ISSN: 0975-8232

IJPSR (2010), Vol. 1, Issue 8 (Review Article)

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received on 26 March, 2010; received in revised form 14 June, 2010; accepted 19 July, 2010

ROLE OF COMMUNITY PHARMACIST; CARE OF HYPERTENSIVE PATIENTS

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Keywords:

Hypertension,
Cardiovascular Disease,
Pharmacotherapy,
LDL,
HDL,
Angiotensin

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ABSTRACT

The community pharmacist, being an important member of the healthcare team and society, can make successful efforts to counsel the sufferer and guide him about this disease. Pharmacist is now becoming more patient oriented than product oriented and have brought many changes in life of patients. Hypertension or high blood pressure is a condition in which the blood pressure in the arteries is chronically elevated. With every heart beat, the heart pumps blood through the arteries to the rest of the body. Blood pressure is the force of blood that is pushing up against the walls of the blood vessels. If the pressure is too high, the heart has to work harder to pump, and this could lead to organ damage and several illnesses such as heart attack, stroke, failure, aneurysm, or renal failure. Cardiovascular diseases 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. Hypertension can best be prevented by adjusting your lifestyle so that proper diet and exercise are key components. It is important to maintain a healthy weight, reduce salt intake, reduce alcohol intake, and reduce stress. Pharmacotherapy for hypertension therefore offers a substantial potential for cost savings. Recent studies proved that the use of angiotensin receptor blockers for treatment of hypertension is cost-saving and cost-effective treatment compared with other conventional treatment. The role of community pharmacist needs to be realized not only for the healthcare system to perform better but also for the development of pharmacy profession.

INTRODUCTION: High blood pressure (hypertension) is designated as either essential (primary) hypertension or secondary hypertension and is defined as a consistently elevated blood pressure exceeding 140/90 mm Hg. In essential hypertension (95% of people with hypertension), no specific cause is found, while secondary hypertension (5% of people with hypertension) is caused by an abnormality somewhere in the body, such as in the kidney, adrenal gland, or aortic artery. Essential hypertension may run in some families and occurs more often in the African American population, although the genes for essential hypertension have not yet been identified. High salt intake, obesity, lack of regular exercise, excessive alcohol or coffee intake, and smoking may all adversely affect the outlook for the health of an individual with hypertension [1, 2].

High blood pressure is called "the silent killer" because it often causes no symptoms for many years, even decades, until it finally damages certain critical organs. Poorly controlled hypertension ultimately can cause damage to blood vessels in the eye, thickening of the heart muscle and heart attacks, hardening of the arteries (arteriosclerosis), kidney failure, and strokes. Heightened public awareness and screening of the population are necessary to detect hypertension early enough so it can be treated before critical organs are damaged. Lifestyle adjustments in diet and exercise and compliance with medication regimes are important factors in determining the outcome for people with hypertension [5, 6]. Several classes of anti-hypertensive medications are available, including ACE inhibitors, ARB drugs, beta-blockers, diuretics, calcium channel blockers, alpha- blockers, and peripheral vaso-dilators. Most anti- hypertensive medications can be used alone or in combination: some are used only in combination; some are preferred over others in certain specific medical situations; and some are not to be used (contraindicated) in other situations. The goal of therapy for hypertension is to bring the blood pressure down to 140/85 in the general population and to even lower levels in diabetics, African Americans, and people with certain chronic kidney diseases. Screening, diagnosing, treating, and controlling hypertension early in its course can significantly reduce the risk of developing strokes, heart attacks, or kidney failure. The attributes 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 in order to prevent damage to critical organs and conditions such as stroke, heart attack, and kidney failure that may be caused by high blood pressure, it is important to screen, diagnose, treat, and control hyper tension in its earliest stages [3, 4]. This can also be accomplished by increasing public awareness and increasing the frequency of screenings for the condition.

Role of Pharmacist Care of Hypertensive Patients: Pharmacist plays an important role in patient healthcare. Clinical pharmacists posses in-depth knowledge of new knowledge of medications that is integrated with a fundamental understanding of the biomedical, pharmaceutical, socio- bio behavioral and clinical sciences, he also assumes the responsibility and accountability for managing medication therapy in direct hypertensive patient care setting whether practicing independently or in consultation with other health care, due to free accessibility and friendly approach, pharmacists are placed at first point

of contact [9, 10]. The practice of clinical pharmacy embraces the philosophy of pharmaceutical care as a discipline; clinical pharmacy also has an obligation to contribute to the generation of new knowledge that advances health and quality of life. Pharmacists are uniquely positioned and most easily accessible healthcare professionals in the community. Even in developing countries like India, most of the people communicate and take treatment advice on minor ailments from pharmacist only.

