Research Article

Non-Pharmacological Management of Hypertension by Dietary Approaches to Stop Hypertension (DASH) In Multan Institute of Cardiology Multan

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Abstract

Purpose: *The basic purpose of the current study was to determine the impact of the dietary approach to stop hypertension applying (DASH) pattern of dietary intake on outdoor hypertensive patients based on baseline lipid concentrations and sex.* ***Method:*** *In the current controlled study, 300 patients were assessed through the DASH Trial, where250 patients were assessed for a 6-month run-in period. Patients enrolled in the control group (n=125) were fed with the usual control diet while the intervention group (n=125) had received DASH.* ***Results:*** *Results showed that the combination diet (the DASH eating pattern) reduced the systolic blood pressure by-18.7 ± 9.8mmHg, and diastolic blood pressure by-7.3 ± 6.5mmHg,as compared to the usual (control) diet where a reduction in systolic and diastolic BP was observed to be -3.2 ± 12.7, and 2.7 ± 8.1, respectively. A significant reductions in weight 1.2 (P = 0.255) and body mass index (BMI) 0.3 (P = 0.315) were observed.* ***Conclusion:*** *Among hypertensive patients, the incorporation of non-pharmacological therapy had beneficial effects in blood pressure control and further showed that pharmacists can play a pivotal role in the clinical management of hypertensive patients. Non-pharmacological measures should be part of routine management of hypertension that can reduce the chances of organ damage.*

Introduction

Elevated blood pressure (hypertension) is considered a major cause of blood vessels and cardiovascular diseases. Metabolic and lifestyle-related factors are suggested to be taken into account for lowering blood pressure (BP) (Kawada and Otsuka, 2010). A predicted number of hypertensive adults (about one billion in 2000) has been reported in the literature for underdeveloped (639million) and developed countries (333 million) (Kearney *et al.*, 2005). The WHO guidelines indicate that suboptimal blood pressure (SBP) >115 mmHg. SBP is one of the major causes of death throughout the world, which also give rise to cerebrovascular and chemic heart disease (Azadbakht *et al.*, 2011). 49 percent heart collapse, 35 percent MI and stroke, and 24 percent early deaths were reported to be caused by elevated blood pressure in the US (Eriksson *et al.*, 1997, Frisoli *et al.*, 2011). Hypertensive patients are reported to have a risk of retina disease, kidney disease, stroke, the bulge in artery, secondary vascular disease, heart collapse, and MI (Sheridan *et al.*, 2003). Medicinal treatment is found effective to reduce hypertension and the final stage of cardiovascular problems (Hodson *et al.*, 2010). To cure and manage hypertension the lifestyle intervention has play an important role. Lifestyle interventions include restricted sodium intake, loss of weight, increased use of fruits and vegetables, reduced use of dairy products, physical activities and less intake of alcohol have early been reported in the literature. Reduction in SBP has achieved 5.5/3.0mm Hg by implementing DASH diet pattern, as compared to a regular diet.

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PREMIER, nonpharmacological approaches were proved to be more valuable in the control of hypertension in a lifestyle trail. Other trials such as the Hypertension Control Program, the TOMHS Weight loss, TONE, Exercise Intervention Trial, Trials of Hypertension Prevention Phase II, and Primary Prevention of Hypertension have indicated equivalent advantageous possessions of the standard of existing changes on hypertensive patients. Detection, Evaluation, and Treatment of Hypertension guidelines have also verified that non-pharmacological measures are the standard treatment for blood pressure control that have been adopted in hypertensive peoples via Joint National Committee 5, Joint National Committee 6, and Joint National Committee 7 (Schoenthaler *et al.*, 2011).

DASH is also recommended by Dietary Guidelines for Americans suggested as model of healthy diet intake for most of the members of the population (Shenoy *et al.*, 2010). Hypertension, metabolic syndrome and diabetes are reported to be affected by the eating pattern DASH (Azadbakht *et al.*, 2005). Public health is now focused on the implications of use of non-pharmacological components for the control of hypertension. The basic purpose of the current study was to determine the impact of dietary technique to stop hypertension applying (DASH) pattern of dietary intake on outdoor hypertensive patients. In the current controlled study, patients were assessed through the DASH Trial. Patients enrolled in control group will be fed with usual control diet while intervention group has received DASH.

Materials and Methods

Study Setting and Duration

This current study was carried out from March 2017 to September 2017 (six months period) at Chaudhary Pervaiz Elahi Institute of Cardiology Hospital, Multan for outdoor Patients. 250 volunteer patients were randomized to intervention groups (n = 125) and control group (n = 125). Usual diet was fed to the control group.

Study Design

Before participating in the study, every volunteer patient signed up a consent letter which includes; permission to take part in the research project, and to the use the volunteer's information. Volunteers filled up a set of printed questions, devised for the purpose of the current study to collect information such as education, age, sex, waist circumference, BMI, blood pressure, smoking history, and dietary intake. Interventional study design was conducted for a period of 5-month in Chauhdary Pervaize Elahi Institute of Cardiology Hospital, Multan complying the entire international clinical guidelines.

