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Study of Impact of Nutritional Counseling in the Management of Hypertension in Bhilai Township

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Abstract:

Subjects residing in various areas of Bhilai Township between the age group 40 to 60 years were screened for their Blood Pressure level. They were then classified into different categories according to the classification of W.H.O. Sixty Hypertensive subjects were selected for the Final study on the basis of their co-operation. Nutrition Education was imparted to the subjects regarding Food-habit, Type of Diet and its impact on metabolic disorders .Blood Pressure was recorded thrice in the entire course of the study i.e. after 30,60,and finally 90 days of intensive Dietary Counselling. The study revealed positive effect of dietary modification in the control of Blood Pressure.

Keywords: Dietary Counselling, Hypertensives, Blood Pressure

1. Introduction

In present era obesity, heart disease, diabetes and cancer are the major health problems of the modern society. These health problems have increased enormously in recent past. Different aspects regarding their causes and remedies have been studied. Hypertension is a chronic medical condition, in which blood pressure is elevated. The world health organization attributes hypertension as the leading cause of mortality. The world hypertension league umbrella organization of 85 national hypertension societies recognized that more than 50% of the hypertensive population worldwide are unaware of their condition (Chokalingam, 2007). It is estimated that nearly one billion people are affected by hypertension worldwide and this figure is predicted to increase to 1.5 billion by 2025 (Kearney *et al.*, 2005). In India, it is predicted to assume epidemic proportions by the year 2015. W.H.O. predicts that 100 million or 60% of the world's heart patient will be Indians by the year 2210. Without widespread dietary improvement Indian heart disease toll will double by 2015 (Esselstyn *et al.*, 2001).

Category	Systolic Pressure (mm of Hg)	Diastolic Pressure (mm of Hg)
Normal	<120	<80
Pre hypertensive stage	120-139	80-89
Hypertension stage-I	140-159	90-99
Hypertension stage-II	>160	>100

Table 1: Four categories of blood pressure as per the recommendation of American Heart Association

Decline in overall health that took place in the last century was due to altered eating habits of country people . The changes that was important –

- Decline in the consumption of milk
- The general use of refined sugar which had previously been an aristocratic delicacy and
- The introduction of roller milled white flour which was softer than the traditional whole meal stone ground wheat (Drummond *et.al.*,1959)

In today's world the pace of life is fast and it has become virtually impossible to follow the three or four meal pattern that was traditionally accepted. Traditional Indian foods were very much balanced with lots of fibrous components. Industrialization has brought an increased consumption and availability of refined and carbohydrate rich foods. Biscuit, noodles, chips, burger, pizza and other readymade items are few example.

2. Methodology

This study includes lifestyle assessment, Dietary survey, Recording of Blood Pressure and an Intensive diet counselling. Life style modification and non pharmacological options were offered to the Hypertensive subjects. Importance of balanced diet and use of DASH diet was suggested (Education planning group, 1996)). The preventive role of corrective nutrition is an ever evolving process. Improper and inadequate diets contribute to several chronic degenerative diseases such as CVD, diabetes and cancer. A low fat plant based vegetarian diet influences nutrient intake and body composition. It affects insulin sensitivity because such diets are low in fat and high in fibres. Lipid lowering effect of vegan diet is due to absence of dietary cholesterol, low saturated fat content and specific cholesterol reducing effect of soluble fibres.

Cholesterol is a constituent of animal foods but is absent in plants. Vegetable oils do not have cholesterol. Dietary saturated fatty acids (found in animal foods) elevate blood cholesterol level with increase in cholesterol intake so it is best to keep cholesterol intake as low as possible. Saturated fatty acids also accelerate the process of atherosclerosis and thrombosis increasing blood pressure and arrhythmias; on the other hand poly unsaturated fatty acids have opposite effects.

The food we eat and the healthy dietary practices are the cornerstones of good health and vitality. Food consumption of a person is affected by many disciplines. A balance diet provides these nutrients in proportions which satisfy the body needs according to age, sex, activity and physiological status. Recent research reports that calcium in dairy products like milk; cheese, yogurt etc act as fat burner that can boost weight loss by increasing fat breakdown in fat cells. Dairy products also contain friendly fat known as conjugate linoleic acid (CLA) which is a good fat that helps to reduce body fat and increase lean muscle mass and lower bad cholesterol.

Among animal foods fish and fish oil lower blood cholesterol and triglycerides Candy, cookies and other sweets have few vitamins and minerals and are often high in fat and calories. We can replace some of the carbohydrates of our meal with a sweet keeping total carbohydrate count the same.

The subjects were advised to take small and frequent feedings instead of two or three heavy meals. Salt plays a key role in both hypertension and obesity. It makes us both hungrier and thirstier and also makes our fat cells fatter. A large percentage of us are getting two to three times the salt we actually need. Pickled foods, processed meats and canned foods contain lot of salt. It is always wise to aim for a maximum of 200mg sodium intake by simply eliminating table salt and reducing cooking salt. Fats are necessary nutrients for health. They play variety of important functions but when they are present in excess, they put an adverse effect on the health of the individual. Eating greater amounts of fat burning foods can make us thin without starving ourselves. These foods are sometimes referred to as negative calorie foods that are foods that require more calories to digest than the nutritive value they contain. Foods high in proteins are the best An unsaturated fat, oleic acid found in olive oil, avocados and nuts trigger a compound called Oleylethanolamide (OEA) in the small intestine which curbs hunger pangs. Oleic acid transforms into OEA, activates nerve endings which carry a hunger curbing message to the brain, increasing feeling of fullness. This process takes up about twenty minutes.

