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LIFESTYLE AND HYPERTENSION

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ABSTRACT

Hypertension (HTN) is fast emerging as a modern epidemic in the world. It is the leading and most important modifiable risk factor for heart diseases, stroke, renal diseases and retinopathy**.** Appropriate lifestyle changes are the cornerstone for the prevention of hypertension. It can be prevented by simply adopting a healthy lifestyle. Lifestyle measures that have been shown to be capable of reducing blood pressure include: (i) salt restriction, (ii) Diet, (iii) moderation of alcohol consumption, (iv) stopping smoking, (v) weight reduction and maintenance, (vi) regular physical exercise and (vii) stress. This review article investigates the role of lifestyle modification in preventing hypertension.

Keywords: Hypertension; Salt; Diet; Weight Reduction; Stress; Smoking; Alcohol; Physical Activity

INTRODUCTION

Hypertension (HTN) is the most common cardiovascular disorder posing a major public health challenge to societies in socio economic and epidemiological transition. Appropriate lifestyle changes are the cornerstone for the prevention of hypertension. They are also important for its treatment; although they should never delay the initiation of drug therapy in patients at a high level of risk. Developed countries are considering it as a leading cause of death but even developing countries do not lag behind in being affected by it. Lack of knowledge about the morbidity, complications and the method of control of hypertension contributes to a large percentage of undetected and untreated hypertensive subjects in the community. High blood pressure is often called the "Silent Killer". In early stages of high blood pressure, there are no symptoms. Many who are afflicted feel no discomfort until a medical crisis like a heart attack, the rupture of a blood vessel in the brain or a stroke strikes. It is likely to reduce the life span by 10-20 years (Kulkarni 1998). Once hypertension is diagnosed, treatment involves a combination of antihypertensive medication and life style modification which is the first line of intervention for all patients with hypertension (Lemone and Burke 2008). It is possible to prevent the development of hypertension and to lower blood pressure levels by simply adopting a healthy lifestyle. The recommended lifestyle measures that have been shown to be capable of reducing blood pressure include: salt restriction, moderation of alcohol consumption, high consumption of vegetables and fruits and low-fat and other types of diet, weight reduction and maintenance and regular physical exercise. In addition, insistence on cessation of smoking should be part of any comprehensive lifestyle modification plan to reduce the risk of

high blood pressure and cardiovascular disease (Appel LJ 2003; Wexler R and Aukerman G 2006).

Salt Restriction

Excess salt intake is a major contributor to high blood pressure, the leading individual risk factor for death and disease burden worldwide (Lim *et al* 2012). Globally each year, 1.65 million cardiovascular-related deaths are caused by people consuming too much salt (Mozaffarian *et al* 2014). There is strong evidence for the efficacy of reducing salt intake to lower blood pressure (BP) (He *et al* 2013) and the subsequent impact on cardiovascular disease (Lewington *et al* 2002). Population salt reduction has been identified as one of the top five priority interventions to prevent non-communicable diseases (NCDs) based on parameters such as health effects, cost effectiveness, low implementation costs and political and financial feasibility (Beaglehole *et al* 2011). In 2013, reducing salt intake by 30% was one of nine global targets endorsed by all World Health Organization (WHO) Member States to reduce NCDs (WHO 2013). Sodium chloride is the most abundant naturally occurring salt in food. However, the largest quantities of salt now consumed originate from industry processed food. Only 20% to 30% of total dietary sodium consumption is discretionary-or consumer controlled-through the addition of salt to food after its preparation. The rest is derived from naturally occurring sources or commercial processes (Egan *et al* 2003). **Radhika *et al* (2007) concluded that** intake of dietary salt in urban South India was higher than currently recommended. Increasing salt intake was associated with increased risk for hypertension even after adjusting for potential confounders.

Diet

Diet is thought to play a significant role in CVD risk but evidence regarding its use is not clear, nor are the guidelines overwhelmingly consensual. The AHA recommend the Dietary Approaches to Stop Hypertension (DASH) diet which is low in sugars and saturated fats, high in vegetables, fruits and whole grains. This has been shown to as a method to lower blood pressure (BP) and low-density lipoprotein cholesterol (LDL-C) which are independent risk factors for CVD, but they do not attempt to show a direct reduction in CVD risk. (Eckel et al 2013). According to a study by Folsom *et al (*2007) on 20,993 women of age group 55 to 69 years, revealed that no woman had perfect concordance with the DASH diet. Adjusted for age and energy intake, incidence of hypertension was inversely associated with the degree of concordance with the DASH diet, with hazard ratios across quintiles of 1.0, 0.91, 0.95, 0.99, and 0.87 (p = 0.02). It suggested that greater concordance with DASH guidelines did not have an independent long-term association with hypertension or cardiovascular mortality in this cohort. This implies that very high concordance, as achieved in the DASH trials, may be necessary to achieve any benefits of the DASH diet.

