

Review

Understanding Hypertension: Causes and Symptoms

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Abstract:

The converting of daily lifestyles and dietary routine of both populations guide to advanced cardiovascular incident and atherosclerosis both of which related to high blood pressure (it is known as BP). By the stationary aspects, as in this analysis, observe that the gender, age, geographical location, sociodemographic characteristics that could be encourage the hypertension occurrence. It is described as rise in the mean pulmonary arterial pressure (>25 mmHg) at resting time, estimate by precise cardiac catheterization. Hypertension in the arteries, pulmonary hypertension brought on by left heart disease, pulmonary hypertension brought on by hypoxemia or lung disease, thromboembolic pulmonary hypertension, and pulmonary hypertension with several contributing factors. Something has happened since well after 2nd world war that hypertension finally been acknowledged as the cause of so much heart attack, kidney disease, stroke. In present pharmacotherapies has been enhance patient quality of existence, pulmonary arterial hypertension drugs be miserable from restriction in the form of temporary pharmacokinetics, instability, defective organ specificity. Conventionally, nanotechnology-based delivery master plan has been proved advantageous at enhancing both circulation lifespan of chemotherapeutics & accumulation in tumour's due to increasement permeability through fenestrated vasculature.

Keywords: daily lifestyles, dietary routine, nanotechnology-based delivery master plan

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Introduction

Hypertension, or high blood pressure, is a medical condition characterized by consistently elevated pressure in the arteries. It is defined as having a blood pressure reading of 130/80 mm Hg or higher. This condition can lead to serious health complications if not managed effectively, including heart disease, stroke, and kidney damage. A lot of deep-rooted hypertensions in the end precede to cardiac infarction but this series of incident apart from that break in other effect and, as outcome patients with cardiac infarction. Hypertension is one of the generally attend condition in today medical

practice, however in spite of lengthy history, neglect until the midpoint of the 20th century. In our societies 30% of adults are affected by them. It is probably caused for the worldwide. It is liable of 62% of heart disease and it is also responsible for 49% of major blood vessels heart problem as well as a roughly data say that every year 7.1 million people deaths cause is hypertension. Hypertension is a significant public health concern worldwide, affecting an estimated 1.28 billion people aged 30 to 79, according to the World Health Organization. In the United States, nearly 47% of adults have high blood pressure, with prevalence rates climbing as

individuals age. (4) It's particularly common in older adults, with more than half of those over 60 affected. The condition is also influenced by various factors, including lifestyle choices, socioeconomic status, and genetic predisposition. Populations in low- and middle income countries are increasingly facing hypertension due to changes in diet, urbanization, and reduced physical activity. Moreover, the burden of hypertension is not evenly distributed across different demographics. Studies show that certain groups, such as African Americans, tend to experience higher rates of hypertension compared to other ethnicities. Despite its prevalence, many individuals remain unaware of their condition, highlighting the importance of regular screening and education about heart health. Efforts to combat hypertension focus on promoting healthier lifestyles, improving access to healthcare, and implementing public health initiatives aimed at raising awareness and prevention. (1,2,6) **Causes and Risk Factors:**

1. Genetics
2. Age
3. Obesity
4. Sedentary lifestyle
5. Smoking
6. High sodium intake
7. Stress
8. Sleep apnea
9. Kidney disease
10. Hormonal imbalances

Genetics: -

Family History: Individuals with a family history of high blood pressure are at a greater risk, suggesting a hereditary component. Specific genetic variations may affect how the body regulates blood pressure. **Gene Variants:** Certain genes have been linked to hypertension, influencing blood vessel function, sodium handling, and hormonal regulation.

Ethnic Background: Some ethnic groups, particularly African Americans, have a higher prevalence of hypertension, which may be partly attributed to genetic factors. (9) **Age:**

Vascular Changes: As people age, blood vessels naturally lose elasticity, which can lead to increased stiffness and higher blood pressure.

