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A CASE STUDY ON HYPERTENSION (HTN) AND ITS MANAGEMENT BY MODIFIED LIFESTYLE CHANGES – AN AYURVEDIC PERSPECTIVE

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ABSTRACT

Introduction: Hypertension, commonly referred to as high blood pressure, is a leading contributor to cardiovascular diseases globally. Despite being asymptomatic in its early stages, it is a significant risk factor for severe complications such as stroke, heart disease, kidney failure, and vascular damage. According to the World Health Organization, hypertension is responsible for 57% of all stroke-related deaths and 24% of coronary heart disease (CHD) deaths in India. In Ayurvedic medicine, hypertension is interpreted through key principles of *Tridosha* (Vata, Pitta, Kapha), *Dhatus* (tissues), and *Srotas* (body channels), recognizing the interplay between body, mind, and environment. Imbalances in these factors, often exacerbated by poor lifestyle choices, trigger the onset of hypertension. A 52-year-old male patient presented with poorly controlled hypertension, exhibiting symptoms of headaches, dizziness, and fatigue. He led a sedentary lifestyle with poor dietary habits, including high salt intake, smoking, and alcohol consumption. Clinical examination revealed blood pressure of 160/100 mmHg, consistent with stage 2 hypertension. The patient was advised to adopt comprehensive lifestyle modifications based on Ayurvedic principles and the DASH diet, with a focus on dietary adjustments, increased physical activity, stress management, and cessation of smoking and alcohol. **Results**: Following the implementation of lifestyle changes, the patient's blood pressure decreased from 160/100 mmHg to 130/80 mmHg, and his BMI reduced from 28.5 kg/m^2 to 26.0 kg/m^2. His lipid profile also improved, with reductions in total cholesterol (220 mg/dL to 190 mg/dL) and LDL cholesterol (150 mg/dL to 120 mg/dL). The patient successfully quit smoking and reduced alcohol intake while incorporating regular physical exercise and stress management techniques such as yoga and meditation into his daily routine. **Conclusion**: This case highlights the significant role that lifestyle changes, in conjunction with Ayurvedic principles and modern medical practices, can play in the management of hypertension. The integration of the DASH diet, physical activity, stress reduction, and smoking cessation resulted in improved cardiovascular health and reduced risk for complications. Early intervention, patient education, and continuous monitoring remain crucial in preventing the irreversible damage caused by uncontrolled hypertension.

Keywords: Hypertension, Ayurvedic principles, lifestyle changes, DASH diet, blood pressure management, cardiovascular health,

INTRODUCTION

In the current era of rapid modernization and technological advancement, the prevalence of lifestyle disorders has surged, with hypertension being one of the most significant contributors to global health issues. Hypertension, or high blood pressure, is a leading cause of cardiovascular diseases, affecting millions of people worldwide. According to the World Health Organization, hypertension was responsible for 57% of all stroke deaths and 24% of all coronary heart disease (CHD) deaths in India. Despite its silent and asymptomatic nature in many individuals, hypertension is known as a "silent killer" due to its potential to cause severe complications in the brain, heart, kidneys, and blood vessels if left untreated.[1]

From an Ayurvedic perspective, hypertension does not align directly with any single disease classification but can be interpreted through various principles and concepts of *Tridosha* (the three biological energies: *Vata*, *Pitta*, and *Kapha*), *Srotas* (body channels), and *Dhatus* (tissues).2 Ayurveda emphasizes the interconnectedness of body, mind, and environment, suggesting that disturbances in these balances—often caused by improper lifestyle and diet—trigger the pathogenesis of conditions like hypertension.[3]

In Ayurveda, hypertension can be linked to imbalances in *Vata*, *Pitta*, and *Kapha*, along with disturbances in the *Rakta* Dhatu (blood) and the channels of circulation. Concepts such as *Shad Kriyakala* (six stages of disease progression) and *Avarana* (occlusion of the normal flow of *Doshas*) help explain the disease's onset and development. While modern medicine focuses on managing hypertension with pharmacological interventions, Ayurveda proposes a more preventive approach, stressing the importance of lifestyle modifications and the balance of *Doshas* for long-term health and disease prevention.[4]

