CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

http://doi.org/10.5281/zenodo.2536220

Available online at: http://www.iajps.com *Review Article*

DIET THAT PREVENTS HYPERTENSION

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Abstract:

Introduction: *There are many diet-related illnesses, also known as (lifestyle diseases) involving obesity, coronary heart disease, type 2 diabetes mellitus, various inflammatory conditions as well as cancers. These diseases are caused by dietary changes as well as decreased exercise and activity. Recently, the levels of obesity in the United States adult are estimated to be more than thirty five percent (Ogden et al., 2014). Prevalence of diabetes are estimated about ten percent. Moreover, it is estimated that more than 1/3 of the population have some form of cardiovascular disease (CVD) (Lloyd-Jones et al., 2010), the rates of metabolic syndrome (MetS), which is defined as a cluster of clinical conditions including impaired glucose metabolism, central obesity, elevated triglycerides, reduced HDL-cholesterol, and hypertension (Alberti and and Zimmet, 1998; Alberti et al., 2006) are estimated to be more than twenty five percent. But, these diseases could be prevented by proper dietary or lifestyle modifications (Stampfer et al., 2000; World- Health-Organization, 2000; Franz et al., 2002; World-Health- Organization-UNAIDS, 2007). So, it is highly important to highlight the ongoing research on the role of nutrition in preventing these illnesses. Nutritional epidemiology has previously focused on the relationship of specific foods and nutrients with disease outcomes (Mozaffarian et al., 2011). But, an individual's diet is mix of a variety of foods and not individual nutrients (National Research Council, 1989), which lead to the recognition of the role of individual foods or nutrients in specific health outcomes hard to determine (Ursin et al., 1993). Recently, studying the overall dietary patterns, which takes into consideration the complexity and cumulative/synergistic effect of the foods that make up a diet, has been developed as a helpful method in studying the diet's effects on health (Kant, 1996; Millen et al., 2001; Millen et al., 2005). Other epidemiological studies have linked the consumption of a traditional Okinawan dietary pattern to the reduction of incidence of cardiovascular disease, some cancers, and other chronic diseases (Willcox et al., 2009). Moreover, using the Dietary Approaches to Stop Hypertension (DASH) dietary pattern has been proven to be effective in protecting against CVDs (Salehi- Abargouei et al., 2013).*

So, it is not only are diet is effective for the prevention of certain conditions but also are more easily translatable into actionable changes by the general population (Krauss et al., 2000; Hulshof et al., 2001; Ammerman et al., 2002), thus potentially improving their public health-impact.

Aim of work: *In this review, we will discuss the recent evidence regarding the adherence to a number of different dietary patterns with the risk of certain diet-related hypertension.* ***Methodology:*** *We did a systematic search for diet that prevents hypertension using PubMed search engine (http://www.ncbi.nlm.nih.gov/) and Google Scholar search engine (https://scholar.google.com). We only included full articles.*

Conclusions: *To conclude this review, a personalized diet consisting of mixed foods that has a mixture of nutrients which could have a synergistic effect on health. We definitely need further research in the effects of specific nutrients on health outcomes, essential to further scientific knowledge relating to the health effects of individual nutrients. The recent focus on dietary patterns could be seen as a more holistic approach to the investigation of how long term consumption of certain food combinations can affect health. This "dietary pattern" approach also considered more practical in the area of public health promotion. We reviewed some evidence from different studies which show the potential benefits of 4 "healthy" dietary patterns (Mediterranean, DASH, Prudent, and Seventh Day Adventist) regarding CVD. The evidence provided in this review highlights the effectiveness of higher adherence to the four patterns in decreasing the prevalence of obesity, diabetes, and CVD in comparison to decreased adherence to these diets.*

Key words: *Diet, hypertension, prevention, management.*

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Please cite this article in press Abdullah A. Alrayss et al., ***Diet That Prevents Hypertension.,*** *Indo Am. J. P. Sci, 2019; 06(01).*

INTRODUCTION:

