WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 7.523
Volume 7, Issue 3, 1729-1738. Review Article ISSN 2277– 7105

DIET AND LIFESTYLE MODIFICATION IN HYPERTENSION

[1]Dr. Darishisha L. Suting, [2]Dr. Vivek Singh, [3]*Dr. Vijay Kumar and [4]Prof. (Dr.) P. K. Goswami

[1]Lecturer, Department of Swasthavritta and Yoga, NEIAH, Shillong.

[2]Lecturer, Dept. of Samhita & Sidhant, NEIAH, Shillong.

[3]Associate Professor, Department of Swasthavritta and Yoga, NEIAH, Shillong.

[4]Director. NEIAH, Shillong.

Article Received on
20 Dec. 2017,

Revised on 10 Jan. 2018,
Accepted on 30 Jan. 2018

DOI: 10.20959/wjpr20183-11059

***Corresponding Author**
Dr. Vijay Kumar
Associate Professor,
Department of Swasthavritta and Yoga, NEIAH, Shillong.

ABSTRACT

Hypertension is a term used to indicate high blood pressure. It is a condition characterized by an increase in the arterial pressure of an individual. It is the most common cardiovascular disease all over the world. The higher the blood pressure is, the higher is the risk of complications like stroke, myocardial infarction and renal failure. Blood pressure is the measurement of the force exerted by blood on the arterial walls as the heart pumps blood. Hypertension is a global issue. In India, it is estimated to range from 4 to 8 percent and the trend is increasing due to changes in lifestyle. A report has indicated that nearly 1 billion adults globally or worldwide had hypertension in 2000 and this is predicted to increase to 1.56 billion by 2025. India is labelled as a global capital of hypertension. Hypertension results from a variety of reasons like stress, obesity, genetic factors, excessive intake of salt in the diet and ageing. The principal focus of Ayurveda is on maintaining good health and adopting a healthy way of living. This article is an effort to prevent and control hypertension with modifications in the diet and lifestyle of an individual.

KEYWORDS: Hypertension, high blood pressure, diet, lifestyle, physical activity, cardiovascular disease.

INTRODUCTION

Hypertension is an important worldwide public health challenge and remains a major cause of morbidity and mortality worldwide.[1] Nearly 1 billion adults globally had hypertension in 2000 and this is predicted to increase to 1.56 billion by 2025.[2] Hypertension is a major risk

factor for myocardial infarction (heart attacks), stroke, aneurysms of the arteries, peripheral arterial disease and coronary heart disease and is a major contributor to the onset and progression of chronic heart failure, chronic kidney failure and retinopathies.[3] The World Health Organisation (WHO) has identified India as one of the nation that is going to have most of the lifestyle disorders in the near future. Hypertension is called as the silent killer because it rarely exhibits symptoms before it damages the heart, brain or kidney.[4]

Diet and lifestyle modification is indicated for all patients with hypertension, regardless of drug therapy, because it may reduce or even abolish the need for hypertensive drugs. In addition to the immediate goal of lowering blood pressure, the recommended diet and lifestyle changes confer a range of health benefits, including better outcomes of common chronic diseases. Therefore, this article is aimed at preventing and controlling hypertension by modifying the diet and lifestyle habits.

AIMS AND OBJECTIVES

The goal of hypertension treatment is to lower high blood pressure. To prevent and control hypertension, an individual should be encouraged to make lifestyle modifications, such as eating a healthier diet, quitting smoking, and getting more exercise.

MATERIAL AND METHODS

To study the diet and lifestyle modifications or changes that helps in preventing and controlling hypertension, classical books on Ayurveda, modern literature, available research updates and scientific information available on internet, etc were searched and analysed.

REVIEW OF LITERATURE

Hypertension

The tension exerted on the wall of arteries by the contraction of the heart is called as “Blood Pressure”.[5] In adults, hypertension is a condition in which the blood pressure is higher than 140 mmHg of systolic or 90 mmHg of diastolic on three separate readings recorded several weeks apart.[6]

Classification of Blood Pressure (WHO).[7]

Category	Systolic (mmHg)	Diastolic (mmHg)
Normal	< 130	< 85
High Normal	130-140	85-90
Hypertension		
Mild (Stage 1)	140-159	90-99
Moderate (Stage 2)	160-179	100-109
Severe (Stage 3)	> 180	> 110

Blood Pressure readings are usually given as two numbers. For example, 120 over 80 (written as 120/80 mmHg). The top number represents the systolic blood pressure and the bottom number represents the diastolic blood pressure. The heart contracts with each beat followed by constriction of arteries and raise in blood pressure, thereafter the heart relaxes between two beats. Systolic blood pressure measures the pressure when the heart contracts and diastolic blood pressure measures pressure when the heart relaxes between two consecutive heart beats. Blood pressure is measured by an instrument known as sphygmomanometer.

