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Impact of diet recommended in naturopathy centers on the nutritional status of essential hypertensive patients

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Abstract
The patient suffering from hypertension are now a days prefer to get themselves treated from naturopathy centers. Therefore the present study has been under taken to see the effectiveness of diet prescribed by naturopathy center on the nutritional and health status of the patients. In naturopathy center patient were doing meditation, yoga, sun, air water and mud therapy and were given hypo caloric diet. For the purpose of study 30 hypertensive male and equal number of female were selected from naturopathy center namely Prakritik Jeevan Kendra, Pattikalyana, G.T. Road, Panipat and Navneet Prabhakar Yog Chikitsa Dham, Bassi, Jaipur, Rajasthan. Weight, height, glycemic status and lipid profile was measured as well as BMI,WHR and nutrient intake was calculated before and after getting the treatment from naturopathy center. Treatment from naturopathy center was effective in reducing the weight (male 8.79; female 10.84 per cent) and BMI (from 25.16 to 22.95 in male and 28.07 to 25.065 in female). Percentage reduction as compare to RDA of carbohydrate, energy, protein and fat intake in male subjects was 39.3, 27.11, 46.24, 177.27 per cent. Corresponding values for female were 28.41, 40.46, 39. 98, 137. 71 per cent. Contrary to the intake of carbohydrate, energy and fat, Vitamin C intake increased by six folds, Vitamin A turned twice, iron intake too raised in both male and female subjects, because of this hemoglobin moved up significantly at both levels($P \geq .01$) and total cholesterol, LDL, VLDL, Triglyceride and blood Glucose level decreased by 29.72,29.91,16.74 and 46.66 percent. Corresponding reduction in female was 32.96 39.40, 17.6 520.24 and 49.91 percent. So, naturopathic treatment is a powerful weapon to combat obesity as well as regulating the blood pressure, controlling lipid profile, maintaining and improving the nutritional status of the patients.

Keywords: Naturopathy center, nutritional status, essential hypertensive patients

Introduction
Hypertension, a curse of modern society is the precursor of several cardiovascular disorders and gives birth to fatal coronary lesions if not treated well in time. About 80 per cent of hypertensive patients have one or more risk factors like dyslipidemia, glucose intolerance, obesity and ventricular hypertrophy. According to Joint National Committee VII criteria the prevalence of hypertension and pre-hypertension was 27.7 and 56.3 per cent, respectively and this increases with the age. Hypertension may be cropped up as a result of sedentary life style, excessive alcoholism, smoking, overeating and fast pace of tension loaded life.
Normally changes in life is the golden rule in the prevention and even cure of such ailments. Naturopathy completely and successfully encompasses all these factors
i. e., it attacks all culprits responsible for hypertension. Davidson considers naturopathy responsible for removal of ill health altogether by living according to the laws of nature. In India, various naturopathy centers have been set up for treating the patients suffering from hypertension and heart related diseases. Therefore, The present study has been taken with the objective to assess the adequacy of diet prescribed by naturopathy centre on the health and nutritional status of hypertensive patients enrolled in naturopathy centers and to whom were recommended a treatment of one month were selected for the purpose of study.

Materials and Methods
By purposive sampling technique, 30 hypertensive male and equal number of hypertensive female who enrolled themselves in naturopathy centers for The treatment of hypertension were selected from naturopathy centers namely - Prakritik Jeevan Kendra, Pattikalyana, G.T. Road,

Panipat and Navneet Prabhakar Yog Chikitsa Dham, Bassi, Jaipur, Rajasthan. The age of the subjects was between 40-60 years. This treatment was done in naturopathy centers for one month In naturopathy centers subjects were doing yoga (i.e. exercise and pranayam). Along with this they were undergoing mud, water and diet therapies accordingly. They were given herbal tea, honey amla water or bottle guard juice to drink in fasting state according to their adjascent complications.

The general information pertaining to age, income, occupation, educational qualification, activity pattern, cooking practices and food habits of each subject was collected through self-structured pre tested questionnaire.

Meal pattern and intake of each subject as before and after attending the naturopathy center for one month for treatment was established by 24 hr recall method for three consecutive days. Total amount of raw & cooked food in the family was also noted during this duration. Based on the above data, the amount of raw food consumed by each subject was calculated as follows:

$$\text{Total amount of Raw food consumed} = \frac{\text{Total amount of raw food used in the family for cooking}}{\text{Total amount of food cooked by using the raw food material}} \text{ x}$$

By the subject

Their nutrient intake was compared with the Recommended Dietary allowances given in Nutritive value of Indian Foods.