CASE REPORT

Patient History: The patient, a 52-year-old male, presented with complaints of headaches, occasional dizziness, and persistent fatigue for the last three months. He had a known history of hypertension, which had been poorly controlled due to non-compliance with prescribed medications. His previous medical history included borderline hyperlipidemia and a family history of cardiovascular diseases. He had a sedentary lifestyle with minimal physical activity, a diet high in salt and processed foods, and high stress levels due to work-related factors. The patient had been smoking for over 20 years and consumed alcohol regularly.

Table No. 1 Vital Examination

Vital Sign	Measurement	Normal Range
Blood Pressure	160/100 mmHg	120/80 mmHg
Heart Rate	88 beats per minute	60-100 beats per minute
Respiratory Rate	16 breaths per minute	12-20 breaths per minute
Temperature	98.6°F (37°C)	97°F - 99°F (36.1°C - 37.2°C)
Oxygen Saturation	98% on room air	95-100%
Body Mass Index	28.5 kg/m^2	18.5-24.9 kg/m^2

Clinical Examination: On initial examination, the patient's blood pressure was measured at 160/100 mmHg, consistent with stage 2 hypertension. His body mass index (BMI) was 28.5 kg/m^2, indicating overweight status. Physical examination revealed no other significant abnormalities.

Investigations: Routine blood investigations were conducted, including a lipid profile, renal function tests. The results indicated:

Diagnosis: The patient was diagnosed with essential hypertension, likely exacerbated by poor lifestyle choices, including a high-salt diet, smoking, alcohol consumption, stress, and lack of physical activity.

Management Plan: The management strategy was focused on comprehensive lifestyle changes, with an emphasis on Ayurvedic principles and dietary modifications alongside pharmacological treatment. The patient was educated on the importance of lifestyle changes in controlling hypertension and preventing complications.

1. **Dietary Modifications:**

The patient was advised to reduce salt intake to less than 5 grams per day and to avoid processed and junk foods high in sodium. The *Dietary Approaches to Stop Hypertension* (DASH) diet, rich in fruits, vegetables, whole grains, and low-fat dairy, was recommended to improve blood pressure control and overall cardiovascular health. Foods rich in potassium,

calcium, and magnesium, such as leafy greens, bananas, and nuts, were emphasized to support blood pressure regulation. Intake of caffeine and alcohol was reduced significantly.

2. **Physical Activity:** The patient was encouraged to engage in regular physical activity, including 30-45 minutes of moderate aerobic exercise such as brisk walking or cycling at least five days a week. This aimed to improve cardiovascular health, reduce blood pressure, and aid in weight loss.
3. **Stress Management:** Stress was identified as a major contributing factor to the patient's elevated blood pressure. The patient was taught relaxation techniques, including deep breathing exercises, yoga, and meditation to help manage stress and promote mental well-being.
4. **Smoking and Alcohol Cessation:** Smoking cessation support was provided through counseling and nicotine replacement therapy (NRT). The patient was also advised to limit alcohol intake, following a gradual reduction plan.

Follow-up and Outcome:

Table No. 2 Before and After Treatment Comparison with July 2024 Follow-up

Parameter	Before Treatment (Life Style Changes)	After Treatment (Life Style Changes)	1 to 7 July 2024	8 to 14 July 2024	15 to 21 July 2024	22 to 28 July 2024
Blood Pressure	160/100 mmHg	130/80 mmHg	134/82 mmHg	130/78 mmHg	128/77 mmHg	130/80 mmHg
Heart Rate	88 bpm	72 bpm	74 bpm	71 bpm	70 bpm	68 bpm
Respiratory Rate	16 breaths/min	14 breaths/min	14 breaths/min	14 breaths/min	14 breaths/min	14 breaths/min
Body Mass Index (BMI)	28.5 kg/m^2 (overweight)	26.0 kg/m^2	26.3 kg/m^2	26.1 kg/m^2	26.0 kg/m^2	25.9 kg/m^2
Total Cholesterol	220 mg/dL	190 mg/dL	195 mg/dL	190 mg/dL	188 mg/dL	185 mg/dL
LDL Cholesterol	150 mg/dL	120 mg/dL	120 mg/dL	117 mg/dL	116 mg/dL	114 mg/dL
Fasting Blood Sugar	110 mg/dL	100 mg/dL	100 mg/dL	96 mg/dL	95 mg/dL	93 mg/dL

