Original Research Article

Dietary Habits and Adherence to Dietary Approaches to Stop Hypertension in Adults with High Blood Pressure ~~at Internal Medicine Outpatient Clinic, Tanta University Hospitals~~

Abstract:

Context: Hypertension is a worldwide burden which causes severe complications. Dietary and lifestyle modifications are important for lowering high blood pressure.

Aim~~s~~: To identify the dietary intake and habits among hypertensive patients.

~~Settings and Design: This study was carried out in the Internal Medicine outpatient clinic in a University Hospital. It was a cross sectional study.~~

Materials and Methods: ***Design***: A cross-sectional study was used. ***Settings***: This study was carried out in the Internal Medicine outpatient clinic in a University Hospital. A pre-designed validated ***questionnaire*** was used to collect the necessary data. The study included 350 hypertensive ***patients*** who were subjected to nutritional assessment.

~~Statistical analysis used: Tabulation and analysis of data were performed by using (SPSS-V21). For quantitative data, the range, mean and standard deviation were calculated. For qualitative frequency or percentage were calculated.~~

Comment [DR.1]: It can be stopped?
It can be treated but n stopped.

Comment [DR.2]: Too long title

Comment [DR.3]: Its prefer to add the study design to the title (a cross-sectional descriptive study). But you must abbreviate it.

Comment [DR.4]: You can delete the setting from the title

Comment [DR.5]: You have only one aim

Comment [DR.6]: The study aim should be the same as the study title

To identify (Title)

Comment [DR.7]: Mentioned in the method part

Comment [DR.8]: Put the study design with the methods part

Comment [DR.9]: Not included in the abstract

Results: The studied patients, 50.3% were males and 49.7% were females, with mean age of 53.49±10.51 years. Unsuitable dietary intake compared to recommended daily intake was prevalent in most of the patients.

Conclusions: Bad dietary habits and poor adequacy of recommended daily intakes of different nutrients were found among the studied hypertensive patients.

Key-words: Hypertension, nutritional assessment, dietary intake

Key Messages: Dietary intake in hypertensive patients should be assessed to be corrected to help in control of blood pressure. Dietary habits and anthropometric measurements in hypertensive patients should be assessed to detect the possible causes of elevated blood pressure and try to correct it.

Comment [DR.10]: You must mention here the main results

Comment [DR.11]: Arrange keywords alphpitical

Text

Introduction:

Comment [DR.12]: Incomplete, you need to mention the previous studies background.

Globally, about 3.5 billion adults suffer from non-optimal systolic blood pressure levels (that is, >110–115 mmHg), and about 874 million adults have a systolic blood pressure of ≥140 mmHg. So, about fourth of the adults suffer from hypertension.(1)

Hypertension sometimes does not show any obvious early symptoms but may results in severe complications, so it is called 'the silent killer. (2) It is a high prevalent disease among the Egyptian population; 29.5% of the Egyptians suffered from it according to Egypt STEPS Survey 2017. (3)

Lifestyle healthy changes have its great effect in the prevention and control of hypertension. (4, 5) several studies show that nutrients as sodium, potassium, calcium, magnesium, fiber and fish oil affect blood pressure particularly in pre-hypertensive (SBP 120–139 mmHg and/or DBP 80–89 mmHg) or stage I high blood pressure (SBP 140–159 mmHg and/or DBP 90–99 mmHg). (6) This strategy would reduce the need for medications, its costs and side effects (7)

The aim of this work was to: Identify the dietary habits among hypertensive patients

Comment [DR.13]: See comment at abstract

Subjects and Methods:

Study design and setting: It was a cross-sectional descriptive study which was carried-out at Internal Medicine outpatient clinic in a University Hospital, from September 2019 to September 2020.

Study population: Hypertensive patients. The sample was a systematic random sample and it was calculated using Epi Info calculating program. It included 350 hypertensive patients.

Tool of the study: Data was collected via a predesigned questionnaire included four parts:-

a. Socio-demographic Data: related to age, sex, residence, marital status, occupation, level of education, and smoking, medical data and family history.

b. Dietary habits: such as number of daily meals, the main meal, snacks and drinking water,… etc.

c. Measuring of blood pressure: it was measured on the resting participants left arm with a mercury sphygmomanometer in sitting position. Two readings were recorded and the mean of them was taken.

d. Nutritional Assessment: included anthropometric Assessment: including *Weight and height*, dietary Assessment: using 24-hour dietary recall and food frequency questinnaire.