Among all Healthcare Professionals, pharmacist is the one who have wide compass and can communicate with people most effectively. Community pharmacist is only healthcare professional who will interact with several individuals each day and this is major platform to communicate with common individuals. In India large number of patient pool goes directly to pharmacies and depends on pharmacist to tell them what medicines to take. Major role of community pharmacist is to educate consumers on preventive measures and disseminate concise and up-to-date information to the public [7, 8].

Causes of High Blood Pressure: In most cases of high blood pressure, the American Heart Association says there is no one identifiable cause. This kind of high blood pressure is called primary hypertension or essential hypertension [10, 11]. It is usually a combination of factors, such as:

- Weight. The greater your body mass, the more pressure there is on your artery walls. That's because more blood is produced to supply oxygen and nutrients to tissues in your body.
- Activity level. Lack of physical activity tends to increase heart rate, which forces your heart to work harder with each contraction.
- Tobacco use. Chemicals in cigarettes and tobacco can damage artery walls.
- Sodium intake. Excessive sodium in the diet can result in fluid retention and high blood pressure, especially in people sensitive to sodium.
- Potassium intake. Low potassium can result in elevated sodium in cells, because the two balance one another.
- Stress. Stress can raise blood pressure.
- Alcohol consumption. Excessive alcohol intake can, over time, increase the risk of heart disease.
- Age. The risk of high blood pressure increases as you get older.
- Family history. High blood pressure often runs in families.

High blood pressure can also be caused by an underlying condition, such as kidney disease, hormonal disorders, thyroid disease, adrenal gland disease, and the use of certain drugs, such as oral contraceptives, or herbs such as licorice. This type of high blood pressure is called secondary hypertension.

High Blood Pressure Symptoms: High blood pressure usually causes no symptoms. Even if high blood pressure does cause symptoms, the symptoms are usually mild and nonspecific (vague or suggesting many different disorders). Thus, high blood pressure often is labeled "the silent killer."People who have high blood pressure typically don't know it until their blood pressure is measured [11, 12]. Sometimes people with high blood pressure have the following symptoms:

- Headache
- Dizziness

- Blurred vision
- Nausea

People often do not seek medical care until they have symptoms arising from the organ damage caused by chronic (ongoing, long-term) high blood pressure. The following types of organ damage are commonly seen in chronic high blood pressure:

- Heart attack
- Heart failure
- Stroke or "mini stroke" (transient ischemic attack, TIA)
- Kidney failure
- Eye damage with loss of vision
- Peripheral arterial disease
- Outpouchings of the aorta, called aneurysms

About 1% of people with high blood pressure do not seek medical care until the high blood pressure is very severe, a condition known as malignant hypertension. In malignant hypertension, the diastolic blood pressure (the lower number) often exceeds 140 mm Hg. Malignant hypertension may be associated with headache, light-headedness, or nausea. This degree of high blood pressure requires emergency hospitalization and lowering of blood pressure to prevent brain hemorrhage or stroke. It is of utmost importance to realize that high blood pressure can be unrecognized for years, causing no symptoms but causing progressive damage to the heart, other organs, and blood vessels.

Exams and Tests: The only way to tell whether you have high blood pressure is to have it measured with a blood pressure cuff (sphygmomanometer). This device consists of a gauge and a rubber cuff that is placed around your arm and inflated. Having your blood pressure measured is painless and takes just a few minutes. Blood pressure (BP) is classified as follows:

- Normal BP – Systolic: less than 120 mm Hg; diastolic: less than 80 mm Hg
- Pre- hypertension - Systolic 120-139 or diastolic 80-89 mm Hg
- High BP
    - Stage 1 – Systolic: 140-159; diastolic: 90-99 mm Hg
    - Stage 2 – Systolic: more than 160; diastolic: more than 100 mm Hg

- Tests will be ordered to check for causes of high blood pressure and to assess any organ damage from high blood pressure or its treatment. These tests may include the following:

- Blood tests including measurement of electrolytes, blood urea, and creatinine levels (to assess potential kidney damage)
- Lipid profile for levels of various kinds of cholesterol
- Special tests for hormones of the adrenal gland or thyroid gland
- Urine tests for electrolytes and hormones

A noninvasive, painless eye examination with an ophthalmoscope will look for ocular damage. Ultrasound of the kidneys, CT scan of the abdomen, or both may be done to assess damage or enlargement of the kidneys and adrenal glands. Any of the following may be performed to detect damage to the heart or blood vessels:

- Electrocardiogram (ECG) is a noninvasive test that detects the electrical activity of the heart and records it on paper. ECG is helpful for quantitating any damage of

the heart muscle, such as heart attack, and/or thickening/hypertrophy of the heart wall/muscle, common complications of high blood pressure.

