

Arterial Hypertension (High Blood Pressure) in Seniors

A Research Paper by the All4Smiles Research Team

May 2025

Abstract

High blood pressure, or arterial hypertension, is common in seniors and can lead to serious long-term issues like heart disease, stroke, and memory loss. Healthy habits like daily exercise and a balanced diet can help manage it, though that's often harder with age. Social and economic factors such as income, access to care, and emotional support also affect how well seniors can keep their blood pressure under control. Since high blood pressure is linked to cognitive decline, early treatment and preventive care are key to maintaining both physical and mental well-being.

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Effects of Long-Term Hypertension

By: Joyce Sato

The Long-Term Effects of Hypertension in Seniors

High blood pressure, widely referred to as hypertension, is a common issue in the elderly population. When not properly controlled, it can result in various serious health problems. This essay examines the long-term consequences of hypertension in seniors, highlighting its effects on heart health, kidney function, mental capabilities, and overall quality of life.

Cardiovascular Implications

Hypertension places excessive strain on the walls of arteries, causing them to thicken and become less flexible. Over time, this condition can lead to coronary artery disease, heart failure, and a higher likelihood of stroke. Research has indicated that high blood pressure is a major risk factor for both ischemic and hemorrhagic strokes in older adults. Furthermore, hypertension is linked to left ventricular hypertrophy, a state where the left ventricle of the heart thickens, which may eventually result in heart failure.

Renal Consequences

The kidneys are especially susceptible to the impacts of high blood pressure. Long-term hypertension can harm the blood vessels within the kidneys, hindering their capacity to filter

waste properly. This damage can advance to chronic kidney disease and, in extreme situations, may lead to end-stage renal disease, requiring dialysis or a kidney transplant.

Cognitive Decline and Dementia

High blood pressure in older adults is significantly associated with cognitive deterioration and a heightened risk of developing dementia. The underlying processes include harm to the brain's small blood vessels, which results in decreased blood flow to the brain and possible lesions in the white matter. Such alterations can negatively affect cognitive abilities, including memory, focus, and executive functioning. Moreover, research suggests that successfully controlling blood pressure in seniors may aid in maintaining cognitive abilities and lower the likelihood of dementia.

Quality of Life and Functional Impairment

In addition to the immediate health risks, high blood pressure can greatly impact a person's quality of life. The physical restrictions caused by heart and kidney problems can limit mobility and self-sufficiency. Moreover, the cognitive challenges linked to hypertension can make it hard to carry out everyday tasks, ultimately lowering overall life satisfaction.

The Role of Diet and Exercise in the Elderly

By: Sue Nguyen

As people grow older, staying healthy becomes more important but also challenging. Typically, individuals aged 65 and older often face physical changes including decreasing muscle mass, reduced bone density, stiff joints, and declining organ function. Aging can also lead to a higher risk of chronic diseases such as diabetes, cardiovascular disease, and dementia. However, research shows that two lifestyle factors, diet and exercise, can significantly influence the aging process and improve both physical and cognitive health outcomes. Although these changes are natural, they don't have to mean a loss of independence or quality of life.

A balanced and nutrient-rich diet supports the body's essential functions, helps manage existing health conditions, and lowers the risk of developing new ones. Carbohydrates, fats, proteins, vitamins, minerals, and water are nutrients that the body needs for proper function and growth. Good nutrition is more important as you age because it may help prevent diseases, such as osteoporosis, high blood pressure, heart disease, type 2 diabetes, and certain cancers. Older adults should eat foods that give lots of nutrients without extra calories such as vegetables and fruits. Empty calories should be avoided as well as foods that are high in cholesterol and fat. Staying hydrated is also crucial in addition to having a good diet.

Similarly, increased exercise levels is important for enhanced health and quality of life. It has been shown to help people of all ages. Exercise helps lower blood pressure, lower the risks of falls and serious injuries, and slow the body's loss of muscle and bone mass. You don't need an intense workout for exercise to be helpful. Instead, something as simple as a walk around the

park can be positive for the body and mind. Research also indicates that exercising for small periods that is spread out over the day is just as effective as exercising all at one time. Some great workout options for older adults are: yoga, pilates, aerobic exercise, and strength training. The CDC suggests 30 minutes of exercise five days a week.