Smoking	Active smoker (20 years)	Smoking cessation	Quit smoking	Non-smoker	Non-smoker	Non-smoker
Alcohol Consumption	Regular intake	Minimal alcohol consumption	Minimal alcohol	Occasional alcohol	No alcohol	No alcohol
Physical Activity	Sedentary	Regular aerobic exercise (5 days/week)	Regular exercise	Regular exercise	Regular exercise	Regular exercise
Stress Management	High stress, no specific management	Practicing yoga, meditation	Practicing meditation	Practicing meditation	Yoga and meditation	Yoga and meditation

Before Treatment: The patient led a sedentary lifestyle with poor diet (high salt intake, processed foods), was a regular smoker and drinker, and had high stress levels with no regular stress management practices. **After Treatment:** The patient adopted a healthier lifestyle with regular exercise, reduced salt intake, quit smoking, minimized alcohol consumption, and incorporated stress management techniques such as yoga and meditation.

Table No. 3 Blood Pressure Monitoring Chart

Date	Systolic BP (mmHg)	Diastolic BP (mmHg)
1 July 2024	134	82
2 July 2024	138	84
3 July 2024	137	83
4 July 2024	136	83
5 July 2024	136	82
6 July 2024	135	82
7 July 2024	134	82
Date	**Systolic BP (mmHg)**	**Diastolic BP (mmHg)**
8 July 2024	130	78
9 July 2024	133	80
10 July 2024	132	80

11 July 2024	132	79
12 July 2024	131	79
13 July 2024	130	79
14 July 2024	130	78
Date	**Systolic BP (mmHg)**	**Diastolic BP (mmHg)**
15 July 2024	128	77
16 July 2024	129	78
17 July 2024	129	77
18 July 2024	128	77
19 July 2024	128	76
20 July 2024	128	76
21 July 2024	128	75
Date	**Systolic BP (mmHg)**	**Diastolic BP (mmHg)**
22 July 2024	126	73
23 July 2024	127	74
24 July 2024	126	74
25 July 2024	126	73
26 July 2024	126	73
27 July 2024	125	73
28 July 2024	130	80

The blood pressure consistently improved from **134/82 mmHg on 1 July 2024** to **126/73 mmHg by 28 July 2024**. The steady reduction in systolic and diastolic blood pressure reflects the effectiveness of lifestyle changes and treatment adherence over the monitored period.

Table No. 4 Lipid Profile -Follow-Up

Parameter	Before Treatment (Lifestyle Changes)	After Treatment (Lifestyle Changes)	1 to 7 July 2024	8 to 14 July 2024	15 to 21 July 2024	22 to 28 July 2024
Total Cholesterol	220 mg/dL	190 mg/dL	195 mg/dL	190 mg/dL	188 mg/dL	185 mg/dL
LDL Cholesterol	150 mg/dL	120 mg/dL	120 mg/dL	117 mg/dL	116 mg/dL	114 mg/dL
HDL Cholesterol	40 mg/dL	50 mg/dL	48 mg/dL	50 mg/dL	51 mg/dL	52 mg/dL
Triglycerides	180 mg/dL	145 mg/dL	150 mg/dL	145 mg/dL	143 mg/dL	140 mg/dL
VLDL Cholesterol	36 mg/dL	29 mg/dL	30 mg/dL	29 mg/dL	28.6 mg/dL	28 mg/dL

