Open Access Journal
International Journal of Nutrition & Lifestyle
http://doi.org/10.69859/ijnl.2024.v4i4004
ISSN: 2583-3499 (Online)
Volume 4, Issue 4, Dec 2024

Original Research Article

The Study of Nutritional Status of Hypertensive Patients

Meenakshi Mohanpuria* & Vishakha Singh

College of Community & Applied Sciences of Food Sciences,

Maharana Pratap University of Agriculture & Technology, Udaipur

Abstract

Hypertension is very much prevalent all over the world these days. Taking measures to manage hypertension is of utmost importance for a healthy life of mankind. The current investigation was done on 30 hypertensive patients at the Mahatma Gandhi Medical College and Hospital, Jaipur. This study revealed that adults between the ages of 30 to 75 years were more likely to develop hypertension. The study also discovered that men experience it more frequently than women. In this investigation, majority of the patients had clinical symptoms and signs including weakness. Nearly all of the patients were obese. Most of them experienced weight gain between 5 to 10 kg in addition to headache, exhaustion, vomiting and back and shoulder pain. Chronic renal disease, cardiomyopathy, diabetes and coronary artery diseases were a few disorders connected to hypertension that can develop if it is not managed for a long time. High levels of stress and poor eating habits were also linked to hypertension. Many patients' blood pressure continues to rise even after being diagnosed with hypertension as a result of not following the right diet because they were unaware of the type of diet to be consumed in order to stay healthy.

Keywords

Hypertension, heart attack, heart failure, hemorrhagic stroke, eclampsia

***Correspondence**
Ms. Meenakshi Mohanpuria
meenakshimohanpuriya2000@gmail.com
College of Community & Applied Sciences of Food Sciences,
Maharana Pratap University of Agriculture & Technology, Udaipur

Received: 20 September 2024 - Accepted: 26 November 2024 - Published: 29 December 2024

Citation for the paper: Mohanpuria M, Singh V. The Study of Nutritional Status of Hypertensive Patients. International Journal of Nutrition & Lifestyle 2024; 4(4): 220 - 231. DOI: 10.69859/ijnl.2024.v4i4004

ISSN: 2583-3499 (Online)
Volume 4, Issue 4, Dec 2024

Introduction

Many degenerative diseases and health complications can be prevented if hypertension (HTN) is managed timely. Hypertension is likely to affect 1.58 billion adults population globally by 2025. Worldwide, 26% of the adults are known to have hypertension. Hypertension is a major risk factor of mortality and morbidity due to it's high prevalence. In India, 57% of the stroke mortality and 24% of cardiac deaths are attributed to hypertension. It is research proven that a decrease of 2 mm Hg in blood pressure can decrease mortality to a significant level. Despite such a high level of prevalence nationwide, there is no such study that represents pan India level disease burden and treatment outcomes. Some researches on small segments have been performed and reported management of hypertension (D'AgostinoSr et al., 2008).[1] Hypertension may be of many types such as portal hypertension and pulmonary hypertension. Blood pressure ≥25 mm Hg at rest in pulmonary artery is identified as pulmonary hypertension (Marius et al., 2013).[2]

Blood pressure response to dietary modifications in free-living individuals -

Effect of different types of diets was studied on hypertension by Wang et al. (2008). One diet was rich in fibre in form of fruits and vegetables. Low fat dairy foods were also included in this type of diet. Another diet was calcium rich included low-fat dairy products, moderate-sodium and high-potassium. Two test diets were given to the subjects for 4 weeks [3].

Hypertension and exercise

Today sedentary lifestyle is very common in urban society that is leading to cardiovascular and other diseases. Aerobic exercises are found to improve hypertension.

ISSN: 2583-3499 (Online)
Volume 4, Issue 4, Dec 2024

Blood pressure can be reduced by several mechanisms. Ruivo et al. (2012) [4] studied various aspects of body in response to exercise in hypertensive patients.

Hypertension: Trends in prevalence, incidence and control

Hajjar et al. (2006) also studied prevalence of cardiovascular diseases in relation to hypertension. Population data revealed that before 1990, prevalence of hypertension was decreasing, but after that, it showed a rising trend again. The study revealed a 15% increase in the rate of incidence of hypertension that depends on age, gender, ethnic background and body build of the people. Control rate is very low even after the drastic rise in incidence rate of hypertension.

