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EDITORIAL

Dietary and lifestyle factors in hypertension

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Population-based studies have identified a range of risk factors that contribute to incident cardiovascular disease events, and hypertension is one of the most common among them.[1] Worldwide, hypertension is a leading cause of premature death.[2] Approximately one-quarter to one-third of the world's adult population are estimated to have hypertension, with the prevalence being approximately one billion, which is projected to increase.[3] The anticipated increase in hypertension globally is attributed to increasing age as well as the availability and intake of a Westernized diet and adoption of a sedentary lifestyle leading to obesity.[3,4] The higher risk of hypertension associated with unhealthy dietary and lifestyle factors highlights the importance of environmental factors in hypertension onset and progression.

A multitude of randomized clinical trials have shown that reducing blood pressure with antihypertensive medication improves cardiovascular disease event-free survival among patients with hypertension.[5] While antihypertensive medication is a mainstay of therapy for patients with hypertension, improving diet and lifestyle is also an essential component of hypertension management.[6–8] Adoption of a healthy diet and lifestyle is important for preventing hypertension among individuals who are free of hypertension, and has a central role in improved blood pressure control among patients with hypertension.[6–8] For patients with hypertension, dietary and lifestyle interventions are commonly recommended as an initial strategy or as an adjunct to antihypertensive medication to control blood pressure and improve the cardiovascular risk profile.[8–10]

Diets based on the Dietary Approaches to Stop Hypertension (DASH) are often recommended.[6,8] The DASH-type diet is characterized by a diet rich in fruits, vegetables and low-fat dairy products, along with a reduction in saturated and total fat. In the past, reduced salt intake has been recommended for hypertension prevention and management.[6,8,9] Although there is sufficient evidence that links dietary salt intake to blood pressure, several contradictory studies have recently been published,[11–13] which have added controversy as to whether an association exists between salt intake and blood pressure, whether lower salt intake leads to a reduction in cardiovascular events and death, and what the 'ideal' level of salt intake is for reducing blood pressure, cardiovascular events and death.[14,15] Some experts also recommend increasing the intake of potassium as greater potassium intake is associated with a lower blood pressure.[6] Although the ideal potassium intake is unclear, an intake of 4.7 g per day, which is equivalent to 120 mmol per day, has been recommended.[6] Alcohol consumption, if consumed, should be limited to $\leqslant 2$ alcoholic drinks a day for men and $\leqslant 1$ alcoholic drink a day for women.[8] One alcoholic drink is defined as 12 ounces of regular beer, 5 ounces of wine or 1.5 ounces of 80-proof distilled spirits.[6,8]

In addition to these dietary factors, maintaining a healthy body weight is recommended due to its beneficial effects on blood pressure and also cardiovascular disease risk. Obesity is a major problem in developed and developing countries.[8–10] In the United States, approximately two-thirds of adults are overweight (that is, body mass index $\geqslant 25$ kg m^{-2} and < 30 kg m^{-2}) or obese (that is, body mass index $\geqslant 30$ kg m^{-2}).[6,16] Several randomized trials have demonstrated that weight loss leads to reductions in blood pressure.[17] Hypertension guidelines also recommend engaging in regular physical activity and aerobic exercise. One of the earliest observational studies showed that exercising more than 5 h per week was associated with a lower risk of incident hypertension.[18] Likewise, one of the first trials demonstrated that an aerobic interval training programme 2 days per week led to reductions in blood pressure in hypertensive and normotensive men.[19] A multitude of studies have subsequently shown that increased physical activity and aerobic exercise have protective effects on blood pressure.[20] A major challenge, of course, is the successful adherence to and maintenance of a healthy diet and lifestyle in an individual over the long term.

In addition to the aforementioned 'traditional' strategies for blood pressure control, several complementary and alternative approaches have been tested, including psychosocial and behavioural therapies, including mind-body interventions, intake of other dietary factors, and herbal remedies or supplements.[21] The use of these complementary and alternative approaches is popular among patients with various diseases.[22] There is accumulating but limited evidence that these non-traditional approaches reduce blood pressure.[21] Mind-body interventions have potential benefits given that psychosocial stress may be associated with hypertension onset and severity.[23] It is ironic that the word 'tension' is part of the word 'hypertension' as many patients consider nervousness and tension to be part of the hypertensive disease process.[24]

Given the role of dietary, lifestyle and alternative factors in the risk of hypertension and blood pressure control, this special issue of the *Journal of Human Hypertension* primarily focuses on dietary and lifestyle factors, and complementary and alternative approaches to hypertension. The selected studies in this special issue examined the association of different dietary components (that is, fruits, vegetables, nuts, yeast extract, seasonings and so on) with blood pressure. Further, the contributions of lifestyle factors including obesity, physical activity, aerobic exercise, alcohol use, as well as the effects of complementary and alternative therapies including yoga, ginseng, and red beet ingestion on blood pressure and hypertension-related biomarkers (that is, endothelial function, inflammation and arterial stiffness) were also examined in some of these studies.

These studies ranged from having a cross-sectional, prospective cohort to a randomized controlled trial design. The studies also conducted systematic reviews and meta-analyses of the literature to examine proposed effects. Overall, the results of these important studies inform whether these non-pharmacologic approaches to hypertension have important clinical effects on blood pressure, and also help identify the mechanistic pathways through which these approaches may positively affect hypertension onset and progression.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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