Table No. 5 Renal Function Tests

Parameter	Before Treatment (Lifestyle Changes)	After Treatment (Lifestyle Changes)	1 to 7 July 2024	8 to 14 July 2024	15 to 21 July 2024	22 to 28 July 2024
Serum Creatinine	0.9 mg/dL	0.9 mg/dL	0.9 mg/dL	0.9 mg/dL	0.9 mg/dL	0.9 mg/dL
Blood Urea Nitrogen (BUN)	18 mg/dL	16 mg/dL	16 mg/dL	16 mg/dL	15.5 mg/dL	15 mg/dL
Serum Uric Acid	5.2 mg/dL	4.8 mg/dL	4.9 mg/dL	4.8 mg/dL	4.7 mg/dL	4.6 mg/dL
Glomerular Filtration Rate (GFR)	95 mL/min	98 mL/min	97 mL/min	98 mL/min	99 mL/min	99 mL/min

The patient successfully quit smoking, reduced his alcohol consumption to minimal levels, and incorporated yoga and meditation into his daily routine for stress management. He also adhered to the DASH diet and continued physical exercise.

Table No. 6 Dash Diet for Hypertension in a Do's And Don'ts:

Do's (Recommended)	Don'ts (Avoid)
Increase Fruits and Vegetables: Aim for 4-5 servings of each per day. Rich in potassium and magnesium which help lower blood pressure.	**Avoid Processed and Packaged Foods**: High in sodium, preservatives, and unhealthy fats. Examples: Canned soups, processed meats, frozen meals.
Choose Whole Grains: Whole grains like brown rice, quinoa, and whole wheat bread are high in fiber and nutrients.	**Limit Sugary Foods and Beverages**: Excess sugar leads to weight gain and increased blood pressure. Examples: Sodas, candies, sweetened juices.
Include Low-Fat Dairy Products: 2-3 servings per day of skim milk, low-fat yogurt, and low-fat cheese for calcium and protein.	**Reduce Saturated and Trans Fats**: Found in fatty meats, full-fat dairy, and fried foods, these raise cholesterol and blood pressure.
Opt for Lean Proteins: Choose skinless poultry, fish, and plant-based proteins like beans and lentils.	**Avoid Excessive Salt**: Salt increases blood pressure. Examples: Table salt, soy sauce, pickles, and salty snacks.
Consume Healthy Fats: Use olive oil, avocado, nuts, and seeds, which contain monounsaturated and polyunsaturated fats.	**Limit Alcohol**: Excessive alcohol raises blood pressure. Limit to 1 drink/day for women, 2 drinks/day for men.
Increase Potassium Intake: Potassium-rich foods like bananas, spinach, and potatoes help balance sodium and lower blood pressure.	**Avoid High-Fat Dairy**: Full-fat milk, cheese, and butter are high in saturated fats that raise blood pressure and cholesterol.
Stay Hydrated: Drink plenty of water and herbal teas to maintain circulation and regulate blood pressure.	**Avoid Fried and Fast Foods**: High in unhealthy fats and sodium, contributing to hypertension and weight gain.
Limit Sodium Intake: Keep sodium intake under 2,300 mg/day, or lower to 1,500 mg/day for severe hypertension.	**Avoid Red Meat**: High in saturated fats. Limit intake and opt for leaner protein sources like chicken or fish.
Eat Nuts, Seeds, and Legumes: 4-5 servings per week provide heart-healthy fats, protein, and magnesium.	**Limit Commercial Snacks**: These often contain hidden sodium and unhealthy fats. Examples: Chips, crackers, and microwave popcorn.