Methods or procedure:

Manipulation of data: Nutrient intake analysis was done in the Egyptian National Nutrition Institute. Statistical Package for Social Sciences version 21 (SPSS-V21) was used. P<0.05 was adopted as the level of significance.

Comment [DR.14]: If you mentioned here Subjects and Methods also, mentioned the same at Abstract.

Comment [DR.15]: Mention some details about the sample

Comment [DR.16]: Write here confidence level, also, version of Epi-info program used?

e.g., It was calculated by Epi-Info version …….. with a 95% confidence level using the sample size equation for estimation of single proportion. The optional sample size was ……. The actual sample increased to 350 hypertensive patients to compensate any dropout.

Comment [DR.17]: Its important part of any study you should mentioned here in details:
Ethical consideration,
Tool validity and reliability,
Pilot study,
Field of the work, and so on.

Comment [DR.18]: You must mention here the statistical tests used in your study.

Administrative and ethical considerations: Official permissions for conduction of the study were obtained. Research ethical rules applied in Tanta Faculty of Medicine were taken in consideration throughout the implementation of this study.

Results:

The socio-demographic data of the studied hypertensive patients was presented in table (1) as follows, 50.3% of the studied patients were males and 49.7% were females, with a mean age of 53.49±10.51 years. Three fourths of patients were married. 35.7% of patients received secondary school or technical diplomas. About half of the patients were from rural areas. 22.3% of patients were current smokers.

Table (1): Sociodemographic characteristics and smoking status of studied hypertensive patients

Variables		Frequency (n=350)	
		No.	%
Sex	Male	176	50.3
	Female	174	49.7
Age in years	25-	81	23.1
	45-	227	64.9
	65-	42	12
	Mean±SD	(53.49±10.51)	
Marital status	Married	265	75.7
	Unmarried	85	24.3
Educational level	Illiterate (neither read nor write)	72	20.6
	Primary, preparatory	58	16.6
	Secondary and technical diplomas	125	35.7

Variables		Frequency (n=350)	
		No.	%
	University or postgraduate	95	27.1
Residence	Rural	173	49.4
	Urban	177	50.6
Smoking	No	234	66.9
	Ex- smoker	38	10.9
	Current smoker	78	22.2

Table (2) presented family and medical history of the studied hypertensive patients. Most of the studied patients had positive family history of hypertension. 31.4% of the patients were discovered accidently. Half of the patients suffered from hypertension for a period less than 5 years. The majority of them (92.6%) were regularly receiving their hypertension treatment, and about half of them (47.1%) suffered from chronic diseases (mainly DM 35.1%).

Table (2): Family history and medical data of studied hypertensive patients

Variable		Frequency (n=350)	
		No.	%
Family history of hypertension	Yes	260	74.3
	No	90	25.7
Mode of diagnosis	After feeling symptoms	240	68.6
	Accidently	110	31.4
Duration of illness in years	<5	176	50.3
	5-	128	36.6
	≥15	46	13.1
Receiving treatment for hypertension regularly	Yes	324	92.6
	No	26	7.4
Suffering from other chronic diseases	No	185	52.9
	Yes (DM)	123	35.1
	Yes (other than DM)	42	12

Dietary habits of the studied hypertensive patients were presented in table (3). The number of meals per day; 61.7% usually took ≥ 3meals, the main meal daily was lunch (78.9%), 90.3% of them ate snacks between meals, the most commonly eaten snacks included fresh fruits and vegetables (77.1%) followed by sweetened hot drinks (70.9%). 68% of patients consumed more than 7 cups of water per day and 61.1% of patients consumed 3 to ≤ **7** tea spoons of sugar.

Table (3): Dietary habits of the studied hypertensive patients

Determinants		Frequency (n=350)	
		No.	%
Number of usually taken meals / day	1-	134	38.3
	≥ 3	216	61.7
The main meal daily	Lunch	276	78.9
	Breakfast	42	12
	Dinner	32	9.1
Eating light meals between the main meals	Yes	316	90.3
	No	34	9.7
Type of light food (snacks)	Fresh fruits or vegetables	270	77.1
	Sweetened hot drinks	248	70.9
	Soft drinks	66	18.9
	Sweets or chocolate	46	13.1
	Ready crackers	21	6
	Others	4	1.1
	Fatty fast food	2	0.6
Cups of water / day	<7	112	32
	≥ 7	238	68
Free sugar (tea spoons /day)	0-	84	24
	3-	214	61.1
	≥ 7	52	14.9

Anthropometric measurements and blood pressure measurements were presented in table (4), the mean BMI of the studied patients was (35.40±7.10 Kg/m^2) which revealed that only 6.6% of patients were normal, 17.1% were overweight , 27.7% were obese class I, 26.9% were obese class II and 21.7% were obese class

III. As regards the blood pressure of the studied patients the means of systolic and diastolic blood pressures were 139.20±14.64 and 89.86±8.38 mmHg respectively.