Hormonal Changes: Aging can affect hormone levels, including those that regulate blood pressure, such as aldosterone and renin.

Cumulative Effects: Over time, exposure to various risk factors (like diet and lifestyle) can accumulate, increasing the likelihood of developing hypertension. Some other risk factor in age includes:

- Increased Blood Volume
- Chronic Health Conditions
- Medication Use
- Lifestyle Factors
- Social and Psychological Factors .

Obesity: -

More Blood to Pump: When someone is obese, their body has more fat, which means more blood is needed to supply that tissue. This extra blood increases pressure in the arteries.

Hormonal Changes: Extra fat can mess with hormones that help regulate blood pressure. For instance, insulin and leptin levels can become unbalanced, contributing to higher blood pressure.

Inflammation: Fat tissue can release substances that cause inflammation, which can affect how blood vessels work and lead to increased blood pressure.

Stiff Blood Vessels: Being overweight can make blood vessels stiffer, making it harder for them to stretch and accommodate blood flow, which raises blood pressure.

Sedentary lifestyle: -

Less Physical Activity: When people don't move much, they miss out on the benefits of exercise, which helps keep blood vessels healthy and lowers blood pressure.

Weight Gain: A lack of movement often leads to weight gain, and being overweight is a significant risk factor for high blood pressure.

Poor Circulation: Sitting for long periods can affect circulation, leading to stiff arteries and higher blood pressure.

Increased Stress: A sedentary lifestyle can lead to increased stress levels, which can further raise blood pressure.

Some other risks include

- Unhealthy diet • Chronic conditions • Mental health • Work environment

Smoking: -
Slim Blood Vessels: Smoking can damage the lining of blood vessels, causing them to narrow. This increases the resistance blood faces as it flows, raising BP.

Grow Heart Rate: Nicotine in cigarettes stimulates the heart, causing it to beat faster and putting more pressure on the arteries.

Lower Oxygen Supply: Smoking decreases the amount of oxygen in the blood, forcing the heart to

work harder to deliver oxygen to the body, which can elevate BP.

Inflammation: Chemicals in tobacco can cause inflammation throughout the body, contributing to stiffness in blood vessels and higher blood pressure. Some other risks include

- Addiction • Other health issues •

Environmental exposure

High sodium intake: -

Water Retention: Consuming too much sodium can cause the body to retain water, increasing blood volume and putting extra pressure on blood vessels.

Stiff Blood Vessels: Excess sodium can lead to changes in blood vessel function, making them stiffer and less able to expand, which raises blood pressure.

Hormonal Effects: High sodium levels can affect hormones that help regulate blood pressure, leading to further increases.

Increased Blood Pressure Response: Some people are more sensitive to sodium, meaning their blood pressure can rise significantly with even moderate sodium intake.

Stress: -

Temporary Blood Pressure Spikes: When you experience stress, your body releases hormones like adrenaline, which can temporarily raise blood pressure by increasing heart rate and narrowing blood vessels.

Chronic Stress Effects: Long-term stress can lead to consistent high blood pressure as the body remains in a heightened state of alertness, causing ongoing strain on the cardiovascular system. **Unhealthy Coping**

Mechanisms: Many people manage stress through unhealthy habits, such as overeating, smoking, or drinking alcohol, all of which can negatively impact blood pressure.

Inflammation: Chronic stress may lead to inflammation in the body, which can affect blood vessel function and contribute to elevated blood pressure. **Sleep apnea: -**

Interrupted Breathing: Sleep apnea causes pauses in breathing during sleep, leading to drops in oxygen levels. This can stress the cardiovascular system and raise blood pressure.

Increased Heart Workload: The heart works harder to pump blood and maintain oxygen levels during these interruptions, which can elevate blood pressure over time.

Hormonal Changes: Sleep apnea triggers the release of stress hormones, like cortisol, that can contribute to higher blood pressure.