DISCUSSION:

In the current era of rapid modernization and technological advancement, the prevalence of lifestyle disorders, particularly hypertension, has surged dramatically, contributing

significantly to global health issues.[5] **Hypertension**, also known as **high blood pressure**, remains one of the most prevalent cardiovascular disorders, affecting millions of individuals worldwide.[6] According to the **World Health Organization**, hypertension accounts for **57% of all stroke deaths** and **24% of coronary heart disease (CHD) deaths in India**.[7] Despite its widespread impact, hypertension is often referred to as a "silent killer" because many individuals remain asymptomatic during the early stages.[8] Left untreated, it can cause **irreversible damage** to vital organs, including the **heart, brain, kidneys, and blood vessels**.[9]

Prevalence of Hypertension-Related Deaths: The data shows that hypertension contributes to more than half of all stroke deaths (57%) and about one-quarter of all CHD deaths (24%), making it a significant public health concern.[10] These statistics highlight the necessity of early diagnosis, continuous monitoring, and comprehensive treatment to reduce mortality rates from hypertension-related complications.[11]

From an **Ayurvedic perspective**, hypertension does not align directly with any single disease classification but can be understood through key concepts such as *Tridosha* (the three biological energies: *Vata*, *Pitta*, and *Kapha*), *Dhatus* (tissues), and *Srotas* (body channels).[12] Ayurveda emphasizes a **holistic view**, focusing on the interrelationship between the body, mind, and environment. Imbalances in these systems—commonly triggered by an improper diet, lack of physical activity, and stress—can lead to diseases like hypertension. Concepts such as **Shad Kriyakala** (the six stages of disease progression) and **Avarana** (occlusion of the normal flow of *Doshas*) are used to explain the gradual onset and pathogenesis of hypertension.[13]

Tridosha Imbalance: Imbalances in *Vata* (responsible for movement), *Pitta* (responsible for metabolism), and *Kapha* (responsible for stability and structure) disrupt the normal functioning of the body, leading to conditions such as high blood pressure. Specifically, an increase in *Vata* and *Pitta* is often linked to hypertension. **Avarana**: This concept refers to the obstruction of normal *Dosha* functions, particularly the occlusion of *Vata* by *Kapha* or *Pitta*, which can impair circulation and lead to hypertension.[14]

While **modern medicine** focuses on pharmacological treatments to reduce blood pressure, **Ayurveda** advocates for a preventive approach, emphasizing lifestyle modifications and the balancing of *Doshas* for long-term health. The integration of dietary management, physical

activity, stress reduction, and appropriate pharmacological support has been shown to be highly effective in controlling hypertension.[13]

RESULTS AFTER LIFESTYLE CHANGES:

The comprehensive lifestyle changes, including the **DASH diet**, regular **physical activity**, **stress management**, and smoking cessation, have led to significant improvements in the patient's health. The patient's **blood pressure** decreased from **160/100 mmHg** to **130/80 mmHg**, which falls into the **normal range**, reducing the risk for complications like stroke or heart attack. The reduction in **BMI** indicates successful weight management, contributing to overall cardiovascular health. The improvement in **lipid profile** reflects a decreased risk for atherosclerosis and related cardiovascular events.

CONCLUSION

The case of hypertension presented here highlights the profound impact of lifestyle modifications in managing and reducing the risk of complications associated with high blood pressure. Through the integration of **Ayurvedic principles** and **modern medical practices**, the patient achieved significant improvements in blood pressure, body mass index, and lipid profile. Specifically, the **DASH diet**, along with **regular physical activity**, **stress management**, and **smoking cessation**, played a pivotal role in lowering blood pressure from **160/100 mmHg** to **130/80 mmHg**, reducing the risk of severe cardiovascular events such as **stroke** and **coronary heart disease**. The patient's successful adaptation to lifestyle changes resulted in better control over both physiological and psychological factors contributing to hypertension. Weight loss, improved lipid levels, and enhanced cardiovascular health were achieved by targeting root causes such as **poor diet**, **sedentary behavior**, and **high-stress levels**. This case underscores the importance of a **holistic approach** in the long-term management of hypertension, combining **dietary adjustments**, **exercise**, and **stress reduction** with appropriate medical interventions to optimize patient outcomes. With the growing global burden of hypertension, early intervention, patient education, and continuous monitoring are essential to prevent the irreversible damage caused by uncontrolled high blood pressure.

CONFLICT OF INTEREST –NIL

SOURCE OF SUPPPORT- NONE

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