- Echocardiogram is an ultrasound examination of the heart taken through the chest. Sound waves take a picture of the heart as it beats and relaxes and then transmits these images to a video monitor. The echo can detect problems with the heart such as enlargement, abnormalities in motion of the heart wall, blood clots, and heart valve abnormalities. It also gives a good measurement of the strength of the heart muscle (ejection fraction). The echocardiogram is more accurate than an ECG, but also more expensive.
- A plain chest x-ray primarily provides an estimate of the size of the heart, but it is much less specific than echocardiography, which looks inside the heart.
- Doppler ultrasound is used to check blood flow through arteries at pulse points in your arms, legs, hands, and feet. This is an accurate way to detect peripheral, which can be associated with high blood pressure. It also can depict the arteries to both kidneys and sometimes depicts narrowing that can lead to high BP in a minority of patients [14, 15].

Self-Care at Home: The management and control of high blood pressure involves two major options, lifestyle modification (detailed here) and medications (detailed in Treatment);

- Lifestyle options include changing what you eat and your activity level.
- Quitting smoking and moderating alcohol consumption will also help keep your blood pressure in the healthy range.
- Maintain a healthy weight.
- If you are overweight or obese, lose weight. Aim for a healthy weight range for your height and body type. Your health care provider can help you calculate a target weight.
- Even a small amount of weight loss can make a major difference in lowering or preventing high blood pressure.
- To lose weight, you must burn more calories than you take in.
- Crash or fad diets are not helpful and may be dangerous.
- Some weight loss medications also carry major risks and may even elevate blood pressure, and great caution is advised in using these drugs.
- The healthiest and longest-lasting weight loss requires slow loss, such as losing one-half to one pound each week. Eating 500 calories less than you burn every day may help achieve this goal. In a week, you will eat 3500 calories less than you burn, which is enough to lose one pound.
- Increasing your physical activity will help you burn more calories.
- Lose weight and keep it off.
- Choose foods low in calories and fat. Fat is a concentrated source of calories. You should cut down on butter, margarine, regular salad dressing, fatty or red meats, the skin of poultry, whole milk, cheese, fried foods, ice cream, many cookies, cakes, pastries, and snacks.
- Instead, choose baked, broiled, or poached chicken and turkey (without skin), fish, lean cuts of meat (such as round or sirloin); skim, 1%, or evaporated milk; lower fat, low-sodium cheeses; fresh, frozen, or canned fruit or vegetables (without butter, cream, or cheese sauces); plain whole wheat rice and pasta; whole wheat English

muffins; whole wheat bagels; whole wheat sandwich bread and rolls; soft tortillas; cold (ready-to-eat) and hot whole-grain cereals (avoid "instant" types, which are high in sodium).

- Choose foods high in starch and fiber: These foods are low in fat and also good sources of vitamins and minerals. Try fruits, vegetables, whole-grain cereals, whole wheat pasta, rice, and dry peas and beans.
- Limit serving sizes: You should especially try to take smaller helpings of high-calorie foods such as meats and cheeses. Try to avoid the temptation of going back for seconds.
- Write down what you eat and when: It may be helpful to track your habits. You should note where you are and what you are doing when you snack on high-calorie foods. For instance, many people snack while watching television. Or do you skip breakfast and then eat a large lunch? Identifying your eating patterns can help you overcome the situations in which you overeat.
- Replace high-calorie, high-fat snacks with fresh fruits, air-popped popcorn (without salt or butter), or unsalted pretzels. If there is no time for breakfast, take a low-fat muffin, a bagel (without cream cheese), or whole-grain cereal along to eat at work. This will reduce the craving for a large lunch [16, 17].

Exercise or Increase Physical Activity: Physical activity burns calories, helps you lose weight, and reduces stress. Physical activity reduces total cholesterol and bad cholesterol (LDL) and raises the good cholesterol (HDL). The American Heart Association (AHA) recommends at least 30 minutes of exercise every other day for cardio-vascular fitness. The General recommends 30 minutes of physical activity on most days of the week.