Inflammation: The condition can cause inflammation in the body, which may affect blood vessel function and contribute to hypertension.

Kidney disease: -

Fluid Balance: Healthy kidneys help regulate the body's fluid balance. When kidney function declines, the body may retain excess fluid, leading to increased blood volume and higher blood pressure. **Hormonal Regulation:** The kidneys produce hormones that help control blood pressure. Impaired kidney function can disrupt this balance, resulting in elevated blood pressure.

Sodium Retention: Damaged kidneys may have difficulty removing excess sodium from the body.

Vascular Damage: Chronic kidney disease can lead to changes in blood vessels, making them stiffer and less able to expand, which can elevate blood pressure. **Hormonal imbalances: -**

Adrenal Hormones: Hormones produced by the adrenal glands, such as cortisol and adrenaline, can increase blood pressure. Conditions like Cushing's syndrome, which results from excess cortisol, can lead to hypertension.

Renin-Angiotensin System: This hormonal system regulates blood pressure. An imbalance can cause the kidneys to retain sodium and water, increasing blood volume and raising blood pressure.

Thyroid Hormones: Both hypothyroidism (low thyroid hormone levels) and hyperthyroidism (high thyroid hormone levels) can affect blood pressure. Hypothyroidism can lead to higher BP, while hyperthyroidism can cause spikes.

Estrogen and Progesterone: Fluctuations in these hormones, particularly during menopause, can affect blood vessel health and contribute to increased blood pressure in women. (8,18,17)

Symptoms

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4. Nosebleeds
5. Fatigue
6. Chest pain.

Often asymptomatic in early stages:- In its initial stages, hypertension often does not present any noticeable symptoms, which is why it's sometimes called the "silent killer." However, as the condition progresses, individuals may begin to experience

Blurred Vision: Changes in vision can be a sign that hypertension is affecting the blood vessels in the eyes.

Shortness of Breath: Difficulty breathing, or shortness of breath may develop, particularly during physical activity.

Headaches: -

Location: These headaches are often felt in the back of the head or the temples.

Intensity: They can range from mild to severe and may be described as throbbing or pulsating. **Timing:** Hypertension-related headaches often occur in the morning after waking up and can improve as the day progresses.

Duration: They can last for a few hours or longer, especially if blood pressure remains elevated.

Associated Symptoms: In some cases, headaches may be accompanied by other symptoms like dizziness, blurred vision, or fatigue.

Dizziness: -

Feeling Lightheaded: People may feel faint or unsteady, as if they might pass out.

Balance Issues: There may be a sensation of being off-balance or having difficulty coordinating movements.

Sudden Onset: Dizziness can occur suddenly, particularly after standing up quickly or during stressful situations.

Accompanying Symptoms: It might be experienced alongside other symptoms such as headaches, shortness of breath, or visual disturbances.

Relief Upon Sitting or Lying Down: Many people find that resting can alleviate the sensation of dizziness.

Nosebleeds: -

Frequency: While not common, individuals with elevated blood pressure might experience more frequent nosebleeds.

Spontaneous Occurrence: Nosebleeds may happen without any apparent reason, such as injury or dry air.

Severity: The bleeding can vary from minor, where only a small amount of blood is present, to more significant bleeding that may require intervention.

Associated Symptoms: Nosebleeds might be accompanied by other symptoms of hypertension, such as headaches or dizziness.

Response to Blood Pressure Fluctuations: Sudden spikes in blood pressure can lead to blood vessel rupture in the nasal passages, resulting in a nosebleed.

Fatigue: -

Persistent Tiredness: People may feel unusually tired or drained, even after a full night's sleep.

Low Energy Levels: A lack of energy can make it difficult to engage in daily activities or exercise.

Difficulty Concentrating: Fatigue can also affect mental clarity, making it hard to focus or think clearly.

Physical Weakness: Individuals might experience a sense of physical weakness, feeling unable to perform tasks that were once easy.

