1983	20.0
Gupta R	22	2012	National	>35	4624	31.5
Prince MJ	23	2012	Tamilnadu	>65	1000	29.0
Kaur P	37	2012	Tamilnadu	25-64	10463	21.4
Kokiwar PR	38	2012	Tamilnadu	>30	924	19.0
Dutta A	39	2012	West Bengal	>18	1186	24.7
Borah PK	40	2012	Assam	>30	916	55.6
Haddad S	41	2012	Kerala	18-96	1660	23.5
Bansal SK	42	2012	Uttarakhand	>18	968	28.9
Meshram II	43	2012	Kerala	>20	4193	40.0
Bhagyalaxmi A	27	2013	Gujarat	15-64	1684	15.4

Hypertension was prevalent across all geographies and socio-demographic groups

1. Overall, prevalence of diabetes was 6.1% among women and 6.5% among men; for hypertension, 20.0% among women and 24.5% among men.
2. Rates of diabetes and hypertension varied widely among states.
3. Household wealth and urban location were positively associated with both conditions, and the prevalence of diabetes and hypertension among middle-aged adults in the poorest households in rural areas was also high (5.9% had diabetes and 30% had hypertension).
4. Hypertension was higher among adults under 45 than previously estimated and was higher than in Central and Eastern Europe, the region previously estimated to have the highest rates for young adults.[3]

IMPLICATIONS

1. Hypertension is an important public health problem in India.
2. Hypertension detection, awareness and its control are poor.
3. Improved detection and management can prevent hundreds of thousands of premature deaths and avoid larger number of strokes and heart attacks every year.
4. Innovative systems -based strategies are required to increase hypertension awareness and for better management of hypertension.

5. A combined approach to lowering risk with lifestyle changes and combined use of anti - hypertensive and lipid lowering therapy can reduce the cardiovascular risk by as much as 75 %.
6. We need improved systems of healthcare for widespread screening for hypertension so that it can be detected.
7. Once detected, effective BP control and reduced cardiovascular risk is best achieve
8. Appropriate pharmacotherapy with good adherence.[4]

CAUSE

1. The cause of hypertension is often not known.
2. Around 1 in every 20 cases of hypertension is the effect of an underlying condition or medication.
3. Chronic kidney disease (CKD) is a common cause of high blood pressure because the kidneys do not filter out fluid. This fluid excess leads to hypertension.
4. Hypocalcaemia leads to hypertension.
5. Hyperthyroidism and hypothyroidism can cause high blood pressure, although hypertension mechanism is not still clear.[4]

Table 3: Public health and clinic.

Strategy	Examples
Public education	• Hypertension is a major cardiovascular risk factor and one of the most important causes of strokes and heart disease. • Hypertension is most often silent and so regular BP checks are essential in all adults (>35 yrs) • Hypertension can be prevented and better controlled by adoption of prudent lifestyle combined with simple, safe and inexpensive drugs
Physician education	• Greater focus on non -communicable diseases during undergraduate education. Focus on hypertension in public health curriculum. • Hypertension as a primary care issue. Knowledge of proper management and long-term care. Physician inertia to be managed. • Importance of home monitoring, ambulatory BP measurement, combination therapy and focus on vascular risk management. Screening for hypertension among all adults by physicians or other

Opportunistic screening	• Screening for hypertension among all adults by physicians or other health care workers at every encounter at all levels of care (universal opportunistic screening). • Measurement of BP in adults once a year by trained non -physician health care workers during home visits in rural and urban areas.
Lifestyle changes	• Focus on reducing high salt in diet, reducing alcohol consumption, weight reduction, and greater physical activity. • Smoking/tobacco use cessation for overall risk reduction.
Low dose combination pharmacotherapy Control of vascular risk factors Patient empowerment	• Use of low doses of two or more individual drug combination as initial therapy. • Use of evidence based combinations. • Focus on management of all vascular risk factors- smoking, high cholesterol, other lipids, diabetes- in every hypertensive. • Polypharmacy approach in high risk persons Lifelong commitment to lifestyle changes and anti -hypertensive therapy in patients with hypertension BP self monitoring.