Fruits that are rich in anthocyanin's such as blueberries, strawberries, oranges and black currants help to prevent development of Hypertension. Apple, apricots, lemon, cherries, papaya, pears, grapes, pineapples, pomegranate, Salad add fibre, making us feel full longer. Instead of having salad as a starter, for a large meal, main course salad, as a complete meal, for lunch or dinner can be prepared. It reduces calories and provides satiety. Celery, tomatoes and onion provide a boost to our blood stream. Flavonoid in celery called apigenin dilates blood vessels and lowers blood pressure. It also contains a unique chemical called 3 - n butyl phthalide which is the main component that lowers B. P. Tomatoes contain an antioxidant lycopene. Sprouted soyabean is a rich source of Isoflavonoid phenolics especially genistein and diadzein which have numerous health benefits, they also have antihypertensive potential (Patrick *et. al.*, 2005). Moong bean sprouts are good source of protein, fibre and vitamins. Barley is a whole grain, rich in vitamin B, magnesium, zinc and a soluble fibre beta glucan. Sprouted barley is much more nutritious. Alfa alfa sprouts contains phyto-estrogen that protect us against heart disease. Onion contains flavonoid called 'quercetin' a strong antioxidant which lowers blood pressure and improves the lining of arteries.

Lettuce, peppers and cucumber are also good for heart. Intake of vegetable oils has been suggested to avoid hyper lipidemia and increased cholesterol levels. Fat intake can be reduced by avoiding deep frying and using steamed food. To cut down the use of cooking oils, non stick pans and vessels are advisable. Repeated heating of oils should be avoided. Except coconut and vanaspati, any other vegetable oil should be used with mustard oil. Rice bran oil extracted from the germ and inner husk of rice is naturally abundant in antioxidants such as tocopherol, oryzanol and tocotrienol. Research has proved that oryzanol reduces harmful cholesterol without reducing good cholesterol. Tocotrienol is a powerful Vitamin E existing in nature. It also contains phytosterols which are believed to lower the consumption of cholesterol. World Health organization recommends the ratio of saturated fatty acids MUFA and PUFA to be 1:15:1. Rice bran oil meets the WHO recommendations better than any other oil. It is also known as Indian Olive oil.

Heart disease is caused partly by reactive oxygen, including free radicals acting on LDL or bad cholesterol and resulting in hardening of arteries. Red blood cells are particularly susceptible to oxidative damage because they are the body's oxygen carriers. An antioxidant DHPEA - EDA protects red cells from damage which is present in olive oil.

The diet nutrition and prevention of chronic diseases (report of the World Health Organization 2003) recommend that 55-60% of daily calorie intake should be from carbohydrate, 45-50% of these calories should come from complex carbohydrates and natural sugars found in fresh fruits and vegetables and not more than 10% from refined and processed sugars.

Fibre has several functions. Apart from making the diet bulky it delays the absorption of carbohydrate and fat and therefore has satiety value. Usually daily energy intake consists of 15-30% of fat. We need relatively small amounts of protein for good health. The requirement for adults is .8 gm/kg. Consumption of plant food alone (such as done by vegetarians) was once regarded as

having inadequate in protein quality. Vegetarians can obtain good quality protein from plants by mutual supplementation techniques such as combining rice and beans, cereal and milk and peanut butter on whole grain bread etc. (Whitney *et al.*, 1998). Awareness towards health has brought about several positive changes in food habits. In the present study it was observed that most of the subjects were taking a reduced diet (with less calories than normal) but the distribution among proximate principles was not adequate. This distribution can be modified by increasing the quantity of protein and decreasing fat and carbohydrate. Along with protein quantity quality is also a factor of consideration..

3. Result and Discussion

Impact of dietary counselling was also observed in lifestyle profile and food consumption pattern. A positive correlation was observed with lifestyle modification, reduction in the quantitative intake of sweets, salt, fried foods, alcohol, smoking and tobacco chewing and increase in the quantitative intake of milk, green leafy vegetables, fruits, salad and sprouts was observed

Blood Pressure	(a)	(b)	(c)	(d)	‘t’
	Before Nutrition Education	After 30 days	After 60 days	After 90 days	
	Mean±S.D.	Mean±S.D.	Mean±S.D.	Mean±S.D.	
Systolic	149.73 ±17.13	149.60 ±17.37	148.53 ±18.27	145.66 ±18.47	t(ab) 1.44 t(ac) 2.43* t(ad) 5.56** t(bc) 2.15* t(bd) 5.57** t(cd) 4.48**
Diastolic	98.93 ±7.08	98.66 ±7.07	97.66 ±6.42	96.40 ±5.45	t(ab) 2.50* t(ac) 3.94** t(ad) 3.58** t(bc) 3.48** t(bd) 3.27** t(cd) 2.44*