The ESC recommends switching from saturated to polyunsaturated fatty acids, an increase in fibre, fruit, vegetable and fish intake as well as abstinence from alcohol and adherence to a Mediterranean type diet. These have all been shown to offer significant reductions in CVD risk (Piepoli *et al* 2016). There is also clear evidence that industrially produced transfats are causally linked to CHD (De Souza *et al* 2015) and these are specifically proscribed in ESC and NICE guidelines. **Payab *et al (*2015)** concluded that **junk food consumption increased the risk of both general and abdominal obesity.** Study done by Guddad *et al* (2012) on 100 hypertensive subjects of more than 46 years of age revealed that more number of i.e. 78 subjects were consuming vegetarian diet (78%) and relatively low proportion i.e. 22 subjects were non-vegetarians (22%). Rouse *et al (*1983)

have reported that blood pressure of vegetarians was lower than that of non vegetarians. In summary, there does seem to be good evidence for recommending diets high in fibre, fruit and vegetable intake and low in simple sugars and salt. Adherence to a such diet also appears to be cardioprotective.

Alcohol

Alcohol consumption is a controversial subject given the known sequelae of regular and excess alcohol use. Studies suggest that reductions in alcohol intake, even for moderate drinkers, are associated with a reduction in CVD risk. It is on this basis that the ESC guidelines recommend no safe level of alcohol intake (Piepoli *et al* 2016). NICE guidelines were produced prior to this data being released and continue with advice on moderate intake, advising not more than four units per day for men and three for women, despite these being arbitrary figures (NICE 2016). The ACC also advise moderation along the same lines, with one to two drinks per day for men, and one drink per day for women (Garcia 2015). As yet there does not seem to be a consensus of opinion regarding safe levels, but high levels are evidently deleterious.

Stopping Smoking

Stopping smoking is the single most cost-effective intervention in CVD prevention, and some benefits are seen within months of cessation. (Piepoli *et al* 2016). Smoking has long been known as the major risk factor for CVD (Unal 2004). European data indicate that smoking doubles the 10 year CVD mortality rate (Perk *et al* 2012) whilst 30% of US CVD mortality is attributable to smoking (Eckel et al 2013). Not only is it deleterious but this effect is dose related with no safe lower limit seen (Law and Wald 2003). All guidelines recommend cessation, with short and long-term benefits seen irrespective of length or intensity of smoking habit. E-Cigarettes are still controversial with regards to CVD risk. Whilst the reduction in toxic products within cigarette smoke is undoubtedly beneficial, animal models of nicotine exposure still display CVD effects with increased atherosclerotic plaques found in mice models (Bhatnagar 2016). Long-term data are awaited to determine the effect upon humans.

Weight Reduction and Maintenance

Having a body mass index (BMI) > 25 is a risk factor for CVD with lowest all-cause mortality seen at BMI 20–25 but, due to increased all-cause mortality with BMI < 20, reductions below this level are not routinely recommended (Khosravi *et al* 2012). In developing countries undergoing health or epidemiological transition, a complex picture relating to nutritional status of the population is frequently found. In 1997, the World Health Organization emphasized that obesity is becoming a major health problem in many developing countries, particularly in adult women (Opie and Seedat 2005). **Stevens *et al* (2001) concluded that clinically significant long term reductions in blood pressure and reduced risk for hypertension can be achieved with even modest weight loss.** No guidelines recommend specific intervention regarding weight, but advise maintenance of a healthy weight for reduction of CVD risk. BMI is a good predictor of CVD risk, particularly at higher levels, but there is good evidence that, at all levels of BMI, visceral adiposity and liver fat are significant drivers of risk (Despres *et al* 2012). This helps to explain the heterogeneity in the CVD risk profile seen in the overweight as it varies depending on the location of adipose deposition. There are moves to suggest that, alongside reduction in BMI, reduction in waist circumference as a proxy for reductions in visceral fat should become an important target for amelioration of CVD risk.