Mood Changes: Fatigue can lead to irritability or a general feeling of being overwhelmed.

Chest pain: -

Radiating Pain: The pain may extend to other areas, such as the arms, back, neck, jaw, or stomach.

Duration: Chest pain related to hypertension may last for a few minutes or longer, especially during periods of stress or physical exertion.

Accompanying Symptoms: It can be accompanied by other symptoms, including shortness of breath, dizziness, sweating, or nausea.

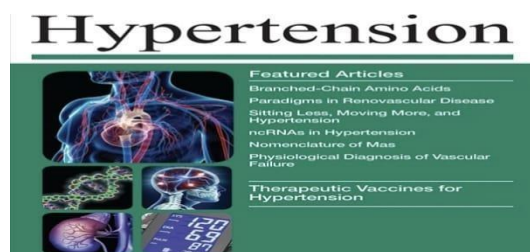
Severity: The intensity of the pain can vary from mild to severe and may feel different from typical muscle aches or digestive discomfort.

Pressure or Tightness: Individuals might feel a sensation of pressure, tightness, or heaviness in the chest.

Duration: Chest pain related to hypertension may last for a few minutes or longer, especially during periods of stress or physical exertion.

Accompanying Symptoms: It can be accompanied by other symptoms, including shortness of breath, dizziness, sweating, or nausea.

Severity: The intensity of the pain can vary from mild to severe and may feel different from typical muscle aches or digestive discomfort.(22,24,11,7,19)



Composition Of Tri-Olmetor
Use, Composition, And side Effect

Key Ingredients

- Olmesartan Medoxomil + Amlodipine + Hydrochlorothiazide

Manufacturer

- Torrent pharmaceuticals Ltd

Products

- Tri-olmetor 40 Tablet
- Tri-olmetor 20 Tablet

Side Effects

- Headache
- Dizziness
- Nausea
- Upper respiratory tract infection
- Fatigue
- Urinary tract infection
- Diarrhea
- Joint swelling
- Peripheral edema
- Nasopharyngitis (inflammation of the throat and nasal passage)
- Muscle spasm



About : Tri-Olmetor 40 Tablet belongs to a group of specifics called 'anti-hypertensives' primarily used

for lowering high blood pressure(hypertension) by removing redundant fluid(electrolytes) from the body. High blood pressure is a habitual condition in which the blood's force against the roadway wall is high. As a result, it increases the threat of heart-related conditions like heart attack, heart failure, stroke, irregular twinkle, and other complications. Depending upon your medical condition, you're advised to take Tri-Olmetor 40 Tablet for as long as your croaker

has specified it for you. The most common side goods of Tri-Olmetor 40 Tablet are nausea, worried stomach, dehumidification, headache, diarrhoea, electrolyte imbalance, headache, feeling exhausted, blown ankles, dizziness, and dropped blood pressure in some cases. utmost of these side goods of Tri-Olmetor 40 Tablet don't bear medical attention and gradationally resolve over time. still, if the side goods are patient, reach out to your croaker.

Conclusion:

Millions of people worldwide are impacted by hypertension, a common health problem. When this quiet ailment is first developing, it typically remains undiagnosed, but if it is not treated, it can have serious consequences. The progress of our understanding of hypertension has been greatly aided by the discovery of the intricate interactions between genetic, lifestyle, and environmental variables. Managing hypertension necessitates a diverse strategy. A balanced diet low in salt, weight control, stress management, regular exercise, and quitting smoking are all important lifestyle changes. When necessary, doctors may prescribe medication to help manage blood pressure, such as beta-blockers, ACE inhibitors, diuretics, and calcium channel blockers. The key to managing hypertension is still prevention. Essential preventative actions include taking regular blood pressure readings, eating a heart-healthy diet, exercising, and keeping a healthy weight. Furthermore, controlling stress and consuming less alcohol improve cardiovascular health in general. Our understanding of hypertension is expanding along with our capacity to control and avoid it. There is potential for bettering patient results from ongoing research into novel therapeutic modalities, such as medication delivery systems based on nanotechnology. The foundation of managing hypertension, however, continues to be early diagnosis by routine examinations and adherence to a healthy lifestyle.