Medications: Medications most often prescribed for high blood pressure include the following:

- **Water pills (diuretics):** Diuretics are used very widely to control mildly high blood pressure, and are often used in combination with other medications. They increase sodium excretion and urine output and decrease blood volume. The sensitivity to the effect of other hormones in your body is decreased. Example - Hydrochlorothiazide (HydroDIURIL)

- **Beta- blockers:** Beta- blockers reduce heart rate and decrease the force of heart contraction, thereby reducing the pressure generated by the heart. They are preferred for people who have associated coronary heart disease, angina, or history of a heart attack, since they also prevent recurrent heart attacks and sudden death. Examples- Carvedilol (Coreg), metoprolol(Lopressor), atenolol (T enormin). Side effects- Fatigue, depression, impotence, nightmares.

- **Calcium Channel Blockers:** Calcium channel blocking agents work by relaxing the muscle in the walls of the arteries. They also reduce the force of contraction of the heart. Examples- Nifedipine (Procardia), diltiazem (Cardize m), verapamil (Isoptin,Calan), nicardipine (Cardene), amlodipine (Norvasc), felodipine (Plendil). Side effects - Ankle swelling, fatigue, headache, constipation, flushing.

- **Angiotensin-Converting Enzyme (ACE) Inhibitors:** ACE inhibitors stop the production of a chemical called angiotensin II, a very potent chemical that causes blood vessels to contract, a cause of high blood pressure. Blockage of this chemical causes the blood vessels to relax. Examples - Captopril (Capoten), enalapril (Vasotec), lisinopril (Zestril,rinivil),quinapril (Accupril), fosinopril (Monopril). Side effects are infrequent but sometimes they can worsen kidney function and raise blood potassium levels, especially in patients with damaged kidneys. ACE inhibitors sometimes cause dry cough and rarely angioedema (severe swelling around the trachea/windpipe).

- **Angiotensin Receptor Blockers or ARBs:** ARBs work on receptors in tissues all over the body to prevent uptake of angiotensin II, and therefore inhibit the vasoconstrictor effect of angiotensin II. Examples- Losartan (Cozaar), valsartan (Diovan), cand esartan (Atacand), andirbesartan (Avapro). Side effects tend to be less with ARBs than ACEIs with much less cough.

- **Alpha-Blockers:** Alpha-blockers relax blood vessels by blocking messages from the nervous system that cause muscular contraction. Examples-
  Terazosin (Hytrin), doxazosin (Cardura)

- **Blockers of Central Sympathetic (Autonomic Nervous) System:** These agents block messages out of the brain from the autonomic nervous system that contract blood vessels. The autonomic nervous system is the part of the nervous system that is automatic and controls heart rate, breathing rate, and other basic functions. The effect of these drugs is to relax blood vessels, thus lowering blood pressure. These agents are not as popular because of excessive side effects, and no randomized trials demonstrate their effectiveness in lowering heart attacks, strokes, etc. Example - Clonidine (Catapres)

- **Direct Vasodilators:** Direct vasodilators relax (dilate) the blood vessels to allow blood to flow under lower pressure. These medications are often given through an IV line in an emergency (that is in malignant hypertension). Examples- Nitroprusside (Nitropress), diazoxide (Hype rstat), Oral medications is hydralazine and minoxidil.

Secondary High Blood Pressure: As mentioned previously, 5% of people with hypertension have what is called secondary hypertension. This means that the hypertension in these individuals is secondary to (caused by) a specific disorder of a particular organ or blood vessel, such as the kidney, adrenal gland, or aortic artery.

Renal (Kidney) Hypertension: Diseases of the kidneys can cause secondary hypertension. This type of secondary hypertension is called renal hypertension because it is caused by a problem in the kidneys. One important cause of renal hypertension is narrowing (stenosis) of the artery that supplies blood to the kidneys (renal artery). In younger individuals, usually women, the narrowing is caused by a thickening of the muscular wall of the arteries going to the kidney (fibro muscular hyperplasia). In older individuals, the narrowing generally is due to hard, fat-containing (atherosclerotic) plaques that are blocking the renal artery. How does narrowing of the renal artery cause hypertension?

First, the narrowed renal artery impairs the circulation of blood to the affected kidney. This deprivation of blood then stimulates the kidney to produce the hormones, rennin and angiotensin. These hormones, along with aldosterone from the adrenal gland cause a constriction and increased stiffness (resistance) in the peripheral arteries throughout the body, which results in high blood pressure. Renal hypertension is usually first suspected when high blood pressure is found in a young individual or a new onset of high blood pressure is discovered in an older person. Screening for renal artery narrowing then may include renal isotope (radioactive) imaging, ultrasonographic (sound wave) imaging, or magnetic resonance imaging (MRI) of the renal arteries. The purpose of these tests is to determine whether there is a restricted blood flow to the kidney and whether angioplasty (removal of the restriction in the renal arteries) is likely to be beneficial. However, if the ultrasonic assessment indicates a high resistive index within the kidney (high resistance to blood flow), angioplasty may not improve the blood pressure because chronic damage in the kidney from long-standing hypertension already exists. If any of these tests are abnormal or the doctor's suspicion of renal artery narrowing is high enough, renal angiography (an x-ray study in which dye is injected into the renal artery) is done.

