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Effect of dash diet on the old age subjects suffering from hypertension

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Abstract
Hypertension (HTN) or high blood pressure, sometimes called arterial hypertension, is a chronic medical condition in which the blood pressure in the arteries is elevated. Hypertension is classified into two parts i.e. Systolic (contraction of heart) and Diastolic (Relaxation of heart) This study was designed specifically keeping in mind the role of Hypertension in our lives and how it can be managed by eliminating the wrong lifestyle and dietary habits. The present study was carried out on forty subjects selected by purposive random sampling belonging to region of Chanakyapuri, New Delhi. The subjects were suffering from hypertension and high lipid levels. The dietary intake was surveyed by 24 hour dietary recall method. The medical history showed their high blood pressure levels. Then the DASH (Dietary Approaches to Stop Hypertension) diet was provided to the patients for three months. It is a very popular diet which is given in high Blood pressure and it stresses on the low sodium diet as well as giving the food groups rich in n potassium, magnesium and calcium whose ratio with sodium reduces the increased levels of sodium. The DASH diet features menus with plenty of vegetables, fruits and low-fat dairy products, whole grains, fish, poultry and nuts. The study concluded to attain the reduced levels of Blood pressure and lipid levels.

Keywords: hypertension, systolic (contraction of heart), diastolic (relaxation of heart)

Introduction
Normal blood pressure at rest is within the range of 100–140 mm-Hg systolic (top reading) and 60–90 mm -Hg diastolic (bottom reading). The range of HBP is always above 140/90 mm-Hg.

The next classification of HBP is Primary which is also called essential hypertension and secondary hypertension is also called acquired also that means that the lifestyle or other body factors are the culprits for developing such secondary type of hypertension. This is the HBP developed due to Kidney, liver or disorder of any other organ.

Hypertension pressurize the heart to pump forcibly, possibly leading to hypertensive heart disease and coronary artery disease. (Collins, 2002). Hypertension is also a major risk factor for stroke, aneurysms of the arteries (e.g. aortic aneurysm), peripheral arterial disease and chronic kidney disease.

The symptoms of Hypertension includes Headaches which is present at specific location i.e the back of the head. Other symptoms are lightheadedness, vertigo, tinnitus (buzzing in the ears), altered vision or fainting episodes (Williams, 2005). These symptoms are a clear indication of development of HBP and heart disorders.

When Hypertension has to be diagnosed the readings has to be taken once a month for every three months and different sphygmomanometer has to be used (North of England Hypertension Guideline Development). The patient should have regular monitoring of the Blood pressure and consultation can be done in separate clinics.

After the diagnosis of hypertension, doctors try to find the actual reason for the development of HBP but sadly many doctors are unable to find the specific reason for development of this disease. The main causes are Obesity, family history, stress, psychological disorders such as anxiety and depression.

The effect of HBP is seen on many organs and systems including heart, liver, endocrine glands, kidneys and central and autonomic nervous system. Many studies have proven that there is always a risk of developing the stroke, coronary heart disease, congestive heart failures, peripheral vascular disease, and nephrosclerosis.

Therefore, any definition of elevated blood pressure is arbitrary and serves to classify people into risk categories.

Types of Hypertension
Doctors classify high blood pressure based on cause and characteristics.

1. Essential Hypertension
2. Isolated Hypertension
3. Secondary Hypertension
4. White Coat Hypertension
5. Liable Hypertension
6. Malignant Hypertension
7. Hypertension during Pregnancy

1. Essential Hypertension
The ratio of people with HBP is around 90% of people with high blood pressure have essential hypertension or Primary hypertension. This means the condition has no identifiable medical cause as its source. Essential hypertension is often inherited. Elevated blood pressure usually Begin to appear between ages 30 -50, but can begin at older ages.

2. Isolated Systolic Hypertension
The elasticity of arteries of the heart loosens with age and when

blood flows with pressure in such cases the arteries of heart become hard which is also called Atherosclerosis. The hardening of arteries is more complex and causes hypertension to develop. This is called Isolated Systolic Hypertension.

