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Influence of unhealthy diet on hypertension

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Abstract

In this review, summarize current evidence regarding the role of occupational factor unhealthy dietary pattern in hypertension. Numerous variables in a healthy lifestyle are advised for the prevention and management of hypertension. Many articles were chosen based on their fit with the current review aims after a thorough search of all resources on the issue was conducted using the different search engine. It has been shown that eating patterns like the healthy diet and nutritional methods to treat hypertension. Patients who has overweight have a higher mortality risk of hypertension. The implementation of healthy lifestyle choices such as participating in physical activity for at least 4 days per week, decreasing weight. Many nutrients like sodium, potassium, calcium, magnesium, fish oil and fibre plays important role in hypertension. When adopting a diet that is high in fruits, vegetables, and in salt, avoiding alcohol consumption, and quitting smoking helps prevent or control hypertension.

Keywords: Working population, hypertension, dietary pattern, healthy food, unhealthy food

Introduction

Recent research has found that hypertension is the main reason in 10 million death per year, providing a major contribution to the burden of disease and mortality globally [1]. Additionally, primary prevention would considerably benefit public health given the condition's increased incidence [2]. Most significant risk factors that can be changed for hypertension have been identified as being overweight, unhealthy diet (specifically eating too much salt), alcohol use, and insufficient physical activity [3]. Through the adoption of healthy lifestyle habits and dietary changes, such as involving in

physical activity for at least 4 days a week, trying to lose when obese, eating consuming lots of good fruits and veggies while limiting salt, avoiding binge drinking, and avoiding smoking, early treatment can lower blood pressure [4]. The Joint National Committee describes hypertension as having a systolic and diastolic blood pressure of 140 mmHg and 90 mmHg or higher. The working population's hypertension can be decreased or controlled with the use of regular nutritional analyses, stress-reduction techniques, and consistent sleep schedules [5]. According to assessments, high blood pressure was a major contributor in 62% of cerebrovascular illness and 49% of ischemic heart disease worldwide [6].

The health and wellbeing to years life with a disability worldwide is hypertension, which is the leading risk of heart disease element (CVD). Renal dysfunction, end-stage kidney disease, and alzheimer caused on by chronic kidney disease are all significantly impacted by hypertension [7-12].

If blood pressure is in the pre-hypertensive stage (Systolic blood pressure 120-139 mmHg and/or Diastolic blood pressure 80-89 mmHg) or level I hypertension (Systolic blood pressure 140-159 mmHg and/or Diastolic blood pressure 90-99 mmHg), changing dietary components like sodium, potassium, calcium, magnesium, soluble and insoluble dietary, and fish oil offers an important strategy to control blood pressure. Researchers have been analysing the relative impact of each for many years, as well as how these dietary components affect blood pressure individually or in combination. In an attempt to determine whether particular dietary changes were helpful in treating hypertension, In 1992, the National Institutes of Health (NIH) launched funding various research initiatives. The only diet which has been proved to control systolic blood pressure by 6 to 11 mm Hg is the DASH diet. When associated with a healthy lifestyle, DASH has occasionally been suggested as a primary pharmacological therapy [13].

In this article, both the general eating habits and the specific nutritional components will be discussed.

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2. Methods and Materials

A thorough analysis of the topic was done on a number of search engines, including PubMed and Google Scholar. The review included significant recent research articles on hypertension. Initially, 55 papers related to the topic of the current study were searched.

Based on how well the selected publications matched the review's title, a total of 49 articles were chosen and reviewed. An unhealthy eating pattern all mentioned as search terms in the title. [fig.1].

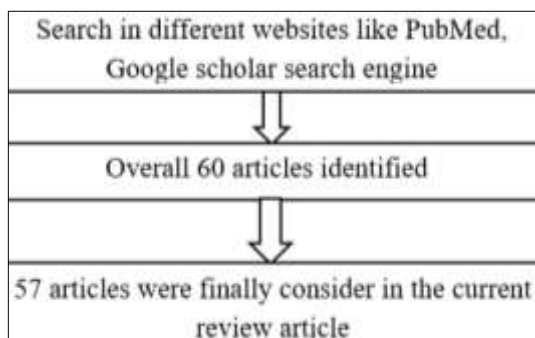


Fig 1: Analysis of the topic of the current study were searched

3. Role of various nutrients in hypertension

3.1. Sodium

It has been debated for years whether eating too much salt causes blood pressure to fluctuate. Hypertension is more prevalent in societies where the average daily intake of sodium chloride is greater than 100 mmol and rare in societies where the average daily intake is less than 50 mmol [14].