Angiography is the ultimate test to actually visualize the narrowed renal artery. A narrowing of the renal artery may be treated by balloon angioplasty. In this procedure, the physician threads a long narrow tube (catheter) into the renal artery. Once the catheter is there, the renal artery is widened by inflating a balloon at the end of the catheter and placing a permanent stent (a device that stretches the narrowing) in the artery at the site of the narrowing. This procedure usually results in an improved blood flow to the kidneys and lower blood pressure. Moreover, the procedure also preserves the function of the kidney that was partially deprived of its normal blood supply. Only rarely is surgery needed these days to open up the narrowing of the renal artery. Any of the other types of chronic kidney disease that reduces the function of the kidneys can also cause hypertension due to hormonal disturbances and/or retention of salt. It is important to remember that not only can kidney disease cause hypertension, but hypertension can also cause kidney disease. Therefore, all patients with high blood pressure should be evaluated for the presence of kidney disease so they can be treated appropriately [12, 14].

Adrenal Gland Tumors: Two rare types of tumors of the adrenal glands are less common, secondary causes of hypertension. The adrenal glands sit right on top of the kidneys. Both of these tumors produce excessive amounts of adrenal hormones that cause high blood pressure. These tumors can be diagnosed from blood tests, urine tests, and imaging studies of the adrenal glands. Surgery is often required to remove these tumors or the adrenal gland (adrenalectomy), which usually relieves the hypertension.

One of the types of adrenal tumors causes a condition that is called primary hyperaldosteronism because the tumor produces excessive amounts of the hormone aldosterone. In addition to the hypertension, this condition causes the loss of excessive amounts of potassium from the body into the urine, which results in a low level of potassium in the blood. Hyperaldosteronism is generally first suspected in a person with hypertension when low potassium is also found in the blood.

(Also, certain rare genetic disorders affecting the hormones of the adrenal gland can cause secondary hypertension). The other type of adrenal tumor that can cause secondary hypertension is called apheochromocytoma. This tumor produces excessive catecholamines, which include several adrenaline-related hormones. The diagnosis of a pheochromocytoma is suspected in individuals who have sudden and recurrent episodes of hypertension that are associated with flushing of the skin, rapid heart beating (palpitations), and sweating, in addition to the symptoms associated with high blood pressure [10, 15].

Coarctation of the Aorta: Coarctation of the aorta is a rare hereditary disorder that is one of the most common causes of hypertension in children. This condition is characterized by a narrowing of a segment of the aorta, the main large artery coming from the heart. The aorta delivers blood to the arteries that supply all of the body's organs, including the kidneys. The narrowed segment (coarctation) of the aorta generally occurs above the renal arteries, which causes a reduced blood flow to the kidneys. This lack of blood to the kidneys prompts the rennin-angiotensin-aldosterone hormonal system to elevate the blood pressure. Treatment of the coarctation is usually the surgical correction of the narrowed segment of the aorta. Sometimes, balloon angioplasty (as described above for renal artery stenosis) can be used to widen (dilate) the coarctation of the aorta.

The Metabolic Syndrome and Obesity: Genetic factors play a role in the constellation of findings that make up the "metabolic syndrome." Individuals with the metabolic syndrome have insulin resistance and a tendency to have type 2 diabetes mellitus (non- insulin- dependent diabetes). Obesity, especially associated with a marked increase in abdominal girth, leads to high blood sugar (hyperglycemia), elevated blood lipids (fats), vascular inflammation, endothelial dysfunction (abnormal reactivity of the blood vessels), and hypertension all leading to premature atherosclerotic vascular disease. The *American Obesity Association* states the risk of developing hypertension is five to six times greater in obese Americans, age 20 to 45, compared to non-obese individuals of the same age. The American Journal of Clinical Nutrition reported in 2005 that waist size was a better predictor of a person's blood pressure than body mass index (BMI). Men should strive for a waist size of 35 inches or under and women 33 inches or under. The epidemic of obesity in the United States contributes to hypertension in children, adolescents, and adults.