SIGNS

- Blood pressure can be measured by a sphygmomanometer, or blood pressure monitor.
- Having high blood pressure for a short time can be a normal response to many situations. Acute stress and intense exercise, for example, can briefly elevate blood pressure in a healthy person.
- For this reason, a diagnosis of hypertension normally requires several readings that show high blood pressure over time.
- The systolic reading of 130 mmHg refers to the pressure as the heart pumps blood around the body. The diastolic reading of 80 mmHg refers to the pressure as the heart relaxes and refills with blood %.[5]

The AHA 2017 guideline define the following ranges of blood pressure.

	Systolic (mmHg)	Diastolic (mmHg)
Normal blood pressure	Less than 120	Less than 90
Elevated	Between 120 and 129	Less than 80
Stage 1 hypertension	Between 130 and 139	Between80 and 89
Stage 2 hypertension	At least 140	At least 90
Hypertensive crisis	Over 180	Over 120

SYMPTOMS

High blood pressure may not have any symptoms and so hypertension has been labeled "the silent killer." Longstanding high blood pressure can lead to multiple complications including heart attack, kidney disease, or stroke.

Some people experience symptoms with their high blood pressure.

These symptoms include:

- Headache
- Dizziness
- Shortness of breath
- Blurred vision
- Feeling of pulsations in the neck or head
- Nausea

TYPES

High blood pressure that is not caused by another condition or disease is called primary or essential hypertension. If it occurs as a result of another condition, it is called secondary hypertension.

Primary hypertension can result from multiple factors, including blood plasma volume and activity of the hormones that regulate of blood volume and pressure. It is also influenced by environmental factors, such as stress and lack of exercise.

Secondary hypertension has specific causes and is a complication of another problem.

It can result formed: Nov 13, 2017.

- Diabetes, due to both kidney problems and nerve damage
- Kidney disease
- Pheochromocytoma, a rare cancer of an adrenal gland
- Cushing syndrome, which can be caused by corticosteroid drugs
- congenital adrenal hyperplasia, a disorder of the cortisol-secreting adrenal glands
- hyperthyroidism, or an overactive thyroid gland
- hyperparathyroidism, which affects calcium and phosphorous levels
- pregnancy
- sleep apnea

- obesity
- CKD

Treating the underlying condition should see an improvement in blood pressure.[6]

How to avoid hypertension/ precautions

Lifestyle modifications

It is essential for the prevention of high BP, and these are generally the initial steps in managing hypertension. As the cardiovascular disease risk factors are assessed in individuals with hypertension, pay attention to the lifestyles that favorably affect BP level and reduce overall cardiovascular disease risk. A relatively small reduction in BP may affect the incidence of cardiovascular disease on a population basis. A decrease in BP of 2 mm Hg reduces the risk of stroke by 15% and the risk of coronary artery disease by 6% in a given population. In a study that attempted to formulate a predictive model for the risk of prehypertension and hypertension, as well as an estimate of expected benefits from population-based lifestyle modification, investigators reported that the majority of risk factors have a larger role in prehypertension and stage 1 hypertension than in stage 2 hypertension. The investigators derived multistep composite risk scores by assessing significant risk factors in the progression from prehypertension to hypertension, as well as the regression of prehypertension to normal; they indicated that as the number of risk factors included in intervention programs increases, the size of the expected mean risk score decreases. In men, the 5-year predicted cumulative risk for stage 2 hypertension decreased from 23.6% (in the absence of an intervention program) to 14% (with 6-component intervention); the results were similar in women.

Dietary changes

Fresh fruit and vegetables should include in your diet routine.

Fig 2: Dietry foods.