All people require salt, an important nutrient that is part of their diet. Hypertension, however, is a result of excessive salt consumption [31, 32]. Numerous studies have shown that even a little reduction in sodium intake could avert hundreds of hypertension-related deaths each year, including heart attacks and strokes [15].

Hence, lowering your salt intake in moderation can decrease your blood pressure. Several professional organisations highly advise dietary salt reduction for the management and prevention of hypertension and, just as result, cardiovascular morbidity and mortality as a change in lifestyle habit. [16-18].

Reducing dietary salt consumption from the recommended amount of less than 5-6 g/day to the total daily intake of 9-12 g can significantly improve both global health and major healthcare. [19].

Different amounts of salt were consumed by participants sodium experiment during the study. The DASH diet consists low quantities of total and saturated fat and is rich in fruit and vegetables, low-fat milk products, and other plant-based foods. Based on the study, sodium restriction significantly lowered total SBP and DBP as well as age-related rise in blood pressure. Significant blood pressure declines were achieved with both the DASH diet and sodium restriction, though the combined result was better. [20, 21].

50–60% of hypertensives are reported to be salt sensitive [21]. Daily sodium consumption should be limited to less than 2000 mg and less than 1500 mg 3800 mg, as recommended by the WHO and AHA. Food rich in sodium are vegetables like tomato sauce, fruit, cheese cottage, nuts and so forth. It is best to obtain sodium from natural sources [22].

3.2. Potassium

Numerous studies have examined the correlation between potassium and blood pressure. Patients who increased their daily potassium intake by 1000 mg reported decreases in SBP and DBP of 0.9 and 0.8 mmHg, respectively. According to a study by Krishna and Kapoor, potassium deprivation causes an increase in Systolic of 7 mmHg, a drop in Diastolic of 6 mmHg, a reduction in secretion, and a decline in plasma aldosterone levels were also noted. [23].

In many nations, the normal dietary potassium intake is actually considerably below what is advised. According to a third NHANES study data from 1988 to 1994, adults' calculated mean potassium consumption varied from 2200 to 2400 mg for women and 2900 to 3300 mg for men. [22].

Less than 2% of adults and approximately 5% of men in the USA fulfilled the requirements for k consumption (i.e., at least 4700 mg/day), as per NHANES data from 2003 to 2008, the specified timeframe during which the afore mentioned guidelines were published [24].

Urban regions, people consumed 1950 mg of potassium daily, but in rural areas, it was 1830 mg [25].

The link between salt and potassium intake and deaths among US adults was examined by researchers using information from the third NHANES. They reported that increased potassium intake appeared to be connected with a decrease in mortality while higher sodium intake was linked to a rise in all-cause mortality. Body mass index (BMI), sex, age, hypertension, physical activity, and BMI have no bearing on this outcome [34].

An increase in potassium intake of 10 mmol per day was linked to a 12-year progressive analysis's 40% lower risk of stroke mortality. [64]. Increasing potassium intake is expected to lower the incidence of CVD events, and multiple studies have demonstrated an antagonistic relationship between potassium intake and stroke as well as other kinds of CVD [35].

Based on the evidence now available, The Institute for Medical Research determined that an appropriate daily potassium consumption for all persons is 4700 mg (120 mmol) [36].

Sources of potassium contain nuts, milk products, fruit and vegetables, and other meals. It is best to get potassium from natural sources. Currently, it is not advised to take pharmacological potassium supplements in order to meet the necessary daily consumption of potassium.

3.3. Calcium

Numerous studies have discovered a link between hypertension and calcium intake that is harmful is difficult to isolate in large part because of how other nutrients in diets interact with it. [37].

Two meta-analyses investigated the connection between dietary calcium intake and hypertension. The authors found a modest drop in SBP (1-2 mmHg), however the results for DBP were hardly detectable and insignificant. [38, 39].