The demographic and socioeconomic data was collected from the volunteer patients at the first day of screening. Employment status, total income, education, area of residence, and other data including age, health status (such as fasting blood sugar, hypertension, hypercholesterolemia), pattern of dietary intake, types of medication were also recorded. Life routines including frequency of physical activities, smoking were also recorded along-with height, weight, and waist circumference. Family history of diseases was also collected (yes/no). Regular contact (through phone calls and in the hospital) with the volunteer patients was maintained to aid compliance during the entire period of study with various frequencies.

History of smoking of current smokers, former smokers (who left smoking) and never smokers (who never tried to take cigarette) was collected. Volunteers physical activities include time spent in jogging, sports, gym, frequency of exercise. Measurements of height and weight were used to calculate body mass index (BMI).

Ethical Consideration

This study was performed in accordance with the ethical standard of the institution and the Declaration of Helsinki was approved by the ethical committee of the department of pharmacy, Bahauddin Zakariya University, Multan, Pakistan (Reference No: Acad/ PRAR/18-20/20/17).

Criteria for Selection of Patients

- Hypertensive patients of Stage I and Stage II.
- Patients who volunteered themselves for the study and agree to follow the instruction.
- Both male and female hypertensive patients with an age range 25 to 85 years.
- The patients who meet at least three out of the five parameters of the metabolic syndrome criteria;1) waist circumference for men > 40 inch, for women > 35 inch, 2) Triglycerides >150mg/dl, 3) Systolic blood pressure >130mmHg or Diastolic blood pressure >85mmHg, 4) Fasting blood glucose >100mg/dl, 5) HDL Cholesterol <40mg/dl for men and < 50mg/dl.

Criteria for Exclusion of Patients

- The diabetes patients having insulin therapy.
- The obese patients having a BMI ≥ of 30 kg/m^2.

Patients' compliance was evaluated after completion of the patient data. The level of compliance may be altered by lifestyle habits and socioeconomic characteristics. The volunteer patients were divided into two groups: 1) the Control group who were fed up with the usual diet, 2) the Intervention group fed up with the DASH diet. Both of the groups were informed about the complication of the disease, the importance of the DASH pattern, effect of timely taken medicines on hypertension & food consumption. They were advised to stop or reduce smoking and to carryout physical activities to reduce weight.

Statistical analysis

The statistical formula was used to determine the sample size (125 in each group). Statistical software SPSS version 16.0 was used for the statistical analysis.

Results & Discussion

This study was conducted by demographic, socioeconomic, and lifestyle data from hypertensive patients attending Ch. Pervaiz Elahi Institute of Cardiology, Multan. A total of 300 volunteers were screened of which 50 were excluded due to missing data. 250 (83.3%) out of 300 patients were finally selected for the study. 125 (41.6%) out of 300 patients were selected in each study group that started the run-in phase. The control group contains 69 (55.2%) female patients and the intervention group 62 (49.6%), whereas male volunteer patients selected in the control group were 56 (44.8%) and 63 (50.4%) in the intervention group. In the control group, the hypertension prevalence was higher in urban area 111 (88.8%) than in rural area was 14 (11.2%). A similar pattern was observed for the intervention group, 110 (88.0%) urban area and 15 (12.0%) in rural área. 114 (91.2%) volunteer patients of the control group and

116 (92.8% of the intervention group were married. Risk factors of diabetes, smoking, excessive use of salt was 32 (25.6%), 22 (17.6%), and 62 (49.6%) respectively for control and 74 (59.2%), 18 (14.4%), and 20 (16.0%) respectively for intervention group. The family history of hypertensive patients was 67 (53.6%), diabetic patients was 27 (21.6%) and cardiac diseases was 68 (4.4%) for control and 43 (34.4%), 59 (47.2%) and 29 (23.2%) respectively for intervention group. The frequency of cardiac and hypertensive patients in the control group was higher than the intervention group, whereas diabetic patients were lower in the control group than the intervention group.

Table 1: Baseline characteristics of control and intervention groups

Characteristics	Control study (n=125)	Interventionstudy (n=125)
Gender (%)		
Male	44.8	50.4
Female	55.2	49.6
Age in years		
Mean	49.69	50.58
Range	27-78	24-78
BMI		
Mean	26.19	26.58
Range	18.93-54.7	18.93-33.8
Weight (kg)		
Mean		
Range	69.16	70.56
	50-98	50-98
Smoker (%)		
Current	17.6	14.4
Former	11.2	6.4
Nonsmoker	71.2	79.2
Education		
Primary	13.6	1.6
Middle	24.8	28.8
Matric	28.0	28.8
Intermediate	18.4	19.2
Graduate and Master	7.2	13.6
Illiterate	8.0	8.0
Systolic blood pressure		
120-139	12.8	16.8
140-159	47.2	45.6
$\geq$160	40.0	37.6
Diastolic blood pressure		
80-89	8.8	4.8
90-99	35.2	37.6
$\geq$100	56.0	57.6

The frequency of cardiac and hypertensive Patients in the control group was higher than the intervention group, whereas diabetic patients were lower in the control group than the intervention group.