Hypertension is a pathological condition in which either systolic or diastolic or both are increased. When an individual's blood pressure is ≥ 140/90 mmHg, he/she is said to have high blood pressure or hypertension. If the blood pressure is ≥ 120/80 mmHg but less than 140/90 mmHg, the condition is called as high normal blood pressure or pre-hypertension. Prehypertension make susceptible a person to develop high blood pressure. In certain cases, blood pressure values can be lower than the normal values and the condition is called as low blood pressure or hypotension.

Causes

In most cases, there is no known cause for hypertension and this is known as Essential hypertension. Hypertension can be a result of another medical condition or some medications and this is known as secondary hypertension, which can be due to chronic renal disease, disorders of the adrenal gland such as Cushing's syndrome, pre-eclampsia in pregnancy and hyperparathyroidism. Hereditary and advanced age play a role in increasing the risk of hypertension. High intake of sodium increases the risk of high blood pressure. Low intake of magnesium, calcium and potassium may alter the ratio of sodium to these minerals and increase the risk of hypertension. Frequent intake of cola beverages and alcohol also aggravates the problem. Stress increases the risk of hypertension.

There are many physical, psychological and environmental stresses which contribute to the risk of high blood pressure.

1. Physical stress: can be due to overwork, intense exercise beyond the capacity of the body for a long period.
2. Psychological stress: may include emotional issues lingering over a period of time.
3. Environmental stress: environmental factors might be related to the side effects of medicines, financial issues, surroundings, lack of movements, etc.

Overweight, obesity and diabetes and their associated disorders are often associated with hypertension. With the prevalence of obesity in younger age groups including children, the risk of hypertension also increases.[8]

TYPES OF HYPERTENSION

Hypertension is classified into two types.

1. Primary hypertension: also called as Essential hypertension. It is primary or essential hypertension when the causes are generally unknown. This accounts to nearly 90 percent of the cases.
2. Secondary hypertension: it is secondary hypertension when the causes are known, such as diseases of the kidney, tumours of adrenal gland, consumption of drugs like steroid, oral pills, congenital narrowing of the aorta, etc. This accounts to about 10 percent of all cases.

Clinical Manifestations

The most consistent symptom is headache. It is early morning, sub-occipital pulsating headache. It is often associated with stiffness of the neck, awakening the patient from sleep and gives relief after vomiting.

Other features are

- Dizziness.
- Palpitation.
- Fatigue.
- Epitasis.
- Blurring of vision.
- Breathlessness.
- Personality changes.

Complications are

- Angina pectoris.
- Myocardial infarction.
- Stroke (Cerebral thrombosis, hemiplegia, cerebral haemorrhage).
- Renal failure.

Ocular manifestations are

- Blurring vision.
- Scotoma (unilateral/bilateral).
- Papilledema.
- Exudates on the retina.

Ayurvedic perspective

Though the exact nomenclature of the disease is controversial, the signs and symptoms of the disease can be understood in terms of dosha, dushya, srotases, etc. Looking at hypertension from this point of view, we can assume that vitiated vata is the main cause of the disease, as the dhatugati (rasa gati) or vikshepa is achieved by vayu itself.[9] Pitta and kapha compliment the effect of vitiated vata and support the progress of the disease with rasa, rakta being the main mediator of vitiation. This suggests the involvement of Tridosha in hypertension. Based on previous work done, hypertension is nothing but a 'Vata Pradhan Tridosha Vyadhi', influenced by mana. Sharira and mana (satva) have been designated as the habitats of vyadhi by Acharya Charaka.[10]

Ayurvedic scholars suggested different names to demonstrate the phenomenon- like
Rakta Gata Vata (Y.N. Upadyaya- 1950).
Avritta Vata (Acharya R.K. Sharma- 1966).
Dhamani Prapurnata (Acharya A.D. Athavale- 1977).
Rakta Vriddhi (Acharya G.N. Chaturvedi- 1981).
Rakta Vikshepa (Shukla J.P.- 1954).
Rakta Chapa (Ravani & Mahaishkar U.B. 1967).
Rakta Sampida (Pandey S.B. 1972).
VyanaBala (Triguna B. 1974).
Dhamanipratichaya (Athawale A.D.).
Rasa Bhara (Athawale T.S. 1979).
Rudhira Mada (Dwivedi V.N. 1991).

Rakta Vata (Sharma P.V. 1993).[11]

DISCUSSION

On the basis of the above literature, the following measures have been mentioned which are useful for preventing and controlling hypertension.