Since there is currently no research to show the advantages using calcium intake to treat or prevent bp, it is not required to increase calcium consumption above the daily recommended intake of 1000–1300 mg. Numerous studies have shown that increasing calcium consumption lowers blood pressure, even in people whose blood pressure is within the normal range. It is also thought that a decrease in blood pressure is a mediator of the beneficial benefits of increasing

calcium consumption on pregnancies. It is well known that even modest drops in hypertension substantially lowers the chance of passing die, suffering a brain hemorrhage, and developing coronary artery disease. A significant risk factor for mortality has been found as high blood pressure [26].

The majority of calcium-rich foods are dairy items, ideally those with minimal fat, including milk, cheese, and yoghurt.

3.4. Magnesium

In individual investigations, a magnesium deficiency has been linked to high blood pressure [27, 28].

The significance of magnesium deficiency (MgD) as a risk factor is not entirely understood, despite the fact that there is a great deal of knowledge about this socially significant condition [29].

Furthermore, whether magnesium is therapeutically beneficial in the management of hypertension is unknown. The majority of research show a negative correlation between magnesium levels in the body and blood pressure, as well as hypotensive and hypertensive effects of dietary magnesium deficit and supplementation. This shows that a lack of magnesium may contribute to the development of hypertension [30].

A high-magnesium diet (at least 500–1000 mg per day) reduces blood pressure, according to epidemiologic, observational, and clinical trial data; however, the outcomes are mixed. [31-33]. The population being studied, the length of the trial, the administration of additional essential nutrients, magnesium kind and intake, heart rate level prior to therapy, compliance assessment, use of multiple experiments of blood mg, intracellular magnesium, or 24-hour total magnesium output, may all be contributing factors to the inconsistent results. A detrimental correlation between dietary magnesium consumption and blood pressure has been found by the majority of epidemiologic studies [40, 41].

500 to 1000 milligrams of mg per day will lower BP by 5.6 to 2.8 mm Hg. These study found that magnesium and hypertension have a regular but complex correlation. The current recommendation for managing hypertension is magnesium supplementation [42].

Plant foods that contain magnesium include legumes, leafy green vegetables, nuts, seeds, whole grains, and cereals with added nutrients. Additionally, it can be found in chicken, fish, and pork.

3.5. Caffeine

Coffee, tea, soda, and a variety of energy beverages all contain caffeine. It is the main ingredient in stimulant drinks. Caffeine can temporarily raise blood pressure in non-habitual users, but it has little to no effect on regular coffee drinkers. Based on the information available, chronic coffee consumers with hypertension might not need to change their behaviour. However, it might be dangerous for sporadic coffee consumers [43].

To prevent stress and boost psychological responsiveness, caffeine can also be pharmaceutically synthesised and added to food, non-alcoholic beverages, energy drinks, or commercial preparations. The negative effects of caffeine typically appear after consuming high doses and include tachycardia, anxiety, restlessness, mood swings, sleeplessness, psycho-motor agitation, and alterations in mental process. Toxic effects start to show up at dosages of 1.2 g or more (more than 20 cups), whereas the deadly dose is thought to be above 10 g (75–100 cups of coffee consumed

quickly) [44].

There is proof that coffee's stimulating impact on blood pressure may be caused by a substance other than caffeine. People who drink decaffeinated coffee have been shown to have elevated blood pressure [45].

3.5.1 Coffee

The impact of caffeine drinking on hypertension and the risk of getting the condition are widely debated because arterial hypertension affects 31.1% of the world's population. There has also been a lot of debate about whether or not coffee is safe for people with high blood pressure. Regular, moderate coffee use is not more likely to cause harmful action and may even decrease it, according to numerous studies and meta-analyses. Contrarily, occasionally consuming coffee can cause hypertension. Frequent, moderate coffee use does not seem to raise the risk of abnormally high blood pressure in hypertensive individuals and may even lower the chance of death from any cause. Most people, even those with high blood pressure, don't notice any negative effects from regularly consuming one to 3 caffeine. [46].

3.6. Omega-3 Polyunsaturated Fatty Acid (Fish Oil)

The importance of essential fatty acids to health, particularly cardiovascular health, has long been theorised. Daily fish consumption has been shown to reduce blood pressure [47].