Food Intake: Plenty of seasonal fruits and controlled fluid intake was recommended. They took bottle guard juice in fasting state and then herbal tea after 2 hours of it. They were provided cow milk once a day.

4. Anthropometry: Height, weight, waist and hip circumference of each subject was measured by using the method of Jeliffe (1996) [11] before and after naturopathic treatment. BMI and WHR were was calculated before and after the treatment of each subject by using the method of James *et al* (1988) [8] respectively as follows:

$$\text{BMI} = \frac{\text{Weight (kg)}}{(\text{Height in meters})^2}$$

$$\text{WHR} = \frac{\text{Waist in Cm}}{\text{Hip in Cm}}$$

The subjects were graded as per normal values and standardized tables.

Biochemical Profile

Hb, and serum glucose was measured by cynomethemoglobin and Enzymatic GOD-POD method, respectively. Lipid profile i.e., TC and HDL of the subject was determined from the fasting blood serum sample before and after the experiment by using the CHOD-PAP enzyme reaction, LDL and VLDL was calculated by using Fredrickson's farmula, while triglyceride was determined by using GPO-PAP-ESPAS method.

Statistical Analysis: data for height, weight, BMI, WHR and lipid profile was statistically analysed to calculate the mean, S.D. and paired t test was used for difference of significance.

Results and Discussion

Anthropometry: mean weight of the male and female subjects was 71.29 and 67.029 kg and BMI was 25.16 and 28. 07, WHR 1.038 and.942 respectively, which was above the ICMR standards.

Analysis of data further reveal that before joining the naturopathy center maximum subjects were at the risk of obesity and were the obese of 1category (male 30%; female 19.8%) and category 2 obese (male 13.2%; female 6.6 %).Overall subjects having below normal BMI (<18.5) were 6.6 per cent and only 16.6 percent subjects were falling under normal BMI range (18.5 to 22.9).

However, A major chunk of subjects who were the victim of obesity, reported to have a feeling of fitness after joining naturopathy center. The subjects having below

Normal weight were increased from 6.6 to 13.33 per cent, which is beneficial for

Better blood pressure control. Initially 16.6 percent were under the normal BMI category (i.e. 18.5-24.9), which increased up to 23.32 percent after one month of treatment. This is due to summative effect of vegetarian diet, yogasana and pranayam. Hence naturopathic treatment was found effective in reducing the BMI of obese subjects.

Haemoglobin Level: The mean haemoglobin level of the subjects also moved up significantly from 12.86 to 13.54-for male and 10.94 to 11.78 per cent for female, respectively. Which is significant ($P \leq .01$) at both levels.

Fasting Blood Glucose Level: Blood glucose level has reduced nearly 21.25 percent (male19.94 and female 22.56 per cent) which shows establishment of better glycemic control. This may be due to hypo caloric fiber rich diet intake. This indirectly have an impact on the lipid profile also.

Lipid profile: Total lipid profile was higher in Female subjects as compare to male barring level of HDL which was lower in female than their male counter parts. The value for TC, LDL, VLDL and TG in female were 226.44, 145. 42, 32. 64 and 162.68 mg/dl and in male 194. 20, 124. 61, 27.03 and 134. 86 mg/dl, respectively before getting naturopathic treatment.

Thus, female hypertensive subjects were having a little bit risky lipid profile than male. However, after getting naturopathy treatment, the per cent reduction in lipid profile TC, LDL VLDL and TG except HDL was 21.80, 32.37, 3.67 and 8.79 per cent for male and 18.33, 30. 77, 3. 52 and 11 percent for female, respectively. The percent reduction in lipid profile was found significant.

However, HDL level increased from 40 to 40.23 in male and 40.16 to 40.90 in female. This rise was found significant at both levels ($P \geq .01$)

Nutrient intake: Before attending naturopathy center mean energy (kcal), protein (gm), calcium (mg), iron (mg), β carotene (mg), vitamin C(mg), carbohydrate (gm), fiber (gm), fat (gm), sodium (mg), potassium (mg) intake was 1346.97,64.79,281.02,13.06,1243.44,44.88,255.62,9.08,40.54, 1370, 1354 in female and corresponding intake in male subjects was 1576. 83, 72. 96, 678. 33, 16. 52, 1435. 2, 66. 134, 221. 44, 10. 48, 49. 05, 1420, 1401. The mean intake of energy, carbohydrate, fat and vitamin C was more than RDA and protein, fiber, vitamin A, iron, sodium and potassium was below RDA before attending naturopathy center. However during treatment in naturopathy center the intake of food condensed in energy were reduced but fruits and vegetable intake by both male and female has increased the vitamin C intake by six folds. Calcium intake is below RDA for female subjects and above RDA for male subjects but was above

required level at naturopathy center opathy center. Although iron intake has increased considerably but still below RDA, supported by high vitamin C in the diet of all subjects enhanced the haemoglobin level in all subjects. Due to amplified intake of antioxidant nutrients like vitamin C, fiber, β carotene hypocholestrolemic effect was evident from the collected data. Fiber intake was increased nearly twice in which soluble dietary fiber may be responsible for the fasting blood glucose reduction and lipid profile arrival close to normal range.