1. Dietary modification.
2. Lifestyle modification.

Dietary modification

Dietary modification is very important to prevent the development of hypertension or potentially combat and reduce high blood pressure. Lowering sodium intake (especially from table salt) reduces excessive water retention, which helps maintain normal blood pressure.[12] Excessive use of sodium chloride is toxic and damaging to arteries and other tissues, which may initiate atherosclerosis and lead to hypertension. Adopting a high potassium diet helps get rid the renal system of excess sodium and restore sodium or potassium balance. Acharya Charaka has also considered lavana as a substance not to be used in excessive quantity for longer duration.[13] Additional dietary changes beneficial for reducing blood pressure include adopting a diet which is rich in fruits, vegetables, whole grains and low-fat dairy products, reducing consumption of refined sugar and heavily processed food, reducing caffeine intake, and limiting alcohol consumption.[14]

Reduce sodium intake

Common salt is sodium chloride. High dietary sodium intake is associated with an increased incidence of stroke and with increased risk of death due to coronary heart disease or cardiovascular disease.[15] For a normal healthy person, 2400 mg sodium/day is sufficient which is 6g or 1 teaspoon. Many food additives like cooking soda, baking soda and ajinimotto are basically sodium salts. Pickles, papad, sauces contain salt as preservatives. Cheese, processed food, salted snacks such as biscuits, chips, popcorn, instant noodles, instant soups, canned foods, etc contain considerable amount of sodium because salt is used in their preparation for taste and preservation. It is not advisable to add salt to food at the table while eating. Therefore, it is advisable to restrict or totally avoid consumption of food containing high sodium. Use of potassium salt or low sodium salt instead of common salt is beneficial.

Improve intake of Calcium, Magnesium and Potassium

It can be done by inclusion of low fat dairy products except cheese to add calcium, green leafy vegetables for magnesium. Potassium- rich whole foods, such as bananas, kiwi fruit, watermelon, avocado, potatoes (with skin), tomatoes, oranges, sweet lime, leafy vegetables, milk, soya bean, nuts, almonds and yoghurt are more effective in reducing blood pressure than potassium supplements, which are potentially toxic.[16] Garlic is most effective in hypertension, relieves dizziness, numbness, shortness of breath and abdominal distension. Indian gooseberry (amla) juice with 2 teaspoons honey is beneficial. Cucumber, carrot, tomatoes, onion, radish, cabbage and spinach are best consumed in salad form in raw condition.

Increase intake of PUFA (polyunsaturated fatty acids)

Long chain omega-6 and foods rich in omega-3 like sunflower, cottonseed and fish oils, which have anti-inflammatory and anti-blood clotting effects and is significantly beneficial for the heart. Omega-3 is further categorized as alpha linoleic acid and docosahexaenoic acid (DHA). DHA appears to have specific benefits on blood pressure such as to attenuate pathogenesis of renin-dependent hypertension.

Include MUFA (monounsaturated fatty acids)

Example, omega-9 MUFA such as olive oil and canola oil.

Reduction in simple carbohydrate food

Though it does not affect the blood pressure directly but preparations usually contain more salt and fat.

Addition of herbs like coriander, mint or garlic or lemon juice

Improves the taste and flavour and reduces the need to add more salt.

The DASH diet[17]

It is a dietary approach to stop hypertension. It is an important step in controlling blood pressure. DASH diet is found to be a very good approach. It is an eating plan that emphasizes consumption of fruits, vegetables and low sodium, low fat, dairy foods, low amount of saturated fat, total fat and cholesterol to reduce blood pressure. The DASH diet includes whole grains, poultry, fish and nuts. It adopts reduced amounts of fats, red meats, sweets and sugared beverages. It includes foods that are rich in potassium, calcium, omega-3 and

magnesium. The diet is not only rich in important nutrients and fibres but also includes food that contain two and a half times the amounts of electrolytes, potassium, calcium and magnesium.

It makes the following recommendations

- To avoid saturated fats.
- To include MUFA.
- To include PUFA.
- To choose whole grains over white flour.
- To include fresh fruits and vegetables daily, especially potassium rich fruits like bananas, oranges and vegetables like carrots, spinach, mushrooms, beans and potatoes.
- To include nuts, seeds or legumes (dried beans or peas daily).
- To choose moderate amount of protein preferably fish or poultry. Oily fish may be particularly beneficial.

A combination of DASH diet and salt restriction is very effective in reducing blood pressure.