The Influence of Socioeconomic and Psychosocial Factors on Hypertension Management in Seniors

By: Sri Patel

Hypertension is a very common condition in older individuals, and biological factors alone do not dominate it. Socioeconomic and psychosocial determinants—including income, education, access to medical care, social support, and mental health—also play essential roles in deciding whether or not older individuals are in the situation of being able to manage their blood pressure effectively. This paper investigates how these determinants are shaping the management of hypertension in the older population according to contemporary studies in healthcare, psychology, and social science.

Hypertension is prevalent in older adults and remains a key determinant of cardiovascular outcomes. There is pharmacological treatment, but also non-medical determinants such as socioeconomic status (SES), psychological health, and social environment (Centers for Disease Control and Prevention [CDC], 2023) play a role in controlling blood pressure. The current study investigates the determinants of control of the blood pressure of elderly individuals and suggests interventions that may enhance the management of elderly individuals.

Low-income older adults are also subject to increased barriers to the receipt of care and medication, which takes away from blood pressure control. Economic insecurity, the CDC (2023) reports, is associated with reduced healthcare utilization and medication adherence.

Similarly, health disparities in access to healthcare services, especially in rural or underserved settings, short-circuit potential for continued blood pressure monitoring and lifestyle therapy (Mayo Clinic, 2023).

Depending on a high level of educational status, health literacy is essential to the control of hypertension. Less educated patients can be unaware of roles in medication use or lifestyle modification. An example of how education tailored to the level of understanding among older adults can greatly enhance drug adherence and lifestyle adherence appears in Kim et al.'s (2017) study.

Social isolation is a predictor of health outcomes in older adults, as well as in the control of hypertension. Rutledge et al. (2013) determined that patients benefited by more supportive social networks exhibited better adherence to blood pressure management and medical checkup on a regular basis. Family, caregivers, and community-based health programs play an important role in providing support for elderly adults.

Anxiety and depression, common in older adults, have a direct influence on the prognosis of hypertension. Chronic stress causes elevated blood pressure via the hormonal mechanism, and mental disease suppresses treatment compliance. Spruill (2010) describes how stress management interventions can lead to improved control of hypertension in high-risk patients.

Beliefs and cultural practices also influence how the elderly view hypertension, and self-management. Well-designed interventions that are culturally attuned to variability and

internal motivation, writes Kronish and Davidson (2014), have been better at behavior change than traditional interventions for all.

Hypertension control in older persons is more than just a matter of pharmacology. Financial status, educational level, access to health care, social support, and mental status must all be addressed to maximize outcomes. Public health policy in the future must comprise community-based, culture-adjusted, and psychologically focused interventions for controlling hypertension among older persons.

The Relationship Between Cognitive Function and Hypertension in Seniors

By: Evelyn Yao

With increased healthcare resources comes increased lifespans and reduced elderly mortality rates. However, one issue with this is a marked increase in dementia cases globally. Dementia includes many types of neurological conditions characterized by a decline in memory and cognitive abilities. It has a significant disturbance in everyday life, and symptoms worsen over time. Thus, dementia presents a large challenge to the public healthcare system, which must counteract the growing number of dementia cases. Research proves that midlife hypertension is consistently linked to cognitive decline, mild cognitive impairment (MCI) and dementia, but more research needs to be done among older adults.

Hypertension, also called high blood pressure, is a condition where the force of blood against artery walls is consistently too high. It is often called the “silent killer” because it has no symptoms, yet causes premature deaths. Typically, a blood pressure reading of 140/90 mmHg or higher is considered too high. In fact, elevated blood pressure significantly contributes to cognitive decline over time. Recent research has discovered that hypertension is a pathogenic factor of cognitive impairment on vascular bases and Alzheimer’s disease. Among such vascular risk factors, chronic arterial hypertension is the main contributor to cognitive decline. Because the brain is one of the major organs targeted by hypertension, elevated blood pressure is one of the most concerning factors for cerebrovascular pathology leading to stroke and dementia.