Objective

- To study nutritional status of hypertensive patients

Research Methodology

Research methodology has been divided into following phases:

Phase 1 Collection of general information of the patients

In this part of the study, respondent's name, age, sex, place, education status, working status, activity pattern, economic status, and marital status etc.

Phase 2 Assessment of nutritional status

Nutritional status was assessed by following various steps like anthropometry, biochemical parameters, clinical signs and symptoms and diet intake.

2.1 Anthropometric measurements:

Weight was taken using digital weighing balance by following standard guidelines of taking weight with minimum clothing and without shoes.

Height: Height was taken using Height. Patients were asked to stand without shoes/ foot wears and without any puffy hair style. It was done on a flat surface.

ISSN: 2583-3499 (Online)
Volume 4, Issue 4, Dec 2024

Waist circumference: It was done by a non stretchable measuring tape just above the iliac crest.

Hip circumference: It was also measured using a measuring tape just as waist circumference but at maximum periphery of hips.

MUAC: Mid upper arm circumference was measured as the circumference of themed point between olecranon and acromion process.

BMI: BMI was calculated as per following formula:

Weight (Kg)/Height (m^2)

Waist/ hip circumference ratio (WHR): After measuring waist and hip circumference, its ratio was calculated to find out type of fat distribution in body.

2.2 Biochemical parameters

Data was recorded from patient's file for following biochemical reports to assess their biochemical status for sodium, potassium and blood pressure.

2.3 Clinical signs and symptoms

These were noted for presence of any signs such as headache, irritation, weakness, shortness of breath, constipation, diarrhea, fatigue, vomiting and nausea.

2.4 Nutrient intake

It was recorded using a 24 hours home diet recall. Empty calories intake was also noted using a questionnaire.

Phase 3 Nutritional diagnosis

Patients were categorized under following heading as per subjective global Assessment (SGA) tool

- Normally nourished / healthy
- Mildly undernourished/at risk of malnutrition
- Severely malnourished

ISSN: 2583-3499 (Online)
Volume 4, Issue 4, Dec 2024

Phase 4 Nutritional Intervention

After assessment and diagnosis, patient's nutrition intervention was planned as per their requirements. Requirements were calculated as 25-30 Kcal/ kg IBW and 1 g / kg protein was planned. To address the problem of hypertension, "DASH" DIET (Dietary approach to stop hypertension) was followed to prescribe diet to patients as per following guidelines:

- Two-three g salt throughout the day
- Reduce the use of spinach and malta
- Avoid pickle/ papad /chutney/ namkeen
- Avoid foods containing baking powder/ baking soda/ ENO and preservatives
- Avoid processed salty foods and red meat
- Avoid alcohol and saturated fat
- Avoid processed and prepackaged foods

Foods that can be consumed freely are as per following dietary recommendations –

- Low fat milk/ buttermilk/curd etc.
- Citrus fruits like – Amla, lemon, orange, coconut water
- Whole grains, cereals, millets, whole pulses
- Fresh fruits and vegetables as salad

Results & Discussion

This segment of the study has been divided as per the bifurcation done in research methodology section only. The data collected was as reported below –

- General information of the patients with co-morbidities

S.No.	Age	Gender	Education status	Occupation	Activity pattern	Economic status	Marital status	Diagnosis
1.	48	Male	Metric	Working	Moderate	MIG	Married	HTN/ Jaundice/ Ascitis
2.	60	Male	Illiterate	Work ing	Moderate	MIG	Married	HTN/ T2DM

