



A review on Hypertension

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Abstract

Hypertension is a very common, chronic age-condition with severe cardiovascular and renal complications. Hypertension is the most important cause of mortality. It is preventable with medication and change in lifestyle. Office blood pressure, ambulatory blood pressure monitoring for out-of-office blood pressure measurement and self-blood pressure measurement at home are reliable data important for assessing hypertension. The primary type of hypertension can be described as the high BP of unknown cause that arises from cardiovascular risk factors stemming from new environmental and lifestyle factors. Secondary hypertension can be caused by a variety of toxicities and congenital diseases. The complication of hypertension can be medically described as the clinical results of persistently high BP that cause cardiovascular disease (CVD), atherosclerosis, kidney disease, diabetes mellitus, metabolic syndrome, preeclampsia, erectile dysfunction, and eye disease. Treatment measures for high blood pressure involve lifestyle modifications that include diet rich in fruits, vegetables, and low-fat food or fish with reduced content of saturated and total fat, salt restriction, proper body weight, regular exercise, moderate alcohol consumption, smoking cessation, and drug therapies, which differ slightly according to varying published hypertension treatment guidelines.

Introduction

Hypertension is one of the most common global health problems as about more than 20% of all adults across the world are suffering from high blood pressure. According to estimates, more than 20% of adults globally suffer with hypertension, making it one of the most prevalent health issues in the world. The health requirements of developing nations are changing dramatically. A public health concern is being created by the rising incidence of chronic illnesses like hypertension [1]. Hypertension is becoming more common in older adults, women, and youth. According to the Iraqi national census on risk factors for chronic diseases conducted in 2006, 40.4% of Iraqi adults have high blood pressure. In addition, hypertension is regarded as one of the most significant modifiable risk factors for peripheral vascular disorders, end-stage renal disease, coronary heart disease, stroke, and congestive heart failure. Atrial fibrillation presents a considerable public health burden

and is the most common type of arrhythmia affecting around 1–2% of the general population, increasing to around 10% of persons by 80 years of age [3]. Hypertension also damages the microvasculature. Micro vascular rarefaction, referring to a reduction in vascular density including both capillaries and arterioles, is present in both human and animal models of hypertension [4, 5].

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Definition of hypertension:

According to the guidelines of the 7th Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7) and the World Health Organization (WHO)/International Society of Hypertension (ISH), hypertension is defined as follows in adults who are 18 years of age or older: Systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg on the average of two or more readings taken at each of two or more visits following initial screening [6, 7, 8, 9].

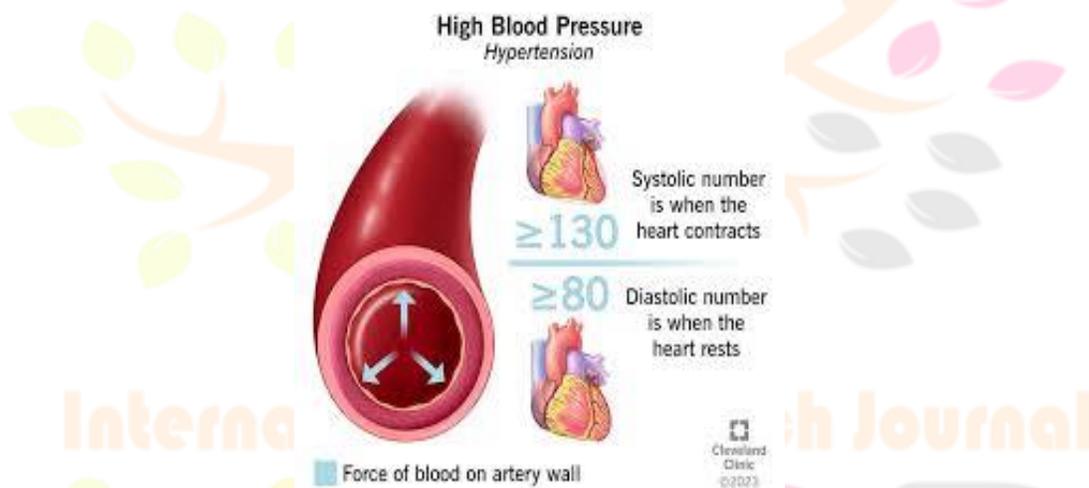


Fig no.1

Classification of hypertension:

When people talk about hypertension, they are usually referring to one of the two types are:

- **Primary hypertension**
- **Secondary hypertension**

Primary hypertension: Another name for primary hypertension is essential hypertension. There is no known etiology for this type of hypertension, which is the most common [7]. Amphetamines, antidepressants, and even coffee are among the chemicals that can cause hypertension.