There are many diet-related illnesses, also known as (lifestyle diseases) involving obesity, coronary heart disease, type 2 diabetes mellitus, various inflammatory conditions as well as cancers. These diseases are caused by dietary changes as well as decreased exercise and activity. Recently, the levels of obesity in the United States adult are estimated to be more than thirty five percent (Ogden et al., 2014) [1]. Prevalence of diabetes are estimated about ten percent. Moreover, it is estimated that more than 1/3 of the population have some form of cardiovascular disease (CVD) (Lloyd-Jones et al., 2010)[2], the rates of metabolic syndrome (MetS), which is defined as a cluster of clinical conditions including impaired glucose metabolism, central obesity, elevated triglycerides, reduced HDL-cholesterol, and hypertension (Alberti et al., 2006) [3] are estimated to be more than twenty five percent. But, these diseases could be prevented by proper dietary or lifestyle modifications (Stampfer et al., 2000) [4]. So, it is highly important to highlight the ongoing research on the role of nutrition in preventing these illnesses. Nutritional epidemiology has previously focused on the relationship of specific foods and nutrients with disease outcomes (Mozaffarian et al., 2011) [5]. But, an individual's diet is mix of a variety of foods and not individual nutrients (National Research Council, 1989) [6], which lead to the recognition of the role of individual foods or nutrients in specific health outcomes hard to determine (Ursin et al., 1993) [7]. Recently, studying the overall dietary patterns, which takes into consideration the complexity and cumulative/synergistic effect of the foods that make up a diet, has been developed as a helpful method in studying the diet's effects on health (Millen et al., 2005)[8]. Other epidemiological studies have linked the consumption of a traditional Okinawan dietary pattern to the reduction of incidence of cardiovascular disease, some cancers, and other chronic diseases (Willcox et al., 2009)[9]. Moreover, using the Dietary Approaches to Stop Hypertension (DASH) dietary pattern has been proven to be effective in protecting against CVDs (Salehi-Abargouei et al., 2013) [10].

So, it is not only are diet is effective for the prevention of certain conditions but also are more easily translatable into actionable changes by the general population (Ammerman et al., 2002) [11], thus potentially improving their public health-impact.

In this review, we will discuss the recent evidence regarding the adherence to a number of different dietary patterns with the risk of certain diet-related hypertension.

METHODOLOGY:

We did a systematic search for diet that prevents hypertension using PubMed search engine (http://www.ncbi.nlm.nih.gov/) and Google Scholar search engine (https://scholar.google.com). We only included full articles.
The terms used in the search were: Diet, hypertension, prevention, management.

Mediterranean diet pattern

The Med-Diet is known as the clasic dietary pattern found in Greece, Southern and other olive-growing nations of the Mediterranean basin (Willett et al., 1995) [12]. Currently, in 2010, the Med-Diet was established by UNESCO as a cultural heritage of Humanity, incorporating in its definition other aspects, such as conviviality, socialization, biodiversity and seasonality, (Bach-Faig et al., 2011) [13].

Obesity

There have been some studies that discussed the association between the Med-Diet and obesity, many studies concluded that the Med-Diet was significantly associated with decreased weight gain, and also decreased risk of developing overweight or obesity. Mendez et al. studied whether a Med- Diet pattern was associated with a reduced incidence of obesity

over 3 years using data from the Spanish cohort of the EPICSpain study. High Med-Diet adherence was linked to less probability of becoming obese among overweight subjects, observing similar association in females and males (Mendez et al., 2006) [14]. But, Med-Diet was not linked to incidence of overweight in initially normal weight subjects.

A Spanish study (Beunza et al., 2010) [15] questioned the association between Med-Diet and weight change and assessing the risk of weight gain or the risk of developing overweight or obesity. Study sample with the lowest score of the Med-Diet had the highest average yearly weight gain, while those with the highest adherence had the lowest weight gain.

There are 3 interventional studies (Mart_ınez-Gonz_alez et al., 2012) [16] that concluded a Med-Diet has lowered weight/ BMI significantly, especialy, abdominal obesity. A significant inverse linear association between the 14-item tool and all adiposity indexes was found in more than seven thousand participants from the PREDIMED study (Mart_ınez-Gonz_alez et al., 2012) [16].

There are other studies (Schr€oder et al., 2004;)[17], they showed that higher adherence to a Med-Diet had a bad association with overweight/obesity significantly. In a Spanish population study an increase of 5-units in the Med-Diet score was linked to significant decrease in the BMI of 0.43 and 0.68 kg/m2, in male and females. So, the obesity risk lowered in males and females with higher adherence to the traditional Med-Diet pattern.

To summarize, these studies showed that the Med-Diet pattern as a model of healthy food could be useful in preventing weight gain and the development of overweight, obesity and central obesity.