A number of studies have documented an association between sodium chloride intake and BP. The effect of sodium chloride is particularly important in individuals who are middle-aged to elderly with a family history of hypertension. A moderate reduction in sodium chloride intake can lead to a small reduction in blood pressure. The American Heart Association recommends that the average daily consumption of sodium chloride not exceed 6 g; this may lower BP by 2-8 mm Hg. DASH eating plan encompasses a diet rich in fruits, vegetables, and low-fat dairy products and may lower blood pressure by 8-14 mm Hg. The 2011 ADA standard of care supports the DASH diet, with the caution that high-quality studies of diet and exercise to lower blood pressure have not been performed on individuals with diabetes. Dietary potassium, calcium, and magnesium consumption have an inverse association with BP. Lower intake of these elements potentiates the effect of sodium on BP. Oral potassium supplementation may lower both systolic and diastolic BP. Calcium and magnesium supplementation have elicited small reductions in BP. In population studies, low levels of alcohol consumption have shown a favorable effect on BP, with reductions of 2-4 mm Hg. However, the consumption of 3 or more drinks per day is associated with elevation of BP. Daily alcohol intake should be restricted to less than 1 oz of ethanol in men and 0.5 oz in women. The 2011 ADA standard supports limiting alcohol consumption in patients with diabetes and hypertension. Emerging evidence based on small randomized controlled trials suggests that dark chocolate may lower BP via improved vascular endothelial function and increased formation of nitric oxide. A meta-analysis of 13 randomized controlled trials that compared dark chocolate with placebo confirmed a significant mean SBP reduction of -3.2 mm Hg and DBP reduction of -2 mm Hg in hypertensive and prehypertensive subgroups.However, several important questions needs to be answered before dark chocolate

can be universally recommended as a lifestyle intervention. Although many studies implicate a high fructose diet as a contributing factor to the metabolic syndrome and hypertension, a 2012 review of Cochrane database disputed this relationship.[6]

Weight loss and exercise

Up to 60% of all individuals with hypertension are more than 20% overweight. The centripetal fat distribution is associated with insulin resistance and hypertension. Even modest weight loss (5%) can lead to reduction in BP and improved insulin sensitivity. Weight reduction may lower blood pressure by 5-20 mm Hg per 10 kg of weight loss in a patient whose weight is more than 10% of ideal body weight. Regular aerobic physical activity can facilitate weight loss, decrease BP, and reduce the overall risk of cardiovascular disease. Blood pressure may be lowered by 4-9 mm Hg with moderately intense physical activity. These activities include brisk walking for 30 minutes a day, 5 days per week. More intense workouts of 20-30 minutes, 3-4 time a week, may also lower BP and have additional health benefits. Blumenthal et al found that in overweight or obese patients with high BP, adding exercise and weight loss to the DASH diet resulted in even larger reductions in BP and cardiovascular biomarkers of risk. The trial showed that after 4 months, clinic-measured BP was reduced by 16.1/9.9 mm Hg in patients in the DASH-plus-weight management group; by 11.2/7.5 mm Hg in the DASH-alone group; and by 3.4/3.8 mm Hg in a control group eating a usual diet. Compared with DASH alone, DASH plus weight management also resulted in greater improvement in pulse wave velocity, baroreflex sensitivity, and left ventricular mass. The 2016 and 2017 ADA diabetes standards support increasing physical activity. The recommendations emphasize that exercise is an important part of diabetes management in addition to reducing cardiovascular risk factors, contributing to weight loss, and improving overall well-being. Moreover, patients with diabetes and severe hypertension (SBP ≥140 mm Hg or DBP ≥90 mm Hg) at diagnosis or afterward should receive drug therapy along with lifestyle modifications.[7]

TREATMENT

Changing your lifestyle can go a long way toward controlling high blood pressure. Your doctor may recommend you make lifestyle changes including:

1. Eating a heart-healthy diet with less salt
2. Getting regular physical activity
3. Maintaining a healthy weight or losing weight if you're overweight or obese

4. Limiting the amount of alcohol you drink

But sometimes lifestyle changes aren't enough. In addition to diet and exercise, your doctor may recommend medication to lower your blood pressure.

1. Your blood pressure treatment goal depends on how healthy you are.
2. Your blood pressure treatment goal should be less than 130/80 mm Hg if:
3. You're a healthy adult age 65 or older
4. You're a healthy adult younger than age 65 with a 10 percent or higher risk ofdeveloping cardiovascular disease in the next 10 years
5. You have chronic kidney disease, diabetes or coronary artery disease

Although 120/80 mm Hg or lower is the ideal blood pressure goal, doctors are unsure if you need treatment (medications) to reach that level.[15,16] If you're age 65 or older, and use of medications produces lower systolic blood pressure (such as less than 130 mm Hg), your medications won't need to be changed unless they cause negative effects to your health or quality of life. The category of medication your doctor prescribes depends on your blood pressure measurements and your other medical problems. It's helpful if you work together with a team of medical professionals experienced in providing treatment for high blood pressure to develop an individualized treatment plan.[8,9]

