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HIGH BLOOD PRESSURE-A SILENT KILLER

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ABSTRACT

The term high blood pressure is very familiar to both educated and uneducated people in today's scenario, however the understanding of the term came from the work of physician William Harvey (1578-1657) who described the circulation of blood in "De motu cordis". It is one of the most common problem that is faced globally by the people of different ages irrespective of gender differences. Some people with high blood pressure ignore the problem or think it can't hurt them. Blood pressure has two measurements. The first, called systolic pressure, is the pressure of the blood against an artery when the heart muscle contracts. The second measurement, called diastolic pressure, is pressure of the blood against the artery when heart muscle is relaxing. Hypertension accounts as a major public health challenge not only in India but on Global level. It is one of the most common cardiovascular risk factor because many people do not know they have it and can't get proper treatment.

KEY WORDS: High blood pressure, systolic pressure, diastolic pressure.

INTRODUCTION

Blood Pressure is the force exerted by the flow of blood on major arterial blood vessels. A condition called high blood pressure/hypertension, occurs when this force is too high. A person with blood pressure reading of 140/90 mmHg or higher is said to have condition called 'High Blood Pressure'. The term was coined by Eberhard Frank in 1911 as "Essentielle Hypertonie"[1] for which no cause was found. It is measured by the amount of blood being pumped by heart in a minute. Worldwide, elevated blood pressure (BP) is the leading cause of death, even exceeding deaths attributable to smoking and elevated cholesterol level.[2] This throws light on the fact that blood pressure is a strong, consistent,

continuous, independent, and etiologically relevant risk factor for cardiovascular disease-renal disease[3] In year 2000, nearly one billion people or ~26% of the adult population of the world had hypertension.[4] of which about 333 million people in developed and 639 million people in undeveloped countries were suffering from hypertension. However, it varies markedly in different regions with rates as low as 3.4% (men) and 6.8% (women) in rural India and as high as 68.9% (men) and 72.5% (women) in Poland.[5] High blood pressure usually causes no symptoms until complications develop, therefore it is known as 'Silent killer'. It is one of the most common problem faced by both men and women, as who is more susceptible to this? The question still remains unanswered, but researches are still going on. Almost half of the people suffering from high blood pressure are not aware of it as there is no preliminary symptom .World Hypertension League, (WHL), an umbrella organisation of 85 national hypertension societies and leagues, recognised that more than 50% of hypersensitive population worldwide are unaware of their health condition.[6]

SYMPTOMS OF HIGH BLOOD PRESSURE

When blood pressure remains high for long time, it causes serious effects on various parts of the body .Some common symptoms of high blood pressure are.

Kidney disease

Due to suge in blood pressure, blood vessels get narrow in the kidneys as a result of which kidneys have to struggle more to remove extra fluid from body resulting in kidney failure.

Damage to eyes

Continuous hypertension results in burst or bleed in eyes, damaging the eyes and in extreme cases it can result in blindness.

Heart attack

It occurs when there is blockage of oxygen-rich blood to a section of heart muscle due to which heart is not able to get enough oxygen, resulting in heart attack, chest pain, discomfort and shortness of breath. This condition is pronounced as ‘heart attack’.

Heart failure

When the heart can’t pump enough blood to meet the body’s needs. Failure of heart occurs. Symptoms of heart failure corresponds to shortness of breath, swelling of ankles, feet, legs, abdomen, and veins in the neck.

Peripheral artery disease

This is a disease in which plaque builds up in leg arteries and affects blood flow in the legs. Warning symptoms are pain, cramping, numbness, aching, or heaviness in the legs, feet, and buttocks.

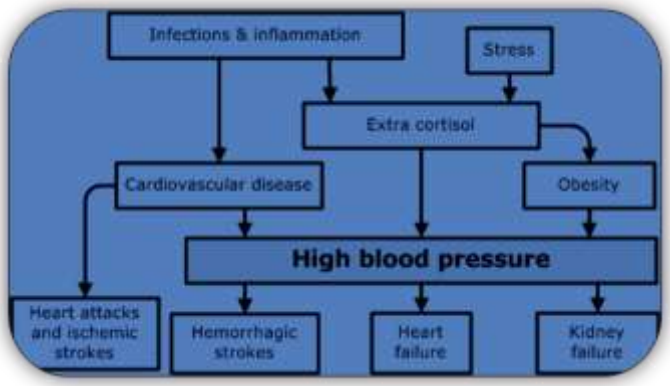

Fig 1: High Blood Pressure and associated risks factors

Cognitive disorders

High blood pressure if not monitored regularly can result in condition like, memory loss etc.