Physical Exercise

Exercise is universally recognised as having a positive impact on the majority of health

outcomes and its effect on CVD is no different. Mortality and morbidity directly due to exercise remains minimal even up to very intense levels of exercise and in the overwhelming majority the benefits outweigh the risks (Marijon *et al* 2011). NICE recommend 150 minutes of moderate intensity aerobic activity per week, or 75 minutes of vigorous aerobic activity. This can be defined either subjectively or in terms of relative changes in metabolic rate. They also advise muscle strengthening activities on two or more days per week (NICE 2016). An increased level of physical activity can lower BP, independent of concomitant changes in weight. A recent meta-analysis of 27 randomized trials documented a 4 mmHg net reduction in systolic BP among individuals assigned to an aerobic exercise intervention (Kaplan *et al* 1997). A study was done by **Hu *et al*** (2004) on 8302 men and 9139 women of age group 25 to 64 years, with a followup of 11 years, having no history of antihypertensive drug use, coronary heart disease, stroke, and heart failure at baseline (1600 incident cases of drug-treated hypertension). It was concluded that regular physical activity and weight control could reduce the risk of hypertension and there was equal protective effect of physical activity in both sexes regardless of the level of obesity.

Stress

In a study by Matthews *et al (*2007) on 4100 normotensive black and white men and women of age 18 to 30 years, with a follow-up period of 13 years. BP responses to 3 psychological challenges—cold pressor, star tracing, and video game tasks—were measured. It was observed that the larger the BP responses were to each of the 3 tasks, the earlier hypertension occurred. The systolic BP effect for the cold pressor task was apparent for women and for whites in race- and gender-specific models, whereas the diastolic BP effect for the video game was apparent for men. Young adults who show a large BP response to psychological stress may be at risk for hypertension as they approach mid life.

Lifestyle Modifications

Lifestyle modification is considered the current challenge to control blood pressure. Wehedy *et al* (2014) analysed that modifications in all dimensions of lifestyle patterns showed significant improvement in the study group compared with the control group. The improvement in the control group may be justified by obtaining information about healthy diet from their health care providers or from the mass media such as magazines, television, and newspapers. Lifestyle modifications included eating healthy diet, physical activity as walking and proper stress management. The knowledge acquisition during the sessions played an essential role in motivating the older adults in adopting healthy lifestyle. Similar findings were reported by Soliman (2007) and Weheida *et al* (2009) in Egypt, who found marked improvement in adopting healthy behaviours after implementing educational program among studied hypertensive patients. Viera *et al* (2010)found a significant mean weight reduction and an increase in physical activity among males and females who participated in a 15-month lifestyle intervention compared to the control group.

It is possible to prevent the development of hypertension and to lower blood pressure levels by simply adopting a healthy lifestyle (Midgley *et al* 1996) The frustrations of advocating lifestyle changes are obvious to healthcare providers in clinical practice. Community resources are rarely available or convenient, counseling takes considerable time, and many patients do not adhere to treatment. Even with extensive publicity regarding the importance of blood pressure control and the benefits of drug therapy, only 16% of people with hypertension in Canada had the condition under control (Campbell *et al* 1999). Physicians and other

health care professionals could also be strong advocates for community resources to assist patients with lifestyle changes.

CONCLUSION

From the cited literature, it can be concluded that hypertension is one of the most common and prevalent health problem throughout the world. It is a lifestyle related disorder, thus its major treatment is also recommended lifestyle modifications.

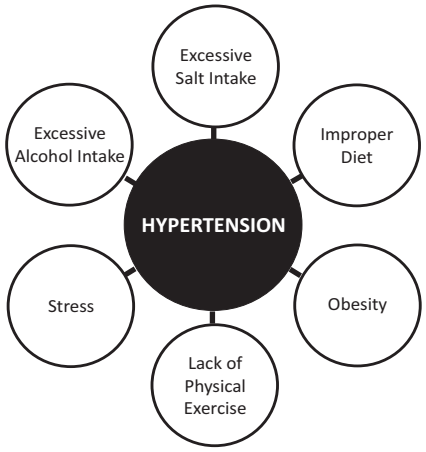


Fig. 1 Conclusion

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