Table 2: Pre and Post-Test Statistics of Systolic and Diastolic Blood Pressure of Male Hypertensives (n=30)

* Significant at .05 level; ** Significant at .01 level

3.1. Effect of nutrition education on systolic blood pressure of male hypertensive subjects

- No statistically significant decrease was observed in pre-test systolic blood pressure of selected male hypertensive subjects after 30 days of study period. The mean systolic blood pressure (M=149.73) of selected male hypertensive subjects, which was recorded prior to nutrition education was reduced very slightly after 30 days of study period (M=149.63), but it was not significant at any acceptable level of significance (t=1.44).
- The pre-test systolic blood pressure of selected male hypertensive subjects (M=149.73) was found to be significantly reduced after 60 days of study period (M=148.53). The reported t=2.43 was statistically significant at .05 level, confirmed this fact.
- The pre-test systolic blood pressure of selected male hypertensive subjects (M=149.73) was found to be significantly reduced after 90 days from the study period (M=145.66). The reported t=5.56, was statistically significant at .01 level, confirmed this fact that after 90 days, the pre-test systolic blood pressure of selected subjects came down significantly who received nutrition education.

3.2. Effect of nutrition education on Diastolic blood pressure of male hypertensive subjects

- The pre-test diastolic blood pressure of selected male hypertensive subjects of (M=98.93) was found to be significantly reduced after 30 days of study period (M=98.66). The reported t=2.50, was statistically significant at .05 level, confirmed this fact.
- The pre-test diastolic blood pressure of selected male hypertensive subjects (M=98.93) was found to be significantly reduced after 60 days of study period (M=97.66). The reported t=3.94 was statistically significant at .05 level, confirmed this fact.
- The pre-test diastolic blood pressure of selected male hypertensive subjects (M=98.93) was found to be significantly reduced after 90 days from the study period (M=96.40). The reported t=3.58 was statistically significant at .01 level, confirmed this fact.

3.3. Effect of nutrition education on systolic blood pressure of female hypertensive subjects

- The pre-test systolic blood pressure of selected female hypertensive subjects (M=144.53) was found to be significantly increased after 30 days of study period (M=147.33) despite receiving nutrition education. The reported t=2.74, which was statistically significant at .01 level, confirmed this fact that despite receiving nutrition education, the pre-test systolic blood pressure of selected female hypertensive subjects of control group increased significantly.

The mean systolic blood pressure (M=144.53) of selected female hypertensive subjects, which was recorded prior to nutrition education programme was found to be decreased slightly when recorded after 90 days of study period (M=144.06), however, this decrease was not significant at any acceptable level of significance (t=1.58)

Blood Pressure	(a) Before Nutrition Education	(b) After 30 days	(c) After 60 days	(d) After 90 days	't'
	Mean±S.D.	Mean±S.D.	Mean±S.D.	Mean±S.D.	
Systolic	144.53 ±14.14	147.33 ±15.30	144.73 ±13.95	144.06 ±13.80	t(ab) 2.74* t(ac) 0.63 t(ad) 1.58 t(bc) 2.67* t(bd) 3.20** t(cd) 2.07*
Diastolic	90.53 ±4.36	90.53 ±4.36	90.13 ±4.34	89.40 ±4.26	t(ab) - t(ac) 2.11* t(ad) 2.75** t(bc) 2.11* t(bd) 2.75* t(cd) 2.33*

Table 3: Pre and Post-Test Statistics of Systolic and Diastolic Blood Pressure of Female Hypertensives (n=30)

* Significant at .05 level; ** - Significant at .01 level

3.4. Effect of nutrition education on diastolic blood pressure

The pre-test and reading after 30 days from study period on diastolic blood pressure was same i.e. 90.53. The pre-test diastolic blood pressure of selected female hypertensive subjects (M=90.53) was found to be decreased significantly after 60 days of study period (M=90.13).

The reported t=2.11, which was statistically significant at .01 level, confirmed this fact.

- The pre-test diastolic blood pressure of selected female hypertensive subjects (M=90.53) was found to be decreased significantly after 90 days of study period (M=89.40). The reported t=2.75, which was statistically significant at .01 level, confirmed this fact.
- The reported t value of 2.11 in table no. 2 showed that the diastolic blood pressure of selected female hypertensive subjects after 60 days of study period (M=90.13) was significantly decreased from what it was after 30 days of study period (M=90.53) at .05 level of statistical significance.
- The reported t value of 2.75 in table no. 2 shows that the diastolic blood pressure of selected female hypertensive subjects after 90 days of study period (M=89.40) was significantly decreased from what it was after 30 days of study period (M=90.53) at .05 level of statistical significance.
- The reported t value of 2.33 in table no.2 showed that the diastolic blood pressure of selected female hypertensive subjects after 90 days of study period (M=89.40) was significantly decreased from what it was after 60 days of study period (M=90.13) at .05 level of statistical significance.

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