Lifestyle modification

On weight

Low intensity physical exercise like brisk walking for about 30 minutes daily is useful. Weight reduction is done by controlling the diet and promotion of physical activities. Regular physical activity leads to fall in body weight, blood lipid and blood pressure. Maintenance of normal body weight is important, preferably a BMI 18.5-24.9 kg/m^2 for adults.

On behavioural changes

Modification in the personal lifestyle, reduction in stress, practicing yoga and meditation goes side by side in controlling blood pressure. Cessation of alcohol intake and smoking. Relaxation techniques like breathing exercises or pranayam.

Health education

People are to be made health conscious about hypertension and its consequences and encouraged to practice health promotive measures.

Self-care

Hypertensive patients should be taught to take care of themselves by maintaining a diary notebook of their blood pressure readings which will be helpful for follow-up.

Recreation

The establishment of recreation clubs, involving in hobbies like gardening, music, excursions, cultural shows, etc will help to relieve stress.

Yoga

Stress reduction from practicing meditation, yoga and other mind-body relaxation techniques can lower blood pressure.[18] Yoga is formulated for many reasons and health restoration is one of them. Shavasana, Bhujangasana, Siddhasana, Dhanurasana, Makarasana, Vajrasana, Yoganidra, along with regular practice of pranayama like Anulom-Vilom and Bhramari pranayama, are found to be very useful for lowering blood pressure in normal as well as hypertensive individuals if performed accurately and adopted as a lifestyle.[19]

CONCLUSION

After thorough study of literature and fundamentals in both Ayurveda and modern sciences, it is concluded that diet and lifestyle modification is very important in the prevention and management of a disease. It can be said that hypertension can be prevented and controlled by following the diet changes (pathya and apathy ahara) and lifestyle changes (pathya and apathy ahara). Therefore, diet and lifestyle modification can be considered as an important and effective first line of treatment strategy in hypertension. In addition to the significant lowering of blood pressure achieved through changes in eating patterns, moderating alcohol intake, weight loss and regular physical activity, lifestyle measures (including smoking cessation) confer other significant cardiovascular health benefits.

REFERENCES

1. Moses M, Roccella EJ, The treatment of hypertension: a remarkable success story, J Clin Hypertene (Greenwich), 2013; 15: 88-91.
2. Whelton P.K, Global burden of hypertension: an analysis of worldwide data, The Lancet, 2005; 365(9455): 217-223.
3. Lawrence M. Tierney, Jr. Stephen J, McPhee, Maxine A. Papadakis, Current Medical Diagnosis and Treatment forty-first edition. Lange Medical Books, 2002; 462-463.
4. WHO Report of Prevention and Control for Cardiovascular diseases, 2001-2002.

5. Tabers Cyclopedic Medical Dictionary, 20th edition, 2005, page no. 268.
6. Ibid-9, page 1039.
7. World Health Organization, International Society of Hypertension Writing Group, 2003 World Health Organization (WHO)/ International Society of Hypertension (ISH) statement on management of hypertension. J Hypertens, 2003; 21: 1983-1992.
8. Siddhart N. Shah. API Textbook of Medicine, 7th Edition, 2003.
9. Charaka Samhita, Vaidya Yadavaji Trikamaji Acharya, Chaukhambasurbharatiprakashana, reprint 2000, Ch. Su. 18/49.
10. Ibid-13, 44-46.
11. Rajshekarasanapeti, Clinical Study on the effect of Takradhara in the Essential Hypertension.
12. L.J. Appel et al. "A clinical trial of the effects of dietary patterns on blood pressure." New England Journal of Medicine, 1997; 336(16): 1117-24.
13. Dr. Brahmanand Tripathi, Charaka Samhita Vol. 1, Chaukhambha Surbharati Prakashan, Varanasi, 2009, Vimanasthana 1/15; page-660.
14. R.J. Padwal et al. "The 2010 Canadian Hypertension Education Program recommendations for the management of hypertension: Part 2- Therapy." The Canadian Journal of Cardiology., 2010; 26(5): 249-258.
15. National Heart Foundation of Australia. Summary of evidence statement of the relationship between dietary electrolytes and cardiovascular disease. October, 2006.
16. National Heart Foundation of Australia. Summary of evidence statement of the relationship between dietary electrolytes and cardiovascular disease. October, 2006.
17. National Heart Foundation of Australia. Summary of evidence statement of the relationship between dietary electrolytes and cardiovascular disease. October, 2006.
18. M.V. Rainforth et al. "Stress Reduction Programs in Patients with Elevated Blood Pressure: A Systematic Review and Meta-analysis." Current Hypertension, 2007; 9(6): 520-8.
19. (http://nopr.niscair.res.in/bitstream/123456789/8524/1/IJTK%204(4)%20367-372.pdf)