Symptoms of High Blood Pressure: Uncomplicated high blood pressure usually occurs without any symptoms (silently) and so hypertension has been labeled "the silent killer." It is called this because the disease can progress to finally develop any one or more of the several potentially fatal complications of hypertension such as heart attacks or strokes. Uncomplicated hypertension may be present and remain unnoticed for many years, or even decades. This happens when there are no symptoms, and those affected fail to undergo periodic blood pressure screening. Some people with uncomplicated hypertension, however, may experience symptoms such as headache, dizziness, shortness of breath, and blurred vision. The presence of symptoms can be a good thing in that they can prompt people to consult a doctor for treatment and make them more compliant in taking their medications. Often, however, a person's first contact with a physician may be after significant damage to the end-organs has occurred. In

many cases, a person visits or is brought to the doctor or an emergency room with a heart attack, stroke, kidney failure, or impaired vision (due to damage to the back part of the retina). Greater public awareness and frequent blood pressure screening may help to identify patients with undiagnosed high blood pressure before significant complications have developed. About one out of every 100 (1%) people with hypertension is diagnosed with severe high blood pressure (accelerated or malignant hypertension) at their first visit to the doctor. In these patients, the diastolic blood pressure (the minimum pressure) exceeds 140 mm Hg. Affected persons often experience severe headache, nausea, visual symptoms, dizziness, and sometimes kidney failure. Malignant hypertension is a medical emergency and requires urgent treatment to prevent a stroke (brain damage) [12, 16, 17].

ANTIHYPERTENSIVE DRUGS AND ITS ADVERSE EFFECTS

BRAND NAME (GENERIC NAME)	POSSIBLE COMMON SIDE EFFECTS INCLUDE:
Accupril (quinapril hydrochloride)	Headache, dizziness
Aldatazide	Diarrhea, fever, headache, decreased coordination
Aldactone (spironolactone)	Cramps, drowsiness, stomach disorders
Aldomet (methyldopa)	Fluid retention, headache, weak feeling
Altace (ramipril)	Headache, cough
Calan, Calan SR (verapamil hydrochloride)	Constipation, fatigue, decreased blood pressure
Capoten (captopril)	Decreased sense of taste, decreased blood pressure tiching, rash
Cardene (nicardipine Hydrochloride)	Dizziness, headache, indigestion and nausea, increased heartbeat
Cardizem (diltiazem hydrochloride)	Dizziness, fluid retention, headache, nausea, skin rash
Cardura (doxazosin mesylate)	Dizziness, fatigue, drowsiness, headache
Catapres	Dry mouth, drowsiness, dizziness, constipation
Corgard (nadolol)	Behaviorial changes, dizziness, decreased heartbeat, tiredness
Corzide	Dizziness, decreased heartbeat, fatigue, cold hands and feet
Diuril (chlorothiazide)	Cramps, constipation or diarrhea, dizziness, fever, increased glocose level in urine
Dyazide	Blurred vision, muscle and abdominal pain, fatigue
DynaCirc (isradipine)	Chest pain, fluid retention, headache, fatigue
HydroDIURIL (hydrochlorothiazide)	Upset stomach, headache, cramps, loss of appetite
Hygroton (chlorthalidone)	Anemia, constipation or diarrhea, cramps, itching
Hytrin (terazosin hydrochloride)	Dizziness, labored breathing, nausea, swelling
Inderal (propranolol hydrochloride)	Constipation or diarrhea, tingling sensation, nausea and vomiting
Inderide	Blurred vision, cramps, fatigue, loss of appetite

BRAND NAME (GENERIC NAME)	POSSIBLE COMMON SIDE EFFECTS INCLUDE:
Lasix (furosemide)	Back and muscle pain, indigestion, nausea
Lopressor (metoprolol tartrate)	Diarrhea, itching/rash, tiredness
Lotensin (benazepril hydrochloride)	Nausea, dizziness, fatigue, headache
Alozol (indapamide)	Anxiety, headache, loss of energy, muscle cramps
Maxzide	Cramps, labored breathing, drowsiness, irritated stomach
Minipress (prazosin hdrochloride)	Headache, nausea, weakness, dizziness
Moduretic	Diarrhea, fatigue, itching, loss of appetite
Monopril (fosinopril sodium)	Nausea and vomiting, headache, cough
Normodyne (labetalol hydrochloride)	Fatigue, nausea, stuffy nose
Plendil (felodipine)	Pain in back, chest, muscles, joints, and abdomen, itching, dry mouth, respiratory problems
Procardia, Procardia X (nifedipine)	Swelling, constipation, decreased blood pressure, nausea, fatigue
Sectral (acebutolol hydrochloride)	Constipation or diarrhea, gas, chest and joint pain
Ser-Ap-Es	Blurred vision, cramps, muscle pain, dizziness
Tenex (guanfacine hydrochloride)	Headache, constipation, dry mouth, weakness
Tenoretic	Decreased heartbeat, fatigue, nausea
Tenormin (atenolol)	Nausea, fatigue, dizziness
Veseretic	Diarrhea, muscle cramps, rash
Vasotec (enalapril maleate)	Chest pain, blurred vision, constipation or diarrhea, hives, nausea
Visken (pindolol)	Muscle cramps, labored breathing, nausea, fluid retention
Wytensin (guanabenz acetate)	Headache, drowsiness, dizziness
Zaroxolyn (metolazone)	Constipation or diarrhea, chest pain, spasms, nausea
Zestoretic (lisinopril hydrochlorothiazide)	Fatigue, headache, dizziness
Zestril (lisinopril)	Labored breathing, abdominal and chest pain, nausea, decreased blood pressure