Secondary hypertension: Secondary hypertension can be brought on by a pharmaceutical side effect or an underlying illness. Secondary hypertension has been associated with diabetes, sleep apnea, and thyroid dysfunction [8, 9].

Hypertension in developing countries:

Healthcare resources and areas where people are not well-informed about high blood pressure and inadequate blood pressure management [11, 12]. In India, the prevalence of hypertension has become ten times more common in rural populations over the age of 36 and thirty times more common in urban inhabitants over the age of 25 [13]. High prevalence rates of hypertension have not changed or are increasing in the developing world, despite trends showing a decline in the prevalence of the condition. Nearly three-quarters of hypertensive individuals (639 million) reside in developing nations, while only a small number of Western industrialized nations have improved awareness, treatment, and control rates. Between 1980 and 2008, systolic blood pressure (SBP) increased in developing nations while falling in high-income nations [14]. According to current WHO statistics from 2016 [15], patients in impoverished countries are responsible for paying the majority of their medical expenses out of pocket.

Signs and symptoms:

People with very high blood pressure (usually 180/120 or higher) can experience symptoms including:

- Severe headaches.
- Chest pain.
- Dizziness.
- Difficulty breathing.
- Nausea.
- Vomiting.
- Blurred vision or other vision changes.
- Anxiety.
- Confusion.
- Buzzing in the ears.
- Nose bleeds.
- Abnormal heart rhythm [16].

➤ As high blood pressure is asymptomatic, it does not exhibit any obvious signs. Because it has the potential to harm the cardiovascular system, high blood pressure is often known as "the silent killer" [22].

➤ Additionally, high blood pressure may cause issues with specific organs. Complications like arteriosclerosis, in which the formation of plaque narrows the blood arteries.

➤ A hypertensive crisis that necessitates prompt medical intervention may be indicated by systolic blood pressure readings of 180 mmHg or higher and diastolic blood pressure readings of 110 mmHg or higher [21].

➤ Hypertension seldom exhibits symptoms; instead, it is often identified by screening or when a patient visits the doctor for a different problem. Along with headaches, some people with high blood pressure also have vertigo, lightheadedness, blurred vision, fainting spells, and tinnitus.

However, these symptoms can be related to the underlying worry rather than the high blood pressure itself. During a physical examination, hypertension may be connected to anomalies in the ocular fund observed via an ophthalmoscope. It might be difficult to tell the difference between grades I and II, which vary from I to IV in terms of how severe the changes characteristic of hypertensive retinopathy are. There is a rough correlation between the degree of retinopathy and the duration or severity of hypertension [17].

Etiology:

Stress-related behaviors like smoking, drinking alcohol, or eating more can raise blood pressure even more. High blood pressure can result from a number of chronic disorders, including diabetes, sleep apnea, kidney disease, lung disease, including a variety of renal diseases, and medicines [18].