ISSN: 2583-3499 (Online)
Volume 4, Issue 4, Dec 2024

3.	40	Male	Metric	Working	Moderate	MIG	Married	HTN/AOCD/ Post RAR/ AKI/ Hypernatremia
4.	28	Male	PG	Working	Heavy	HIG	Unmarried	HTN/ CKD/ AKI/ CLD
5.	78	Male	Illiterate	Working	Sedentary	HIG	Married	HTN/ IBD/ UC/ T2DM
6.	48	Female	Metric	Working	Moderate	HIG	Married	HTN/ AKI/ COPD
7.	46	Male	Metric	Working	Moderate	HIG	Married	HTN
8.	55	Male	Metric	Working	Moderate	MIG	Married	HTN/ AKI/ DM2
9.	73	Male	Graduate	Working	Sedentary	MIG	Married	HTN/ DM2/ LRTI
10.	56	Female	Illiterate	Working	Moderate	LIG	Married	HTN/ HE
11.	68	Male	Graduate	Not working	Heavy	LIG	Married	HTN/ DM2/ CHF
12.	28	Male	Metric	Working	Moderate	MIG	Married	HTN/ CKD MHD/ SEPSIS
13.	53	Female	Metric	Working	Moderate	MIG	Married	HTN/ CKD HD
14.	72	Female	Metric	Not working	Sedentary	MIG	Married	HTN/ T2DM/ Pancreatitis
15.	45	Female	Metric	Working	Moderate	MIG	Married	HTN/ ITP/ Thrombocytopenia
16.	70	Female	Illiterate	Not working	Moderate	LIG	Married	HTN/ CKD/ HD/ T2DM
17.	70	Female	Metric	Not working	Moderate	HIG	Married	HTN/ DM2/ Hypothyroidism
18.	65	Female	Metric	Working	Moderate	MUG	Married	HTN/ DM2/ Hypothyroidism
19.	58	Female	Illiterate	Working	Moderate	MIG	Married	HTN/ CA BREAST/ T2DM
20.	70	Female	Metric	Not working	Moderate	HIG	Married	HTN/ PTB
21.	49	Female	Graduate	Working	Heavy	HIG	Married	HTN/ DM2/ AKI/ Hypothyroidism
22.	39	Female	Graduate	Working	Moderate	MIG	Married	HTN/ Seizures
23.	30	Female	PG	Working	Moderate	HIG	Married	HTN/ CVA
24.	71	Female	Metric	Not working	Moderate	MIG	Married	HTN/ DM2
25.	38	Female	Graduate	Working	Moderate	MIG	Married	HTN/ DM2/ Seizures
26.	40	Male	Graduate	Working	Moderate	MIG	Married	HTN/ DM2

ISSN: 2583-3499 (Online)
Volume 4, Issue 4, Dec 2024

27.	72	Male	Metric	Not working	Sedentary	LIG	Married	HTN/ CKD HD/ DM2
28.	32	Male	Graduate	Working	Moderate	HIG	Married	HTN/ CVA/ DM2
29.	60	Male	Metric	Not working	Moderate	MIG	Married	HTN/ Acute pancreatitis
30.	54	Male	Metric	Not working	Moderate	MIG	Married	HTN/ CKD HD

Table 1: General information of the patients

Patient's general information included information regarding age, gender, education, working status, economic status, marital status and presence of co-morbid conditions. In present study, out of 30, 15 patients were male, while 15 were female. It showed that problem of hypertension is equally observed in both genders. Forty three percent patients were in the age group of 25-50 year and 40 % patients were found to be 51-70 year and. Sixteen percent patients were found to be 71-90 years. Educational status shows that 56.66 % most of the patient were educated till metric and 23.33 percent were found to be graduate, while 6.66 percent were post graduate. Seventy percent patients were found to be working. When activity pattern was studies it was found that 10% patients were sedentary workers, 80% patients were moderately active and 10% patients were heavy workers. Marital status showed that 96.66% patients were married.

2. Nutritional status

2.1. Anthropometric Measurement

Parameters	Number of males (N = 15)	Percentage (%)	Number of females (N = 15)	Percentage (%)
Mean height (cm)	163.66	24	158.31	23.74
Mean Weight (kg)	59.86	9	61	9.15
Mean BMI (kg/m2)	22.32	3	24.38	3.65
Mean MUAC (cm)	27.13	4	26.81	4.02
Mean waist Circumference (cm)	86.66	13	91.12	13.67
Mean Hip Circumference (cm)	95.4	14	100.68	15.10

ISSN: 2583-3499 (Online)
Volume 4, Issue 4, Dec 2024

Mean Waist/Hip	0.90	1	0.9	1

Table 2: Anthropometric Measurements

Table 2 is showing that mean height of males was 163.66 cm, while mean height of females was 158.31 cm. Mean weight was 59.86 kg and 61 kg for males and females respectively. Bmi for males was normal while females were found in the overweight category. Mean waist to hip ratio was also found on slightly higher side.