Brain stroke

It occurs when flow of oxygen-rich blood to a portion of the brain is blocked. The symptoms of a stroke include weakness, paralysis or numbness of the face, arms, legs and trouble in speaking.

Aneurysm

It is a condition in which there is observed bulge in the wall of arteries which grows large enough and press nearby body parts, or block blood flow and turn out in a severe condition thereby damaging that part.

CAUSES OF HIGH BLOOD PRESSURE

- Obesity / overweight
- Less physical activity
- Smoking /alcohol
- Alcohol consumption
- High Salt Intake
- High Fat diet
- Age

- Ethnic origin
- Family history

DIAGNOSING AND MONITORING HIGH BLOOD PRESSURE

Doctor can diagnose the high blood pressure by simply using a Sphygmomanometer/ digital blood pressure monitor. This monitor records the systolic blood pressure (SBP), the top number, and diastolic blood pressure (DBP), the bottom number. Although there are tests which are done for additional problems associated with Hypertension such as urine and blood test, ECG (electrocardiogram), Echo cardiogram, examination of eyes. There are following types of high blood pressure.

- Pre hypertension: 120/80 mmHg or higher
- Stage 1 high blood pressure: 140/90 mmHg or higher
- Stage 2 high blood pressure: 160/100 mmHg or higher
- Hypertensive crisis (a life-threatening condition): 180/110 mmHg or higher

MALE AND HIGH BLOOD PRESSURE

The factors that contribute for the rise in high blood pressure in men include obesity, less physical activity, high salt intake, excessive alcohol consumption. Other than this metabolic syndrome (abdominal obesity) is also associated to heart diseases and diabetes in case of men.

FEMALE AND HIGH BLOOD PRESSURE

Some research findings have shown that women tend to have higher heart pump output and lower blood vessel resistance, and this minimises blood vessel injury which is probably counted as one of the reasons, why women remain protected from hypertension. While some other researches give the credit to oestrogen, a female sex hormone it is still a topic of research and many more evidences are to be collected until it is proven. After menopause as the level of estrogen starts dropping, with the increase in age inclination in blood pressure is likely to happen. In addition, contraceptive pills may further add up to woman's high blood pressure risk. Thus, women taking pill should have their blood pressure checked regularly. Similar to men, obesity, physical inactivity, excessive alcohol intake and a high salt diet increase the risk of high blood pressure in women. Studies have shown that high blood pressure is common in up to 15% of all pregnant ladies.

HOW TO CONTROL HIGH BLOOD PRESSURE

Maintenance of healthy weight-The body mass (BMI) is a common measurement for the weight and height ratio. The BMI is defined as the body mass divided by the square of the body height, and is expressed in units of kg/m^2. Thus it is important to maintain proper weight. The present (table1) helps in knowing the healthy weight. Calculate the BMI by using the following formula.

BMI: Body Weight (kg) / [Height (m)]2

Table1: Showing Body Mass Index

Category	BMI range –Kg/m^2BMI	
Very severely underweight	Less than 15	Less than 0.60
Severely underweight	15.0 to 16.0	0.60 to 0.64
Underweight	16.0 to 18.5	0.64 to 0.74
Normal healthy weight	1.85 to 25	0.74 to 1.0
Overweight	25 to 30	1.0 to 1.2
Moderately obese	30 to 35	1.2 to 1.4
Severely obese	35 to 40	1.4 to 1.6
Very severely obese	35 to 40	1.4 to 1.6

Reduction of daily salt intake

Excessive use of sodium in diet contributes to high blood pressure cases. So it is recommended to take low sodium probably 2,000 mg about a teaspoon of salt daily. It is better to avoid food that carry high salt quantity.

Switch to healthy diet

High cholesterol leads to the hardening and stiffness in arteries. So it is good to avoid food rich in high cholesterol and saturated fats particularly food items like fat meats, full cream milk, egg yolks, internal organs, and deep fried foods should be avoided by patients of hypertension.

Avoid sedentary life style

People with sedentary lifestyles are likely to become overweight and this is one of the factors that increases the risk of high blood pressure. Adequate amount of exercise, fitness regime, walking, playing, even spending time with pet can help to overcome the sedentary life style.

Cut down on alcohol and smoke less

Alcohol increases the blood pressure. So it is recommended to consume less alcohol in patients having high blood pressure.

Monitor blood pressure regularly

If a person is diagnosed with high blood pressure, digital blood pressure monitor can be easily used at home as well as it can be carried to work place. Measure your blood pressure regularly.