To sum up, high blood pressure is a serious but treatable medical condition. We may try to lessen the impact of this illness globally and enhance public health in general by increasing, encouraging preventative measures, and guaranteeing access to quality healthcare.

References:

- Williams B, Mancia G, Spiering W, Agabiti Rosei E, Azizi M, Burnier M, et al. 2018 ESC/ESH guidelines for the management of arterial hypertension. *Eur Heart J*. 2018;39:3021–3104. - [PubMed](#)
- Chiong JR, Aronow WS, Khan IA, Nair CK, Vijayaraghavan K, Dart RA, et al. Secondary hypertension: current diagnosis and treatment. *Int J Cardiol*. 2008;124:6–21. - [PubMed](#)
- Azizi M, Sapoval M, Gosse P, Monge M, Bobrie G, Delsart P, et al. Optimum and stepped care standardised antihypertensive treatment with or without renal denervation for resistant hypertension (DENERHTN): a multicentre, open-label, randomised controlled trial. *Lancet*. 2015;385:1957–1965. - [PubMed](#)
- Rossi GP, Rossitto G, Amar L, Azizi M, Riester A, Reincke M, et al. Prevalence and outcome of drug-resistant hypertension in primary aldosteronism patients undergoing adrenal vein sampling. *Eur J Prev Cardiol*. 2020. (In press). - [PubMed](#)
- Rossi GP, Seccia TM, Pessina AC. Secondary hypertension: the ways of management. *Curr Vasc Pharmacol*. 2010;8:753–768. - [PubMed](#)
- Hirsch JS, Hong S. The demystification of secondary hypertension: diagnostic strategies and treatment algorithms. *Curr Treat Options Cardiovasc Med*. 2019;21:90. - [PubMed](#)
- Rimoldi SF, Scherrer U, Messerli FH. Secondary arterial hypertension: when, who, and how to screen? *Eur Heart J*. 2014;35:1245–1254. - [PubMed](#)
- Mulatero P, Monticone S, Deinum J, Amar L, Prejbisz A, Zennaro M-C, et al. Genetics, prevalence, screening and confirmation of primary aldosteronism. *J Hypertens*. 2020. (Online ahead of print). - [PubMed](#)
- Rossi GP. Primary aldosteronism: JACC state-of-the-art review. *J Am Coll Cardiol*. 2019;74:2799–2811. - [PubMed](#)
- Monticone S, Burrello J, Tizzani D, Bertello C, Viola A, Buffolo F, et al. Prevalence and clinical manifestations of primary aldosteronism encountered in primary care practice. *J Am Coll Cardiol*. 2017;69:1811–1820. - [PubMed](#)
- Rossi GP, Bernini G, Caliumi C, Desideri G, Fabris B, Ferri C, et al. A prospective study of the prevalence of primary aldosteronism in 1125 hypertensive patients. *J Am Coll Cardiol*. 2006;48:2293–2300. - [PubMed](#)
- Calhoun DA, Nishizaka MK, Zaman MA, Thakkar RB, Weissmann P. Hyperaldosteronism among black and white subjects with resistant hypertension. *Hypertension*. 2002;40:892–896. - [PubMed](#)
- Douma S, Petidis K, Doumas M, Papaefthimiou P, Triantafyllou A, Kartali N, et al. Prevalence of primary hyperaldosteronism in resistant hypertension: a retrospective observational study. *Lancet*. 2008;372:2022. - [PubMed](#)
- Omata K, Satoh F, Morimoto R, Ito S, Yamazaki Y, Nakamura Y, et al. Cellular and genetic causes of idiopathic hyperaldosteronism. *Hypertension*. 2018;72:874–880. - [PMC](#) - [PubMed](#)
- Rossitto G, Amar L, Azizi M, Riester A, Reincke M, Degenhart C, et al. Subtyping of primary aldosteronism in the AVIS-2 study: assessment of selectivity and lateralization. *J Clin Endocrinol Metab*. 2020;105:017. - [PubMed](#)
- Pereira M, Lunet N, Azevedo A, et al. . Differences in prevalence, awareness, treatment and control of hypertension between developing and developed countries. *J Hypertens*. 2009;27:963–975. - [PubMed](#)
- GBD 2015 Risk Factors Collaborators. Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990–2015: a systematic analysis for the Global