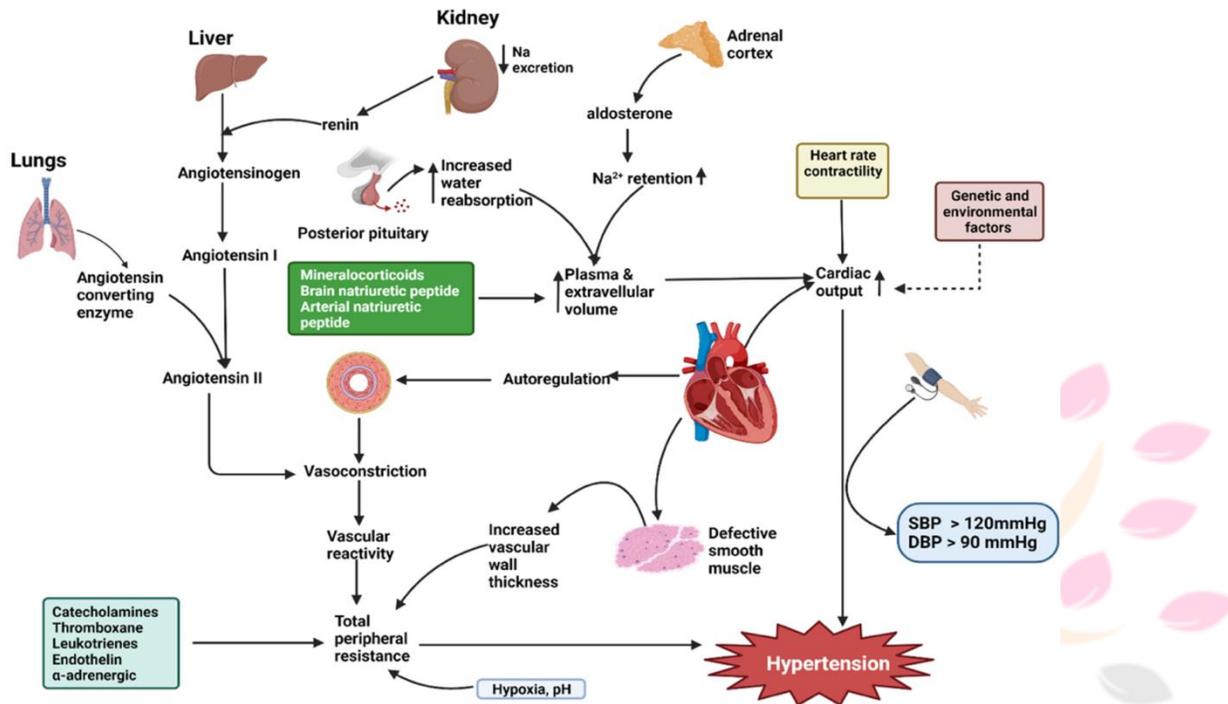


Fig no.2

Risk factors for high blood pressure:

Risk factors that make you more likely to have high blood pressure include are

- Having biological family members likely to have blood pressure. Cardiovascular disease or diabetes.
- Aged over 55
- Having certain medical condition, include chronic kidney disease, metabolic syndrome, obstructive sleep apnea or thyroid disease.
- Having overweighting or obesity.
- Lack of exercise.
- Eating foods high in sodium.
- Smoking or using tobacco products.
- Drinking too much [16].

Diagnosis:

- Kidney ultrasound imaging.
- Urine tests.
- Blood tests.
- Electrocardiogram.

1. Kidney ultrasound imaging

An ultrasound of renal arteries is a type of vascular study that focuses on blood vessels in the kidneys. It is a group of arteries in the kidneys, also referred to as renal arteries, which transport blood coming from the heart. The buildup of plaques sometimes causes obstruction and narrowing of arteries. That leads to kidney failure or high blood pressure [28].

2. Urine test

For example, a urine sample could contain markers that may hint at certain medical conditions causing high blood pressure. Ultrasound of the kidneys many cases of kidney diseases are linked to secondary hypertension. This noninvasive test is conducted by a technician who moves a small, hand-held device called a transducer over the area to be tested [19, 20].

3. Blood test or Blood pressure test

If the blood pressure measurement is 130/80 millimeters of mercury (mm Hg) or higher, it is considered high blood pressure (hypertension) [26]. The average of two or more readings obtained at different times is typically used to diagnose high blood pressure. Blood pressure is categorized based on its level of elevation [27].

4. Electrocardiogram (or) ECG Test

It is a noninvasive test known as an electrocardiogram (ECG) measures the electrical activity of the heart on paper. ECG is useful in assessing for heart muscle injury, such as heart attacks, and/or heart wall/muscle thickening/hypertrophy, which are frequent side effects of high blood pressure [29].

Medical History and Physical Examination:

Prevention:

Lifestyle changes can help reduce high blood pressure and can benefit any patient with hypertension. Most patients who make those lifestyle changes will still need to take medicine. All these lifestyle changes have been shown to prevent high blood pressure and also reduce elevated levels [28].