Minimize stress-Stress is one of the major cause of high blood pressure. Meditation can help to maintain healthy blood pressure as it relaxes the body. Even practising it for 15 to 30 minutes can bring positive results. Relaxation techniques such as listening to music, practising yoga can also be followed.

Fig 2: A digital blood pressure meter

FOLLOW HEALTY DIET PLAN

DASH which stands for "Dietary Approaches to Stop Hypertension. A healthy eating plan which reduces the risk of developing high blood pressure and lowers the blood pressure that is already too high. For an overall eating plan, consider DASH,[7] "It is based on 2,000 calories a day serving sizes should be increased or decreased depending on calorie levels of person. It has an emphasis on real foods, fruits and vegetables, balanced with the right amount of protein. DASH is the perfect weight loss solution program as it is healthy and can be followed for whole life. This diet plan can easily be followed by every member of the family .It is beneficial for people who has the tendency to carry excess weight around the middle, or who have metabolic syndrome, or postmenopausal weight gain and, it has been effective in lowering blood pressure and cholesterol.

Table 2: DASH recommended diet plan

FOOD GROUP	DAILY SERVINGS	SERVING SIZE
Grains and grain products	7-8	1 slice bread 1 cup ready-to-eat cereal* 1/2 cup cooked rice, pasta, or cereal
Vegetables	4-5	1 cup raw leafy vegetable 1/2 cup cooked vegetable 6 ounces vegetable juice
Fruits	4-5	1 medium fruit 1/4 cup dried fruit 1/2 cup fresh, frozen, or canned fruit 6 ounces fruit juice
Low fat or fat free dairy foods	2-3	8 ounces milk 1 cup yogurt 1 1/2 ounces cheese
Lean meats, poultry, and fish	2 or fewer	3 ounces cooked lean meat, skinless poultry, or fish
Nuts, seeds, and dry beans	4-5 /week	1/3 cup or 1 1/2 ounces nuts 1 tablespoon or 1/2 ounce seeds 1/2 cup cooked dry beans
Fats and oils**	2-3	teaspoon soft margarine 1 tablespoon low fat mayonnaise 2 tablespoons light salad dressing 1 teaspoon vegetable oil
Sweets	5 /week	1 tablespoon sugar 1 tablespoon jelly or jam 1/2 ounce jelly beans 8 ounces lemonade

* Serving sizes vary between 1/2 cup and 1 1/4 cups. Check the product's nutrition label.

** Fat content changes serving counts for fats and oils: For example, 1 tablespoon of regular salad dressing equals 1 serving, 1 tablespoon of low fat salad dressing equals 1/2 serving, and 1 tablespoon of fat free salad dressing equals 0 servings.

SOME FOOD ITEMS RECOMMENDED IN HIGH BLOOD PRESSURE

Garlic

It is a medicinal, herb which is recommended in hypertension as it has an active substance known as garlic sulphides and allicin. Allicin helps in relaxing blood vessels interfering with the effects of angiotensin I enzyme which reduces elevated blood pressure and smoothly contracts the muscles. A part from its cholesterol lowering properties, people can also benefit from it because of its effectiveness in improving a person's digestion and immune system. It has an ability to break down fibrinolytic activity in a person's blood and platelet aggregation. Another reason why garlic has been getting popularity in preventing high blood

pressure is due to its ability to stimulate hydrogen sulphide and nitric oxide synthase production.

Vitamin C

Vitamin C has been proved as a natural diuretic that helps blood vessel walls to relax and lower blood pressure.

Potassium

According to Appel[8] "Higher levels of potassium blunt the effects of sodium. If you are unable to reduce sodium, taking potassium may help. But doing both is even better." Indeed, maintaining a proper potassium to sodium ratio in the diet is very important. Eating salt raises the amount of sodium in your blood stream and wrecks the delicate balance, which reduces the ability of kidneys to remove the water. Potassium is a chemical which helps to lower blood pressure by balancing out the negative effects of salt. By eating more fruit and vegetables rich in potassium, will not only increase the potassium level but also help in restoring the delicate balance. This will in turn help the kidneys to work more efficiently and help to restore the blood pressure to a healthy level.

Magnesium

Adequate amount of magnesium in diet helps in the production of prostaglandin E1, readily available in foods, such as peas, beans, whole grains, nuts, seeds, squash, broccoli, spinach, and seafood is a powerful vasodilator . It is also seen that Sodium and potassium work in combination to maintain normal blood pressure levels .A vasodilator causes the blood vessels to relax which allows easier blood flow and hence by lowering the high blood pressure.

Spirulina

Spirulina is an alga rich in, protein, vitamin E, zinc and iron, carotenoids, antioxidants that destroys free radicals in the body. It has the unique ability to boost nitric oxide levels and providing relief to hypertension patients. It is available in form as tablets, pills and powder. A part from this consult the health care provider before taking any Spirulina.