Specifically, hypertension is associated with reduced abstract reasoning, a slowing of the mental processing speed, and memory deficits.

In terms of pathophysiology, the mechanisms which execute hypertension also involve damage to blood vessels in the brain, reduced blood flow, and damage to the blood-brain barrier. As a result, some consequences include brain atrophy, white matter lesions, and neuronal loss. Additionally, some of the diseases that the cognitive decline can be classified as are vascular dementia, Alzheimer's disease, and Lewy body dementia. Midlife hypertension in particular is especially concerning because of its crucial impact on cognitive function. It has long-term consequences on one's health yet often has no notable symptoms. Late-life hypertension has been a subject of debate, with some arguing that it accelerates cognitive decline, while others say that it actually has a protective effect on one's health. More research needs to be done before anything concrete can be claimed.

Ultimately, the relationship between cognitive function and arterial hypertension can not be overstated. Arterial hypertension is a significant contributor of cognitive decline and can lead to premature death as well as difficulty navigating daily life. The association between the two is even more pronounced as longevity rates heighten, because more seniors are at risk for cognitive decline due to an increased risk of hypertension. One can manage hypertension through lifestyle changes and certain medications, though more research needs to be done on if the medication is effective.

Treatment Options and Preventive Care for Arterial Hypertension

By: Aria Fernandes

Having Arterial hypertension increases the risk of stroke, cardiac disease, cardiac failure and more. The probability of developing arterial hypertension increases with age, with over 70% of older individuals experiencing this condition. It is important to be aware of how to handle the condition or know what steps forward can be taken to prevent it. These are some ways older adults can manage or prevent hypertension going forward:

Medications:

Diuretics (water pills)

- Diuretics increase urine production and filter excess sodium through urine.

Angiotensin-converting enzyme (ACE) inhibitors

- ACE inhibitors prevent the production of the enzyme angiotensin II, which narrows blood vessels and causes increased blood pressure.

Ex: Lisinopril (Prinivil, Zestril), Benazepril

Angiotensin II receptor blockers (ARB)

- ARB makes the enzyme angiotensin II unable to function efficiently

Ex: Azilsartan (Edarbi), Candesartan, Irbesartan

Calcium channel blockers (CCB)

- Prevents calcium from entering cardiac and artery cells. Calcium may make the heart work too hard/pump harder, causing blood pressure to rise.

Ex Amlodipine (Norvasc), Felodipine and Diltiazem

Other blockers/ secondary medications:

These medications may be prescribed to patients with specific lifestyles or needs

Alpha blockers

- These help lower nervous signals that narrow blood vessels

Alpha-beta blockers

- Slows heart rate and block the nerve signals that narrow blood vessels

Beta blockers

- These blockers dilate blood vessels and reduce heart rate

Renin inhibitors

- Slows the formation of the enzyme renin which elevates blood pressure. The use of Renin Inhibitors alongside ACE or ARB increases the risk of stroke in older populations, and should be avoided.

Vasodilators

- Vasodilators widen blood vessels by preventing muscles in artery walls from contracting. This prevents fluid buildup in the blood vessels.

Devices:

Home blood pressure monitors

Monitoring BP at home over time helps to detect hypertension in older adults and the effectiveness of treatments. Measurements with this device must be consistently done at the same time. If done inconsistently, readings may be

incorrect. Home BP monitors are great options for older adults who are unable to visit a medical facility frequently.

Self Management

Preventive measures/treatments that can be done without required external assistance.

Dieting/ Helpful foods

The DASH diet

Emphasizes eating fibrous foods, and reduces the amount of foods that have high amounts of saturated fats and sodium intake. Fiber helps keep arteries clear and aids in digestion.