Do:

- Consume extra vegetables.
- More physically active, which can include walking, running, swimming, dancing.
- Get at least 150 minutes per week of moderate-intensity aerobic activity or 75 minutes per week of vigorous aerobic activity.
- Do strength building exercises 2 or more days each week.
- Lose weight if you're overweight or obese.
- Take medicines as prescribed by your health care professional.
- Keep appointments with your health care professional [29].

Don't:

- Eat too much salty food (try to stay under 2 grams per day).
- Eat foods high in saturated or fats.
- Smoke or use tobacco.
- Drink too much alcohol (1 drink daily max for women, 2 for men).
- Reducing hypertension prevents heart attack, stroke and kidney damage, as well as other health problems.

Reduce the risks of hypertension by:

- Reducing and managing stress.
- Regularly checking blood pressure.
- Treating high blood pressure.
- Managing other medical conditions.
- Reducing exposure to polluted air [23, 24, 25].

Drugs used for the treatment of hypertension:

There are multiple classes of antihypertensive medications used for the treatment of HTN; the most recommended classes used as first-line for treatment are:

1.	ACE inhibitor (angiotensin converting enzyme inhibitors)	<ul style="list-style-type: none"> • Lisinopril. • Ramlpril. • Captopri
2.	Calcium channel blockers	<ul style="list-style-type: none"> • Amlodipine • Felodipine • Nimodipine • Nifedipine • Isradipine • Bisoprolol • Verapamil
3.	Angiotensin 2 receptor blockers(ARBs)	<ul style="list-style-type: none"> • Azilsartan (Edarbi). • Candesartan (Atacand). • Irbesartan (Avapro). • Losartan (Cozaar). • Olmesartan (Benicar). • Telmisartan (Micardis). • Valsartan (Diovan).
4.	Beta blockers	<ul style="list-style-type: none"> • Atenolol (also called Tenormin) • Bisoprolol (also called Cardicor or Emcor) • Carvedilol. • Labetalol (also called Trandate) • Metoprolol (also called Betaloc or Lopresor) • propranolol (also called Inderal or Angilol) • Sotalol.
5.	Diuretics	<ul style="list-style-type: none"> ➤ Examples of thiazide diuretics include: <ul style="list-style-type: none"> • Chlorothiazide. • Chlorthalidone. • Hydrochlorothiazide. • Indapamide.

		<ul style="list-style-type: none"> • Metolazone. ➤ Examples of loop diuretics include: <ul style="list-style-type: none"> • Bumetanide (Bumex). • Ethacrynic acid (Edecrin). • Furosemide (Lasix). • Torsemide (Soanz). ➤ Examples of potassium-sparing diuretics include: <ul style="list-style-type: none"> • Amiloride (Midamor). • Eplerenone (Inspra). • Spironolactone (Aldactone, Carospir). • Triamterene (Dyrenium).
6.	Alfa blockers	<ul style="list-style-type: none"> ➤ Non-selective α-adrenergic receptor antagonists include: <ul style="list-style-type: none"> • Phenoxybenzamine • Phentolamine • Tolazoline • Trazodone ➤ Selective α_1-adrenergic receptor antagonists include: <ul style="list-style-type: none"> • <u>Alfuzosin</u>^[4] • <u>Doxazosin</u> • <u>Prazosin (inverse agonist)</u> • <u>Tamsulosin</u> • <u>Terazosin</u>^[8] • <u>Silodosin</u>^[9] ➤ Selective α_2-adrenergic receptor antagonists include: <ul style="list-style-type: none"> • <u>Atipamezole</u> • <u>Idazoxan</u> • <u>Mirtazapine</u> • <u>Yohimbine</u>

Conclusion:

Hypertension is one of the public health challenges. It contributes the largest burden of disease in the world today. Improving health outcomes around the world would require coordinated efforts globally to try to tame the burden of hypertension. Hypertension left uncontrolled will lead to other health problems such as kidney disease, heart disease, and stroke. Patients with hypertension will enjoy more benefits when doing at least thirty minutes per day of moderate intensity aerobic activities. The individuals must complete at least 2.5 hours per week of moderate intensity aerobic physical activity or one hundred and fifty minutes a week of vigorous intensity aerobic physical activity. This will reduce systolic blood pressure by 4 mm Hg and diastolic blood pressure by 2.5 mm Hg.

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