Fiber

Dietary fiber consists of indigestible components of food from plants. Evidence from observational studies and several trials suggests that increased fiber intake may reduce

hypertension.[9] Consuming food rich in salad, green leafy vegetables, not only help to control hypertension but also helps to reduce weight.

Egg white protein

According to one of the latest research conducted by Yu and Collegues (2013) of Clemson University they found out that egg white peptides, could serve as a adjunct to high blood pressure medication.[10] In their research finding they used egg white (Peptide) which works as angiotensin-converting enzyme (ACE) inhibitor and has a powerful ability to block action of ACE, a substance responsible for high blood pressure.

MEDICATION

ACE inhibitors

Angiotensin-converting enzyme (ACE) inhibitors reduce blood pressure by relaxing the blood vessels.

Calcium channel blocker

Calcium channel blockers keep a check on calcium from entering the muscle cells of the heart and blood vessels too. They help in widening of arteries (large blood vessels) and reduces the risk high blood pressure.

Diuretics/water pills

This works by flushing excess water and salt from the body through urine.

Beta-blockers

Beta-blockers work by making your heart beat more slowly and with less force, thereby reducing blood pressure.

Alpha-blockers

These reduce nerve impulses to blood vessels, allowing blood to pass more easily.

Nervous system inhibitors

These relax blood vessels by controlling nerve impulses.

Alpha- beta blockers

These work the same way as alpha-blockers but also slow the heartbeat, as beta-blockers do.

Vasodilators

These directly open blood vessels by relaxing the muscle in the vessel walls.

Note – it is always advised to consult the doctor before taking any medication.

CONCLUSION

Hypertension is a emerging as a huge problem and its prevention efforts are essential. The common key factors that are responsible for hypertension are sedentary habits and diet, increase in weight, measured as body mass index and increase waist size. Due to changing lifestyle people become more sedentary and their diet mostly comprises of saturated fat, trans fatty acids and salt, with less fruits and vegetables. Irrespective of any age and gender differences this is emerging as serious disease because people do not monitor it regularly. As it is not only one health problem but a bundle of health issues which are associated with it. Once a person is diagnosed with hypertension, proper medication along with healthy diet and better health regime should be followed .Untreated high blood pressure can double the risk of stroke, heart attack, and increases risk of other cardiovascular disorders. Ultimately, people select the types and volume of food they eat and the amount of physical activity they perform. Still, as noted by the policy-making bodies, the environment factors such as cultural forces, societal norms, and commercial interests again depending on the country, community etc has a powerful influence on whether people consume excess calories, follow a healthy diet, and are physically active**.** WHO has identified, hypertension, as the leading cause of cardiovascular mortality in the world.

REFERENCES

1. Paul I Korner, Essential Hypertension and its causdes: Neural and Non neural mechanisms, Oxford University press USA .2007;4. ISBN978-0-19-5357740-0.
2. Lopez AD, Mathers CD, Ezzati M, et al.,Global and regional burden of disease and risk factors:2001: Systematic analysis of population health data. Lancet, 2006; 367: 1747–1757.
3. Chobanian AV, Bakris GL, Black HR, et al., Seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure. Hypertension, 2003; 42: 1206–1252.
4. Muntner P, Whelton PK, He J; Whelton; Reynolds; Muntner; Whelton; He "Global burden of hypertension: analysis of worldwide data" Lancelet, 2005; 365(9455): 217–23.

5. Kearney PM, Whelton M, Reynolds K, Whelton PK, He J; Whelton; Reynolds; Whelton; He. "Worldwide prevalence of hypertension: a systematic review". J. Hypertens, January 2004; 22(1); 11–9.
6. Medline plus com .Medline plus : High Blood Pressure.www.nlm.nih.gov/ medline /high blood pressure .html
7. Dietary Guidelines Advisory Committee Report of the Dietary Guidelines Advisory Committee on the Dietary Guidelines for Americans. Springfield, VA, 2005: US Department of Agriculture, Agricultural Research Service.
8. Appel LJ, Espeland MA, Easter L, et al., Effects of reduced sodium intake on hypertension control in older individuals: Results from the trial of non pharmacologic interventions in the elderly (TONE). Arch Intern Med, 2001; 161: 685–693.
9. Whelton S.P, Hyre A.D, Pedersen B, et al., Effect of dietary fiber intake on blood pressure: A meta-analysis of randomized, controlled clinical trials. J Hypertens, 2005; 23: 475–481.
10. www.clemson.edu.