Numerous studies have shown that fish oil, also referred to as enhanced polyunsaturated omega-3 fatty acids have been shown to reduce blood pressure. Given that it was not noticed in patients who routinely ingested fish three times or more per week or in those whose baseline plasma phospholipid omega-3 fatty acid concentrations were higher than 175.1 mg/L, this effect may have a dosage limit [48].

Numerous studies show that persons who use fish oil supplements experience mild reductions in blood pressure. [49, 50].

High concentrations of the chemical element mercury may be present in the bodies of fish living in contaminated water. Numerous cross-sectional investigations have suggested that mercury may increase blood pressure. There is currently no indication that methyl mercury affects the chance of incident hypertension developing, according to two recent research with a huge representative sample that include 6045 US men and women [51]. Numerous studies have looked at the effects of fish oil (omega-3 fatty acid, one of the key essential fatty acids), on individuals with and without hypertension or hypercholesterolemia [52].

There aren't many negative effects associated with fish oil, and they're all dose related. These include gastrointestinal discomfort, a fishy aftertaste, and very rarely, clinical bleeding. Further research on the utilization of fatty acids into hypertension is required to better understand the recommended dosage and its benefits, especially as people age [53].

3.7. Alcohol

Heavy drinking, which is commonly defined as any alcohol consumption over the moderate range, is dose-dependently associated with an rise a risk of bp. In the USA, a normal beverage contains 14 g (6 oz) of pure alcohol [54].

The American Heart Association advises against exceeding the recommended daily limit of Men are allowed two servings, but women and people who are lower are allowed

one. ^[55].

According to the INTERSALT research, males who used 300-499 mL of alcohol per week had SBP/DBP readings that have been, on general, 2.7/1.6 mmHg greater than those who did not. Women who consumed at least 300 mL each week had blood pressure that was 3.9/3.1 mmHg higher than that of non-drinkers. When alcohol consumption is reduced, hypertension is observed to drop. Strong evidence supports the recommendation of moderate alcohol consumption as a component of hypertension treatment. 14 g of low-dose alcohol consumed within six hours had no effect on blood pressure ^[53].

3.8. Fiber

Fibre, a component of foods made from plants, cannot be digested. Observational studies have repeatedly shown that higher fibre intake (by 7–15 g/day over usual levels) is strongly linked with a reduced risk of hypertension, in contrast to the low fibre consumption in Western diets. Consuming fibre was discovered significantly related with lower blood systolic and diastolic bp in the 2,909 normal individuals between it ages of 18 and 30 who participated in the Coronary Artery Risk Development in Young Adults Research. Blood pressure is frequently lowered more efficiently by high viscosity, soluble fibre sources like -glucan than by insoluble fibre sources (e.g., wheat bran). It is unclear exactly how fibre may impact blood pressure. It has been proven that eating fibre and blood pressure go hand in hand. DBP and SBP were decreased by 1.26 and 1.13 millimetres, respectively, with an additional 11.5 grammes of fibre per day (95% confidence interval: 2.49 to 0.23 millimetres) (2.04 to 0.48 millimetres). People over 40 and those who have hypertension are typically more vulnerable ^[56].

Individuals in the (CARDIA) Research showed a significant connection between fibre intakes and reduced systolic and diastolic blood pressure, but not black ones. Participants from all racial and ethnic groups were included in the study, which involved 2,909 healthy people between the ages of 18 and 30 ^[57].

The American Heart Association's scientific statement from 2006 states that there is inadequate data to claim that increasing dietary fibre consumption alone can lower blood pressure ^[55].

Conclusion

It is conclude that, higher intakes of unhealthy foods, such sports drinks, and lower intakes of nutritionally foods lead to hypertension. Changing one's diet has a key therapeutic role to play in controlling blood pressure. The risk of hypertension can be decreased by the working population adopting healthy dietary habits. The healthy lifestyle choices suggested in the prevention and treatment guidelines for the condition should help to reduce the number of new instances of hypertension [such as DASH diet]. The risk of death among older persons with hypertension was shown to be similar over a wide range of BMIs. Low BMI decreases the risk of hypertension. Increasing physical activity, decreasing weight, and improving diet appear to be effective and promising treatments to induce clinically greater decrease in work and mobility BP independent of changes in body weight.

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