Pregnancy- Induced Hypertension (PIH): Pregnancy is a joyful time for most mothers: it can be exciting, fun, and gives you lots to look forward to. But pregnancy also comes with a lot of responsibility, including frequent visits to your health care practitioner. Now that you are pregnant you have probably noticed that your health care providers are frequently checking your blood pressure. Blood pressure must be monitored during pregnancy because of a condition called pregnancy- induced hypertension. If you are pregnant, be sure that you get your blood pressure levels checked out frequently to avoid developing this condition.

Pregnancy-induced hypertension is a condition that causes elevated blood pressure in a mother-to-be. In order to be diagnosed with pregnancy-induced hypertension, your blood pressure levels must be higher than 140/90 mmHg during the last half of your pregnancy. Pregnancy-induced hypertension can be quite serious as it can lead to various complications both for you and your baby. In fact, preeclampsia and eclampsia, severe forms of pregnancy-induced hypertension, are the leading cause of infant and maternal death in the United States.Also called toxemia and gestational hypertension, pregnancy-induced hypertension is found in about 5% to 10% of all pregnancies in the United States. It is the most common medical problem associated with pregnancy but there is no known cause or cure for the condition. However, there are specific symptoms of hypertension in pregnancy. If you notice these hypertension symptoms, speak with your health care provider immediately.

Causes of Pregnancy- Induced Hypertension: To date, there is no known cause for pregnancy-induced hypertension. It is thought that the condition may begin in early pregnancy, during embryo implantation. Generally, blood vessels in the uterus stay relaxed during implantation and pregnancy. People with pregnancy-induced hypertension appear to have abnormally constricted blood vessels but often have no history of heart disease. This could be the cause of hypertension.

Types of Pregnancy- Induced Hypertension: There are three main types of pregnancy-induced hypertension:

1. **Gestational Hypertension:** Gestational hypertension is the most common form of hypertension in pregnancy. It is diagnosed if a woman's blood pressure is higher than 140/90 in the last half of her pregnancy. No other signs or symptoms accompany this type of hypertension.

2. **Preeclampsia:** Preeclampsia is a more serious form of pregnancy-induced hypertension. It is diagnosed when a mother's blood pressure is higher than 140/90 in the last 20 weeks of pregnancy, and when protein is found in urine samples.

3. **Eclampsia:** Eclampsia is one of the most serious forms of pregnancy-induced hypertension. It causes convulsions or coma in the late stages of pregnancies.

Symptoms of Pregnancy- Induced Hypertension: All expectant mothers should be aware of pregnancy-induced hypertension symptoms. These include:

- blood pressure readings above 140/90, or significantly higher than normal
- protein found in the urine (caused by damaged kidney filter)
- edema (swelling), especially in the face and neck
- sudden weight gain
- blurred or double vision
- headache
- seeing flashing lights or spots
- urinating only small amounts
- abdominal pain
- nausea and dizziness

Complications Associated with Pregnancy-Induced Hypertension: Pregnancy- induced hypertension can be very dangerous for both you and your baby. If left untreated, it can easily worsen, leading to severe preeclampsia or

eclampsia. Effects of pregnancy-related hypertensions include:

- leaky blood vessels, leading to swelling and weight gain
- leaky vessels in the lungs, causing shortness of breath
- leaking liver vessels, causing swelling and liver damage
- protein leaks in the kidneys, which can lead to low birth weight babies

Typically, these complications will disappear after your baby is born, however, damage to the organs can still result. Some of the most serious complications of pregnancy-induced hypertension include:

- blindness, liver rupture, and kidney failure in the mother
- placental abruption, in which the placenta separates from the uterus possibly resulting in stillbirth
- brain damage to mom, caused by swelling, convulsions, and coma
- HELLP syndrome, which can destroy the body's red blood cells, liver, and stops the blood from clotting

Treatment: There is no known cure for pregnancy-induced hypertension. Some doctors will prescribe micardis, a drug which can help decrease hypertension. If hypertension occurs late in your pregnancy, your health care provider may suggest bed rest and increased blood pressure monitoring. Certain hypertension medications may also be prescribed. Usually, delivery is the best treatment for pregnancy-induced hypertension. Once your baby is born, symptoms of the condition disappear. Labor may be induced or a c- section performed. If hypertension occurs early in pregnancy you health care provider will suggest that you weigh the risks and benefits of carrying to term or having an early cesarean section. Malignant hypertension is a rare but very serious form of high blood pressure. Officially, malignant hypertension is defined as severe hypertension that occurs along with internal bleeding of the retinas in both eyes and swelling of optic nerves behind the retinas. Malignant hypertension must be treated quickly to avoid serious organ damage and, possibly, death. All the major organ systems are at risk from the severe blood pressure elevations present in malignant hypertension, but the kidneys, eyes, and brain seem to be most at risk. The kidneys are especially sensitive to increases in blood pressure and permanent kidney damage is a common complication of untreated malignant hypertension. Most of this organ damage is caused by ruptures in small blood vessels in places, which is why retinal bleeding (which has small blood vessels) is included in the diagnostic criteria for malignant hypertension.

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damage is caused by ruptures in small blood vessels in places, which is why retinal bleeding (which has small blood vessels) is included in the diagnostic criteria for malignant hypertension.

Causes of Malignant Hypertension: Like high blood pressure in general, the exact cause of malignant hypertension is not completely understood. The details of how malignant hypertension starts have been an important research topic for many years, and while the complete picture is still emerging, we do know a few important things:

- Younger patients are at higher risk than older patients, which is the opposite of the risk profile for essential hypertension
- Those of African heritage are at higher risk
- Anyone with a history of kidney failure or a disease called renal artery stenosis (narrowing of arteries in the kidney) has a greatly increased risk
- Pregnant women with gestational hypertension, or women experiencing certain pregnancy related complications (toxemia of pregnancy) appear to have an increased risk

Overall, malignant hypertension is very rare, affecting only about one percent of people with high blood pressure. The serious nature of the disease, however, makes it an important problem.

Symptoms of Malignant Hypertension: Because malignant hypertension affects organ systems that are directly sensitive to blood pressure (kidneys, eyes, brain, cardiovascular system), the symptoms of the disease tend to be those you would associate with problems in these other organ systems. For example, some symptoms include:

- Blurry vision
- Chest pain
- Seizure
- Decreased urine output
- Weakness or strange tingling/numbness in the arms, legs, or face
- Headache
- Shortness of breath

These symptoms are not exclusive to malignant hypertension, but are generally associated with a number of potentially serious medical conditions like heart attack, stroke, or kidney problems. If you have any of these symptoms, you should seek medical care immediately.

Malignant Hypertension Treatment: People with malignant hypertension should always be admitted to the hospital for close observation and treatment. Depending on how serious the problem is in a particular patient, admission to the Intensive Care Unit (ICU) may be required. During the hospital stay, intravenous medications are the main focus of therapy. Some drugs commonly used to reduce blood pressure in this situation are nitroprusside and nitroglycerin. A number of blood tests will also be checked, probably several times, to assess the status of the kidneys and other organs. Sometimes, more complicated tests may be required, and pictures of the heart or other organs may be taken using an echo machine or an ultrasound machine. If treated quickly, malignant hypertension has a good prognosis. After leaving the hospital, it is common for patients prescribed medicines like beta blockers or ACE inhibitors to keep the blood pressure under control in the future [12, 13, 15].

CONCLUSION: Hypertension is one of the most common worldwide diseases afflicting humans. Because of the associated morbidity and

mortality and the cost to society, hypertension is an important public health challenge. Over the past several decades, extensive research, widespread patient education, and a concerted effort on the part of health care professionals have led to decreased mortality and morbidity rates from the multiple organ damage arising from years of untreated hypertension. Hypertension is the most important modifiable risk factor for coronary heart disease (the leading cause of death in North America), stroke (the third leading cause), congestive heart failure, end-stage renal disease, and peripheral vascular disease. Therefore, health care professionals must not only identify and treat patients with hypertension but also promote a healthy lifestyle and preventive strategies to decrease the prevalence of hypertension in the general population.

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