3. Secondary Hypertension
As explained above also that some particular medical problems causes HBP. When the medical problems are treated this type of HBP comes back to normal.

4. White Coat Hypertension
The Psychological disorders such as Depression and Anxiety cause elevated blood pressure. The blood pressure seems to be normal at home but gets high at doctors clinic.

5. Labile Hypertension
This type of blood pressure that goes up and down very rapidly and abruptly. The symptoms include headache or sound of ringing in ears.

6. Malignant Hypertension
Malignant Hypertension is unusual form and a threatening kind of HBP. The BP rises to a level which become life threatening.

7. Hypertension during Pregnancy
It's also very common form of Hypertension and often found during first pregnancy. Hormonal fluctuations cause high blood pressure or from the conditions of pregnancy such as pre eclampsia.

Etiology
Age
As explained above also the hardening of arteries causes the development of HBP.

Sex
Several studies show that the hypertension is prevalent more among males than the females. Ethnic and Racial differences
The different races and societies in the world have levels of HBP and even in India the difference prevails in different states. The generalized data cannot be compiled. The cultural and environmental factors infuence the development of Hypertension. When people move from rural to urban areas for jobs search or for their livings, their mean body pressure fluctuates and they become prone to development of Hypertension.

Heredity
Hypertension is said to be influenced by genes and environment. Although it has been determined whether it is via a single gene or is a polygenic inheritance. The current consensus for humans is that the predisposition is a polygenic and the tendency to develop hypertension remains latent unless one or more environmental influences (sodium and potassium intake, psychosocial stress, obesity and other nutritional factors) activate the mechanisms that raise blood pressure. Studies in human have provided strong evidence of similar blood pressure among twins, siblings and other first degree relatives. However, effort to identify genetics makers for susceptibility to hypertension or for sodium sensitivity have not been successful and other therefore no valid methods exists for predicting susceptibility to hypertension.

Exercise and Activity
Some studies suggest that elevated bodily movement and exercise have long-term hypertensive effect, either independently or in association with diet, but the data is inconclusive.

Obesity
Obesity is one the major causes of HBP and the increased body fatness contributes to the same. Many studies proves that weight loss has positive effect on lowering the blood pressure. Each kg of weight reduction leads to reduction in blood pressure upto 4.6 and 6.0 mm Hg. Data from NHANES showed that 23 per cent of US population. Hypertension was prevalent with Obesity in young adults (2005). Therefore the adiposity is linked to High blood pressure and many subjects complain about water retention when fat cells are more than normal. So we recommend less salt intake for obese people also.

Materials and Methods
The purpose of this study was to see the association of dietary and physical pattern of the subjects as well as the effects of cardiovascular diseases in the 40-60years age group.
The method and material used for investigation are discussed under the following headings:

Locale of study
The study was conducted on adults belonging people of Delhi, NCR. The patients were selected from the area of Chanakyapuri, Delhi

Selection of the subjects
1) The selection of subjects was done on the basis of Purposive Random sampling. Specefically the subjects suffering fron High BP were selected. Forty such Adults between 50-60 years of age were selected from Delhi and NCR.
2) The height and weight of all the subjects were measured.

Experimental Plan
The subjects were divided equally and twenty males and females were selected for the study.

Development of Questionnaire
A dichotomous questionnaire was prepared by the researcher to know the dietary intake and medical history of the subjects. The factors related to diet were to be studied that whether the diet was responsible for developing hypertension. 24 hour recall method was used to find their dietary intake. The subjects were also guided for dietary intake.

Statistical Methods
The statistics was applied in form of mean and standard deviation. MS-excel was used for calculation of the mean and standard deviation.

Results and Discussion
The Table no 1 is self-explanatory. The demographic details of the subjects were taken by the developed questionnaire. The data showed that 86% of male subjects were taking alcohol and alcohol is one of the reason for developing Hypertension. Before study period the 43% male subjects and 62% female were following diet to lower HBP and also to lose weight. It was also shown 82% male and 62% female subjects had mild or sedentary

activity. The subjects were not very active due to old age and were leading a sedentary lifestyle. Sixty one per cent male and Eighty one per cent were Obese and had elevated weight. The Obesity is major culprit of causing Hypertension. Weight loss leads to decrease in hypertension per mm hg so hypocaloric diet with sufficient electrolyte balance is recommended. The pretest scores showed no significance weight loss in the past and also no change in the HBP levels.