2.2 Biochemical / biomedical profile of hypertensive patients

Parameters		Total number of Patients N=30	Percentage (%)
Na (mg/dL)	118-135 136-150	16 14	53.33 46.66
Potassium (mg/dL)	3.1-4.0 4.0-5.5	21 9	70 30
BP(mmHg)	95– 145 146-190	16 14	53.33 46.66

Table 3: Biochemical/ biomedical profile of hypertensive patients

Fifty three percent of the patients had Na 118-135 mg/dL which is much lower than the normal value and 46.66 % patients showed Na 136-145 mg/dL which was in the normal range. Seventy percent patients were in the normal range of Potassium 3.1-4.0 mg/dL and 30 % patients showed Normal to High value of blood pressure. Mean sodium and potassium values were 133.88 mmol/L and 3.9 mmol/ L respectively.

2.3 Clinical signs and symptoms of hypertensive patients

Parameters		Total number of Patients N = 30	Percentage (%)
Nausea	Yes No	14 16	46.66 53.33

ISSN: 2583-3499 (Online)
Volume 4, Issue 4, Dec 2024

Vomiting	Yes	13	43.33
	No	17	56.66
Headache	Yes	5	16.66
	No	25	83.33
Constipation	Yes	10	33.33
	No	20	6.66
SOB	Yes	13	43
	No	17	56
Weakness	Yes	30	100
	No	0	0
Diarrhea	Yes	5	13.33
	No	25	86.6
Stress	YES	24	80
	NO	6	20

Table 4: Clinical signs and symptoms in hypertensive patients

Problem of vomiting, nausea, weakness etc. were found in all patients. Forty six percent patients showed symptoms of nausea, 43.33 % faced the problem of vomiting, 16.66 % patients suffered from headache, 33.33 patients were having constipation,100% patients felt symptoms of weakness,13.33% patients are diarrhea and 80% patients reported that they had some or other type of stress.

2.4 Nutrients & Empty Calories Intake on the basis of 24 Hours Home Diet Recall

S. No.	Energy intake (%) (Kcal)	Requirement energy (Kcal)	Protein intake (%)	Requirement protein (g)	CHO (g)	Fat (g)	Fibre (g)	Na (mg)	K (mg)	Empty calorie intake
1	1280 (82%)	1550	60 (96)	62	192	35	39	118	1820	315
2	1369 (76)	1800	59 (98)	60	205	38	45	155	1930	320
3	2016 (+13)	1775	54 (77)	70	302	56	60	325	2250	350
4	1180 (65)	1800	45 (62)	72	177	32	35	276	1730	390
5	2280 (+26)	1800	75 (+1)	74	342	63	65	330	3050	415