Baseline characteristics are summarized in Table 1 and statistical differences in Table 2. Insignificance differences in weight reduction between control and intervention groups (1.2 kg, P = 0.255) was observed and

significant reductions of BMI (-0.5 kg/m², P=0.045) were seen in intervention and in control group (-0.2 kg/m², P=0.041).The mean difference of Systolic blood pressure between the control and intervention group from baseline was significant (15.5 mmHg, P= 0.000). Significant reduction of Diastolic blood pressure in the control group (-2.7 mmHg, P=0.001) and intervention group (-7.3 mmHg, P=0.000) was seen but an extra reduction in the intervention group which show the hopeful result of DASH. Significant reduction (4.6 mmHg, P= 0.000) in a mean difference of Diastolic blood pressure between control and intervention group.

Table 2: Statistical difference in variables after consumption of the DASH and control diet

Parameters	Control Diet (n=125)	DASH (n=125)	Differencebetween control &Interventiongroup (P value)
Weight (kg)			
Baseline	69.2 ± 9.9	70.6 ± 9.6	
End of trial	68.8 ± 9.8	69.0 ± 8.8	1.2
Difference from baseline, mean difference (95% CI, P value)	- 0.4 P = 0.400	- 1.6 P = 0.769	P = 0.255
Body mass index (kg/m²)			
Baseline	26.2±4.6	26.6±4.4	
End of trial	26.0±4.8	26.1±2.9	0.3
Difference from baseline, mean difference (95% CI, P value)	_ 0.2 P = 0.041	- 0.5 P = 0.045	P = 0.315
Systolic blood pressure (mmHg)			
Baseline	151.4 ±15.4	151.5 ±15.7	
End of trial	148.2 ±12.7	132.8 ±9.8	15.5
The difference frombaseline, mean difference (95% CI, P-value)	- 3.2 P = 0.000	- 18.7 P = 0.000	P=0.000
Diastolic Blood pressure (mmHg)			
Baseline	95.3 ± 7.6	95.3 ± 7.2	
End of trial	92.6 ± 8.1	88.0 ± 6.5	4.6
The difference frombaseline, mean difference (95% CI, P-value)	- 2.7 P = 0.001	- 7.3 P = 0.000	P = 0.000

The diets containing fruits and vegetables help in reduction in cardiovascular disease as well as achieving ideal weight. The risk of developing metabolic syndrome is also deceased with weight loss (Shenoy *et al.*, 2010). Insignificant reduction in mean differences of weight 1.2 (P= 0.255) between control and intervention groups was observed. Culture habits and lifestyle influence metabolic disorders strongly than genetic factors (Nguyen *et al.*, 2012). Our results (88.8% urban area) suggest that people living in urban areas had a higher incidence of developing metabolic risks. In those patients with medication controlled hypertension can help them in the reduction of dosage and also stoppage of therapy (Bhatt *et al.*, 2007, Costa, 2002).

In the current study expected results of the implication of a 6-month DASH diet on hypertensive volunteer patients at Chaudhary Pervaiz Elahi Institute of

Cardiology, Hospital, Multan were observed. A significant reduction in systolic and diastolic blood pressure, HDL, and total cholesterol values was recorded. The results of the current study i.e 44.2% for males and 55.2% for females in the control group, 50.4% for men and 49.6% for women in the intervention group are comparable to 30% and 27% in men and women as reported earlier (Pitsavos *et al.*, 2006). The results are found higher than the study in which 459 volunteers were investigated in an 8-week randomized trial to implicate comparison of DASH and the traditional American diet.

The results are found higher than the study in which 459 volunteers were investigated in an 8-week randomized trial to implicate comparison of DASH and the traditional American diet. 6mmHg and 3mmHg decrease in systolic BP diastolic BP respectively due to DASH was observed in the results (Frisoli *et al.*, 2011, Palmer *et al.*, 1995). Whereas in the recent study it was found that systolic BP and diastolic BP were reduced by 19mmHg and 7mmHg correspondingly.

Conclusion

In conclusion, our study elaborates that incorporation of DASH with medicinal treatment is an effective way to help participants to control their systolic and diastolic blood pressure. In presented data, it confirms that hypertension is a major health problem in the population. The presented study shows that hypertension is a major health problem among the population. Results from this study also suggest that the potential of using vegetables and fruits in combination with the low amount of dairy food which has very low-fat contents control the total cholesterol level and cause weight loss in hypertensive patients. It is emphasized that simple advice from a pharmacist can have a positive influence on a patient's motivation to make lifestyle changes. Aggressive efforts of the pharmacist have played a vital role in better results in hypertensive patients.

Conflict of Interest

The authors have no conflict of interest to declare.

Acknowledgement

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