Table 1: General Information of the subjects

Population characteristics (1)	Response (2)	Percentage	
		Male (n=20) (3)	Female (n=20) (4)
Marital Status	Single	0	0
	Married	100	100
Occupation	Working	80	40
	Non-Working	20	60
Smoke or Chew	Yes	80	10
	No	20	90
Alcohol Intake	Yes	86	0
	No	14	100
Following a Diet	Yes	43	62
	No	57	38
*Activity Level	Mild	82	62
	Moderate	12	16
	Active	10	20
Weight	Gained	61	81
	Lost	0	0

*Multiple responses

Table 2: Average Blood Lipid and Blood pressure levels of the subjects before and after the study.

Blood Parameters		Subjects (n=40)
Total Triglyceride	B	300.81±126.08
	A	173.97±75.83
Total Cholesterol	B	211.42±32.38
	A	186.31±37.62
HDL	B	49.00±9.41
	A	48.17±10.27
VLDL	B	61.36±35.49
	A	35.43±16.79
LDL	B	105.5±35.15
	A	101.61±35.69
Hypertension	B	170.70 ± 22.58
	A	112.20±17.29

B=Before, A=After n = Total number of subjects

It was found during the course of study that Hypertension was accompanied by high Lipid levels as well. So the dietary modifications were done for Hypertension and as a result the lipid levels also came down as shown in table no. 2.

The aetiology of Hypertension is already discussed and after the disgnosis of Hypertension was done then treatment can be done. The idiopathic hypertension generally do not have any symptoms and patients lead a normal life but that does not mean HBP is not present. It has already been told that HBP leads to heart problems and it was evident from the data as well that subjects suffered High Lipid levels.

The treatment refers to be the combination of diet, drugs and behaviour modifications. The details are also discussed that what modifications did researcher provided to the patients.

The therapy of beta blockers and diuretics is well known to cure Hypertension. But there is always risk of vital organs.

Conclusion

DASH dietary pattern

The DASH (Dietary Approaches to Stop Hypertension) dietary pattern is recommended by the American Heart Association. This diet changes the overall eating pattern of the subjects who agree to follow this diet. This diet consists of doubling the eating daily and replacing the meal by fruits, vegetables, polysaccharides or whole carbohydrates and low-fat dairy products. DASH Diet lowers the fat, lipids in the body as there is drastic change in the daily diet of the individual. It is full of low fat and cholesterol in the dietary pattern. The high levels of potassium, calcium is responsible for lowering the Hypertension.

Regulation of caloric intake

A combination of active support for diet plus behavioural therapy (self-monitoring, stimulus control, slowing rate of eating, social support) is more effective for weight loss in young adults as compared to diet intervention alone (Paul, 2009). After the weight reducing interventions the subjects reduced their Weight and Anthropometric indices back to the normal (Sharma, 2015)

Low sodium diet

The sodium is reduced and is associated with lowering blood pressure. The patient with moderate Hypertension is provided a sachet having 4 grams NaCl. The current Dietary Guidelines recommend consuming no more than 2,300 milligrams of sodium per day.

Potassium, calcium, and magnesium

Many researches have shown the decrease in sodium with high potassium levels. It regulates body's water balance.The recommended intake of potassium for adults is 4.7 grams/day. The potassium rich foods such as citrus foods, Green leafy vegetables, potatoes and carrots are to be eaten in hypertension daily to lower down the BP.

The blood pressure lowering is proved to be with the intakeof calcium and magnesium

Dietary fat

Current recommendations for dietary fat include decreasing intake of saturated fat and Tran's fat as well as overall intake of dietary fat.

Hypertension can be managed and prevented effectively by dietary and behavioural modifications. Further studies with more number of subjects can be beneficial.

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