- Burden of Disease Study 2015. *Lancet*. 2016;388:1659–1724. - [PMC](#) - [PubMed](#)
18. Salokangas RK, Poutanen O, Stengård E, et al. . Prevalence of depression among patients seen in community health centres and community mental health centres. *Acta Psychiatr Scand*. 1996;93:427–433. - [PubMed](#)
 19. Sandström YK, Ljunggren G, Wändell P, et al. . Psychiatric comorbidities in patients with hypertension – a study of registered diagnoses 2009–2013 in the total population in Stockholm County, Sweden. *J Hypertens*. 2016;34:414–420. - [PubMed](#)
 20. Axon RN, Zhao Y, Egede LE. Association of depressive symptoms with all-cause and ischemic heart disease mortality in adults with self-reported hypertension. *Am J Hypertens*. 2010;23:30–37. - [PubMed](#)
 21. Hamer M, Batty GD, Stamatakis E, et al. . Hypertension awareness and psychological distress. *Hypertension*. 2010;56:547–550. - [PMC](#) - [PubMed](#)
 22. Michal M, Wiltink J, Lackner K, et al. . Association of hypertension with depression in the community: results from the Gutenberg Health Study. *J Hypertens*. 2013;31:893–899. - [PubMed](#)
 23. Babor TF, de la Fuente JR, Saunders J, et al. . AUDIT: the alcohol use disorders identification test: guidelines for use in primary healthcare. WHO/MNH/DAT 89.4, Geneva (Switzerland): World Health Organization; 1989.
 24. Beck AT, Rush AJ, Shaw BF, et al. . Cognitive therapy of depression. New York (NY): Guilford Press; 1979.
 25. Beck AT, Steer RA. Manual for the Beck Depression Inventory. San Antonio (TX): Psychological Corporation; 1993.
 26. Kujanpää T, Jokelainen J, Auvinen J, et al. . Generalised anxiety disorder symptoms and utilisation of health care services. A cross-sectional study from the “Northern Finland 1966 Birth Cohort”. *Scand J Prim Health Care*. 2016;34:151–158. - [PMC](#) - [PubMed](#)
 27. Li Z, Li Y, Chen L, et al. . Prevalence of depression in patients with hypertension: A systematic review and meta-analysis. *Medicine (Baltimore)*. 2015;94:e1317. - [PMC](#) - [PubMed](#)
 28. Strine TW, Mokdad AH, Dube SR, et al. . The association of depression and anxiety with obesity and unhealthy behaviors among community-dwelling US adults. *Gen Hosp Psychiatry*. 2008;30:127–137. - [PubMed](#)
 29. Piwoński J, Piwońska A, Sygnowska E. o depressive symptoms adversely affect the lifestyle? Results of the WOBASZ study. *Kardiol Pol*. 2010;68:912–918. - [PubMed](#)
 30. Boden JM, Fergusson DM. Alcohol and depression. *Addiction*. 2011;106:906–914. - [PubMed](#)
 31. Mannan M, Mamun A, Doi S, et al. . Is there a bi-directional relationship between depression and obesity among adult men and women? Systematic review and biasadjusted meta- analysis. *Asian J Psychiatr*. 2016;21:51–66. - [PubMed](#)