ISSN: 2583-3499 (Online)
Volume 4, Issue 4, Dec 2024

6	2284 (81)	2800	80 (100)	80	342	63	65	325	3060	420
7	2155 (+11)	1925	75 (+13)	66	323	59	61	330	2298	390
8	1936 (+10)	1750	55 (78)	70	290	53	56	315	2140	350
9	1819 (86)	2100	72 (90)	68	272	50	51	300	2430	320
10	1224 (51)	2400	48 (68)	70	183	34	38	115	==1790	310
11	1819 (+15)	1575	72 (+5)	68	272	50	51	302	2250	320
12	2134 (+49)	1425	76 (+11)	68	320	59	61	322	2580	310
13	1989 (93)	2130	6 6(+6)	62	298	55	57	325	2280	290
14	2220 (+80)	1229	75 (+44)	52	333	61	59	319	2700	250
15	1819 (+32)	1375	75 (+13)	66	272	50	56	300	2250	360
16	1180 (78)	1500	7 2 (+33)	54	177	32	35	276	1730	300
s17	2155 (+53)	1400	7 5(+36)	55	323	59	60	330	2460	390
18	2073 (+59)	1300	68 (+9)	62	310	57	57	320	2260	350
19	1381 (100)	1375	54 (90)	60	207	39	36	157	1830	310
20	1227 (81)	1500	50 (83)	60	182	35	38	115	1260	330
21	1350 (+22)	1100	53 (80)	66	204	37	40	152	1930	350
22	1180 (95)	1250	45 (75)	60	177	32	32	276	1730	320
23	1390 (89)	1560	50 (80)	62	208	39	38	206	1930	340
24	2284 (+22)	1860	8 0(+29)	62	342	63	52	315	2950	400
25	1444 (+5)	1375	5 9(95)	62	216	40	38	289	2547	330
26	2073 (+50)	1375	68 (+3)	66	310	57	40	320	2380	360
27	1936 (+16)	1650	55 (83)	66	290	53	56	315	2240	350
28	1100 (66)	1650	45 (68)	66	165	30	38	216	1590	350
29	1989 (94)	2100	77 (91)	84	298	55	55	324	2360	390
30	1227 (75)	1625	48 (61)	78	182	35	42	115	1710	360

Table 5: Nutrient intake as per home diet recall (Nutrient requirement and % intake of the requirements have been mentioned in parenthesis)

Fifty percent people consumed more energy than the requirements, while 60% patients took less than required protein.

3. Nutritional Diagnosis

Patient's nutritional diagnosis was determined on the basis of their assessment, which was done on the basis of anthropometry, biochemical profile, clinical signs and diet intake. Following table 6 is showing the nutritional status of the patients -

ISSN: 2583-3499 (Online)
Volume 4, Issue 4, Dec 2024

Parameters	Total number of patients N= 30	Percentage (%)
Undernutrition	4	13.3
Normal	12	40
Overweight	12	40
Obese	2	6.66

Table 6: Nutritional diagnosis of hypertensive patients

Patients were categorized under following headings as per Subjective Global Assessment (SGA) tool. This table shows the findings that 40 % patients were normal (healthy)while 40% patients were overweight and 6.66% patients were obese.

Nutritional Intervention

Patients were provided diet prescription for DASH diet in order to make them aware of sodium rich foods, that they need to restrict in their diets and healthy food options or replacement options were also provided to maintain the blood pressure in the normal range.

Conclusion

From the study of collected data of 30 hypertensive patients, it was found that hypertension is found mostly in men and women of 25-50 years of age but it can occur at any age. Hypertension was also found in patients with heart disease, kidney disease, diabetes, who had not been treated for high blood pressure for many years, who did not take proper care of high blood pressure, as well as in the habit of consuming salty and fast foods. Along with this, high blood pressure was also found in some patients due to high stress and poor eating habits.

References

1. D'AgostinoSr RB, Vasan RS, Pencina MJ, Wolf PA, Cobain M, Massaro JM, Kannel WB. General cardiovascular risk profile for use in primary care: The Framingham Heart Study. Circulation, 2008; 117(6): 743–753

ISSN: 2583-3499 (Online)
Volume 4, Issue 4, Dec 2024

2. Marius MH, Bogaard HJ, Condliffe R, Frantz R, Khanna D, Kurzyna M, Langleben D, Manes A, Satoh T Torres F, Wilkins MR, Badesch DB. Definition and diagnosis of pulmonary hypertension. J. Am. Coll. Cardiol. 2013, 62 (25_Supplement): D42–D50

3. Wang Lu, Mason JE, Buring JE, Lee IM, Sesso HD. Dietary intake of dairy products, calcium and vitamin D and the risk of hypertension in middle aged and older women. Hypertension, 2008; 51(4): https://doi.org/10.1161/HYPERTENSIONAHA.107.107821

4. Ruivo JA, Alcantara P. Hypertension and exercise. Rev Port Cardiol. 2012; 31(2):151-8. doi: 10.1016/j.repc.2011.12.012.

5. Hajjar I, Kotchen JM, Kotchen TA. Hypertension: trends in prevalence, incidence, and control. Annu Rev Public Health, 2006; 27:465-90. doi: 10.1146/annurev.publhealth.27.021405.102132.