Foods that contain Potassium, Calcium, and Magnesium

Potassium- Apricots, Bananas

Calcium- Kale, Winter squash

Magnesium- Spinach, Avocado

Fibrous foods

Fiber regulates the body's use of sugar, and lowers the risk of cardiovascular disease.

Exercise

Aerobic and flexibility exercises

-Aerobic exercises include repetitive movement to increase heart rate and oxygen usage. Consistent aerobic exercise will enhance one's high density lipoproteins

(HDL) which reduces plaque buildup in the arteries. It is recommended 150 min of moderate aerobic activity per week.

Exercises include: walking, jogging, cardio classes

-Flexibility exercises consist of balance and coordination. Doing at least 25 minutes of passive leg stretches three days a week is linked to the improvement of blood vessel health and increased blood flow

Exercises include: yoga, passive leg stretches

Foods to avoid

High fat foods

- Foods that contain high fat such as red meat, dairy products, and fried food, can be detrimental to arterial health. Foods with high amounts of fat can cause the buildup of plaque in the arteries. If consumed with refined carbohydrates such as potato chips, cereal and other processed grains, the effects of the fats become worse.

High sodium foods

- Sodium can elevate blood pressure by causing the blood to retain extra fluid. Drinking at least 12 8 oz glasses of water per day can help the body to excrete excess sodium faster.

Foods high in fructose

- Fructose is also known as fruit sugar and is found to increase sodium reabsorption.

Having arterial hypertension may cause concerns, and might appear to be difficult to manage, however, following the above lifestyle alterations can significantly reduce the risk of the condition being fatal. In fact, around 27% of older individuals are able to successfully manage their high blood pressure and maintain their health. Despite the many choices that are offered, it is important to understand what lifestyle and medication choices will work best for each individual.

Polypharmacy and Hypertension: The Risks of Multiple Medications in Seniors

By: Hiya Patel

Hypertension is very prevalent among older adults, and managing this condition often requires long-term medication. However, many seniors take multiple additional medications to manage not just hypertension, but other chronic diseases such as diabetes and arthritis. This usage of numerous pharmacological treatments to treat multiple chronic conditions is known as polypharmacy. Polypharmacy, commonly defined as the simultaneous usage of five or more medications to treat multiple coexisting chronic health conditions, has negative impacts that are a matter of growing concern among older adults. While convenient, polypharmacy has its downsides, as increased medication exacerbates the risk of adverse drug reactions (ADRs), leading to a reduced quality of life, increased number of hospitalizations, and higher mortality rates (Maher, Hanlon, & Hajjar, 2014).

Risks of Polypharmacy in Seniors with Hypertension

Managing hypertension in older adults through polypharmacy, specifically through the use of the “triple whammy” of hypertension treatment, including either angiotensin-converting-enzyme (ACE) inhibitors or angiotensin II receptor blockers (ARBs), diuretics, and non-steroidal anti-inflammatory drugs (NSAIDs) negatively impact kidney function, possibly leading to acute kidney injury. Thus, the use of polypharmacy to treat hypertension in seniors can cause severe health issues, negatively impacting their health and

quality of life (*Avoiding the Triple Whammy in Primary Care: An ACE Inhibitor/ARB + a Diuretic + a NSAID - Bpacnz*, 2018).

Older adults on medications for hypertension may experience Orthostatic Hypotension, which is a sudden drop in their blood pressure when they stand up. The combined usage of multiple antihypertensive drugs can lead to worse orthostatic hypotension, causing seniors to be at a greater risk of getting dizzy and losing balance upon standing up, possibly leading to injury (Cleveland Clinic, 2022).

While using prescription drugs to manage hypertension may be necessary to preserve the health of older adults, the risks associated with polypharmacy, especially in seniors, cannot be ignored. The potential for ADRs, kidney complications, and increased risk of injury due to orthostatic hypertension highlight the importance of being cautious when prescribing multiple drugs together. A more individualized and wellness-focused approach to treating hypertension in older adults, as well as the consideration of non-pharmaceutical treatments alongside conventional medications, can help mitigate the dangers of polypharmacy and improve health outcomes for elderly patients managing hypertension.

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