Conclusion

Results of the present study advocate food therapy in naturopathy center treatment as reliable tool for effective weight reduction and blood glucose regulation by changing their food habits and incorporation of healthful food stuffs in their dietary resume. Since nutrition and dietary pattern of individual is an emerging field of interest in dietetics more studies pertaining to vegetarian diet, yoga and meditation. Findings of the study are firmly based upon the intake of only satvik (natural and simple free from any kind of strong chemicals may be natural or synthetic) food in limited quantity so as to serve dual purpose of weight reduction and blood pressure regulation, lipid profile correction, cleansing and strengthening of physiology as a whole.

Table 1: Mean Nutrient intake of subjects before and during treatment

Sr No.	Nutrient	Female (n=30)				Male (n=30)			
		At Home		At Naturopathy Center		At Home		At Naturopathy Center	
		Mean Actual intake	% RDA	Mean Actual intake	% RDA	Mean Actual intake	% RDA	Mean Actual intake	% RDA
1	Energy(Kcal)	1346.971	105.725	886.65	69.59396	1576.833	108.095	986.71	67.64093
2	Protein(gm)	64.79	96.66	36.794	54.89266	72.96175	102.345	40.21	56.40342
3	Ca(mg)	281.02	70.255	566.56	141.64	678.33	169.5825	578.75	144.6875
4	Fe(mg)	13.06	43.53	23.969	79.89667	16.5228	59.01	27.11	96.82143
5	Vit A(mg)	1243.44	51.81	3271.3	136.3042	1435.2	59.8	3280.32	136.68
6	Vit C(mg)	44.88	112.19	288.51	721.275	66.134	165.335	289.7	724.25
7	Carbohydrate	255.62	100.135	159.645	62.53721	221.4439	99.32	184.23	82.62917
8	Fiber	9.08	22.7	14.045	35.1125	10.48	26.2	14.045	35.1125
9	Fat	40.54	202.705	11.675	58.375	49.054	245.27	13.2	66
10	Sodium(mg)	1370.8+365.1	41.53	424.64	12.86788	1420.+479.8	43.03	430.73	13.05242
11	Potassium	1354 + 407.9	41.03	2102.95	63.72576	1401+436.8	42.45	2132.64	64.62545

Mean $\pm$ S D

Table 2: Mean Nutrient intake of subjects before and during treatment Mean $\pm$ S.D.

Table 2: Categorization of male and female subjects studied as per BMI (wt./ h^2) before and after joining naturopathy center

Classification	Category	Male (n=30)		Female (n=30)	
		Before naturopathic treatment	After naturopathic treatment	Before naturopathic treatment	After naturopathic treatment
Underweight	<18.5	2 (6.6)	4 (13.2)	2(6.6)	4(13.2)
Normal	18.5-22.9	6(19.8)	12(39.6)	4(13.2)	2(6.6)
At risk of obesity	23-24.9	9 (30)	6(19.8)	2(6.6)	8(26.4)
Obese 1	25-29.9	9(30)	6(19.8)	12(39.6)	8(26.4)
Obese 2	$\geq$30.0	4(13.2)	2(6.6)	10 (33.3)	8(26.4)

*Figure in parenthesis indicate percentages

Table 3: Total percentage (n=60)

Category	Before Joining naturopathy center	After getting naturopathic treatment
Under weight	4 (6.6)	8(13.33)
Normal	10(16.6)	14(23.32)
At risk of obesity	11(18.33)	14(23.32)
Obese 1	21(35)	14(23.32)
Obese 2	14(23.32)	10(16.6)

*Figure in parenthesis indicate percentages

Table 4: Percent change in the lipid profile of subjects after joining the naturopathy center

Lipid Profile	Male n=30	Female n=30	Total n=60
Total Cholesterol	34.44↓	18.33↓	21.80↓
HDL	.60↑	1.85↑	1.23↑
LDL	33.96↓	30.77↓	32.37↓
VLDL	3.81↓	3.52↓	3.67↓
Triglycerides	6.586↓	11↓	8.79↓
Blood Glucose (Fasting)	19.94↓	22.56↓	21.25↓

↓ Decrease
↑ Increase

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