MEDICATIONS TO TREAT HIGH BLOOD PRESSURE

Thiazide diuretics

1. Diuretics, sometimes called water pills, are medications that act on your kidneys to help your body eliminate sodium and water, reducing blood volume.
2. Thiazide diuretics are often the first, but not the only, choice in high blood pressure medications. Thiazide diuretics include chlorthalidone, hydrochlorothiazide (Microzide) and others.
3. If you're not taking a diuretic and your blood pressure remains high, talk to your doctor about adding one or replacing a drug you currently take with a diuretic. Diuretics or calcium channel blockers may work better for people of African heritage and older people than do angiotensin-converting enzyme (ACE) inhibitors alone. A common side effect of diuretics is increased urination.[17,18]

Angiotensin-converting enzyme (ACE) inhibitors

These medications such as lisinopril (Zestril), benazepril (Lotensin), captopril (Capoten) and others help relax blood vessels by blocking the formation of a natural chemical that narrows blood vessels. People with chronic kidney disease may benefit from having an ACE inhibitor as one of their medications.[10,11]

Angiotensin II receptor blockers (ARBs)

These medications help relax blood vessels by blocking the action, not the formation, of a natural chemical that narrows blood vessels. ARBs include candesartan (Atacand), losartan (Cozaar) and others. People with chronic kidney disease may benefit from having an ARB as one of their medications.

Calcium channel blockers

These medications including amlodipine (Norvasc), diltiazem (Cardizem, Tiazac, others) and others help relax the muscles of your blood vessels. Some slow your heart rate. Calcium channel blockers may work better for older people and people of African heritage than do ACE inhibitors alone. Grapefruit juice interacts with some calcium channel blockers, increasing blood levels of the medication and putting you at higher risk of side effects. Talk to your doctor or pharmacist if you're concerned about interactions.

Additional medications sometimes used to treat high blood pressure

If you're having trouble reaching your blood pressure goal with combinations of the above medications, your doctor may prescribe:

1. **Alpha blockers:** These medications reduce nerve impulses to blood vessels, reducing the effects of natural chemicals that narrow blood vessels. Alpha blockers include doxazosin (Cardura), prazosin (Minipress) and others.
2. **Alpha-beta blockers:** In addition to reducing nerve impulses to blood vessels, alpha-beta blockers slow the heartbeat to reduce the amount of blood that must be pumped through the vessels. Alpha-beta blockers include carvedilol (Coreg) and labetalol (Trandate).
3. **Beta blockers:** These medications reduce the workload on your heart and open your blood vessels, causing your heart to beat slower and with less force. Beta blockers include acebutolol (Sectral), atenolol (Tenormin) and others.Beta blockers aren't usually recommended as the only medication you're prescribed, but they may be effective when combined with other blood pressure medications.

4. **Aldosterone antagonists**. Examples are spironolactone (Aldactone) and eplerenone (Inspra). These drugs block the effect of a natural chemical that can lead to salt and fluid retention, which can contribute to high blood pressure.
5. **Renin inhibitors**. Aliskiren (Tekturna) slows down the production of renin, an enzyme produced by your kidneys that starts a chain of chemical steps that increases blood pressure.

   Aliskiren works by reducing the ability of renin to begin this process. Due to a risk of serious complications, including stroke, you shouldn't take aliskiren with ACE inhibitors or ARBs.
6. **Vasodilators.** These medications, including hydralazine and minoxidil, work directly on the muscles in the walls of your arteries, preventing the muscles from tightening and your arteries from narrowing.
7. **Central-acting agents.** These medications prevent your brain from signaling your nervous system to increase your heart rate and narrow your blood vessels. Examples include clonidine (Catapres, Kapvay), guanfacine (Intuniv, Tenex) and methyldopa.

To reduce the number of daily medication doses you need, your doctor may prescribe a combination of low-dose medications rather than larger doses of one single drug. In fact, two or more blood pressure drugs often are more effective than one. Sometimes finding the most effective medication or combination of drugs is a matter of trial and error.[12, 13, and 14]

CONCLUSION

High rates of hypertension in India total awereness, treatment, lifestyle modification can cause normal hypertension and regular execise.hypertension management is everybody''s responsibility.the prevalence studies in rural and urban population. Antihypertension continues to be major public health problem.

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