Cardiovascular diseases

The relation between diet and coronary heart disease (CHD) has been well studied for the last fifty years. The initial step in the treatment of hypertension and other coronary risk factors is to adhere to a healthy diet like the classical Med-Diet and to improve lifestyle, for example decreasing body weight and increasing exercise activity (Mancia et al., 2007) [18]. Eventually, many studies have concluded that a more adherence to the Med-Diet improves CHD prognosis and decreased CHD mortality.

Studies done in the US, in the Northern Manhattan Study Med-Diet was associated inversely with risk of the composite outcome of CVD (ischemic stroke, myocardial infarction or vascular death) (Gardener et al., 2011) and, in the Nurses' Health Study, women in the top Med-Diet score quintile were at lower risk for CHD compared with those in the bottom quintile. Cardiovascular disease mortality was less among females in the top quintile of the Med-Diet score (Fung et al., 2009)[19]. in a recent systematic review, showed that each 2-point increment in a 0–9 score of adherence to the Med-Diet was associated with a 13% relative reduction in the incidence of CVD.

Studies on epidemiology suggested that a polyphenol-rich diet may help to prevent BP from increasing and reduce high BP levels in people with normal-to-high BP or hypertension (Whelton et al., 2002).[20] In another study the PREDIMED trial, the Med-Diet significantly reduced BP compared with the control group after a 4-year intervention (Toledo et al., 2013) [21]. Currently, in elderly participants at high cardiovascular risk included in the PREDIMED trial, we observed that the changes in plasma nitric oxide were associated with significantly lower systolic and diastolic BP after 1- year interventions with Med-Diets supplemented with extra virgin olive oil or nuts, compared with the control diet. In another PREDIMED substudy, Med-Diets reduced 24-hour ambulatory systolic and diastolic BP after a 1-year intervention.

Diet to stop hypertension

The Dietary Approaches to Stop Hypertension (DASH) diet is characterized by high intake of fruits and vegetables, moderate low-fat dairy products, poultry and fish, with substantial amount of plant protein from legumes and nuts, and low red meat, sweets, and sugar-containing beverages, combined with sodium restriction.

DASH diet and Cardiovascular diseases

The DASH diet is commonly endorsed by the National Heart, Lung, and Blood Institute for the prevention and management of hypertension in the US (Appel et al., 2006). This diet decreased the systolic and diastolic BP by five and three mm Hg. In comparison to a control diet; with the decrease even more than (11.4 mm Hg/5.5 mm Hg) in those people with hypertension. In the PREMIER trial more than eight hundred adults with higher-than-optimal BP were randomized to one of three interventions groups: (1) an "established" group, a behavioral intervention that implemented established recommendations, (2) "established plus DASH" group which implemented the established lifestyle modifications plus the DASH diet; and (3) an advice only group.

The overall decrease in systolic BP was three mm Hg in the established group and 4.3 mm Hg in the established plus DASH group, relative to advice only. The prevalence of hypertension at 6 months, compared with baseline hypertension was twenty six percent in the advice only group, seventeen percent in the established group, and twelve percent in the established plus DASH group. The prevalence of optimal BP (<120 mm Hg systolic and <80 mm Hg diastolic) was nineteen percent in the advice only group, thirty percent in the established group, and thirty five in the established plus DASH group (Appel et al., 2003) [22].

These effects of the DASH diet have been established in a free-living U.K. population. Systolic and diastolic BP lowered significantly by 4.6 and 3.9 mm Hg. Therefore, adherence to the DASH-style diet was associated with a lower risk of CHD and stroke among middle aged females during twenty four years of follow-up, in the Nurses' Health Study cohort. Females in the top quintile of the DASH score, compared with those in the bottom quintile.

CONCLUSIONS:

To conclude this review, a personalized diet consisting of mixed foods that has a mixture of nutrients which could have a synergistic effect on health. We definitely need further research in the effects of specific nutrients on health outcomes, essential to further scientific knowledge relating to the health effects of individual nutrients. The recent focus on dietary patterns could be seen as a more holistic approach to the investigation of how long term consumption of certain food combinations can affect health. This "dietary pattern" approach also considered more practical in the area of public health promotion. We reviewed some evidence from different studies which show the potential benefits of 4 "healthy" dietary patterns (Mediterranean, DASH, Prudent, and Seventh Day Adventist) regarding CVD. The evidence provided in this review highlights the effectiveness of higher adherence to the four patterns in decreasing the prevalence of obesity, diabetes, and CVD in comparison to decreased adherence to these diets.

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