Table (4): Anthropometric measurements and blood pressure of the studied hypertensive patients

Anthropometric and blood pressure measurements (n=350)		
BMI (kg/m2)	Mean±SD Median Range	35.40±7.10 34.72 20.55-54.69
BMI classes	Normal Overweight Obese class I Obese class II Obese class III	23 (6.6%) 60 (17.1%) 97 (27.7%) 94 (26.9%) 76 (21.7%)
SBP (mmHg)	Mean±SD Median Range	139.20±14.64 140.00 120-180
DBP (mmHg)	Mean±SD Median Range	89.86±8.38 90.00 80-110

The daily dietary intake of different nutrients was presented in table (5)**,** mean water, protein ,fiber, potassium, calcium and magnesium intakes were less than recommended, while mean total calories intake, fat, carbohydrate and sodium intakes were higher than recommended.

Table (5): Daily dietary intake of different nutrients in the studied hypertensive patients

Nutrients	Daily intake (mean±SD)	Recommended daily intake (mean±SD)
Water(milliliters)	1845.14±788.68	2607.60±333.81
Energy(calories)	2256.6200±575.66	1951.72±236.95
Protein(gram)	69.77±28.48	87.82±10.66
Fat(gram)	85.25±23.71	58.55±7.11
Fiber(gram)	19.21±3.86	25-38
Sodium	3165.25±621.43	2400

Nutrients	Daily intake (mean±SD)	Recommended daily intake (mean±SD)
Potassium	1730.14±842.61	4700 (2000-6000)
Calcium	684.37±261.81	1000-1200
Magnesium	119.19±51.50	320-420

Table (6) illustrated over intake of energy, fat, carbohydrates and sodium and inadequate intake of water, protein, fibers, potassium, calcium and magnesium.

Table (6): Level of intake of different nutrients among the studied hypertensive patients

Comment [DR.19]: You can show it in figure

Intake adequacy of different nutrients		Frequency (n=350)	
		No.	%
Water	Under-intake	236	67.4
	Adequate	45	12.9
	Over-intake	69	19.7
Energy	Under-intake	7	2.0
	Adequate	97	27.7
	Over-intake	246	70.3
Protein	Under-intake	170	48.6
	Adequate	96	27.4
	Over-intake	84	24.0
Fat	Under-intake	8	2.3
	Adequate	32	9.1
	Over-intake	310	88.6
Fiber	Under-intake	274	78.3
	Adequate	72	20.6
	Over-intake	4	1.1
Carbohydrate	Under-intake	39	11.1
	Adequate	92	26.3
	Over-intake	219	62.6
Sodium	Adequate	58	16.6
	Over-intake	292	83.4
Potassium	Under-intake	288	82.3
	Adequate	54	15.4
	Over-intake	8	2.3
Calcium	Under-intake	266	76.0

	Adequate	84	24.0
Magnesium	Under-intake	346	98.9
	Adequate	4	1.1

Discussion:

Comment [DR.20]: You should put your rationale regarding your study results.
Also, if there is and limitation of the study mention it.

As regards the sociodemographic data in this study; it was nearly similar with findings of a study conducted in Saudi Arabia where 56.3% were males and 52.3% were females (8) another study was conducted in Egypt where 64.2% of the patients were females and 35.8% were males their mean age was (44.6 ±12.2) years. (9)

As regards the educational level in this study in comparison to Walaa ELbaz et al., 2018 study; 149 (48%) patients were mild to moderate educated, while132 (42%) not educated and 31 (10%) patients were highly educated. (10)

In the current study 22.2% were smokers all of them were males which was relatively close to Ezzat et al., 2019 where 14.6% of males only were smokers.(9)

Three fourths of patients in this study had positive family history of hypertension the duration of illness ranged from less than one year to 30 years. Patients suffering from other co-morbidities were 47.1% (mainly diabetes 35.1%). In another study carried out in Nigeria on 510 patients in the outpatient clinics; family history of hypertension was present in 35.2% of the population. Patients who had other co-morbidities were 49.9% of patients; also diabetes was the most commonly associated state (27.9%). (11)

Concerning the dietary habits in comparison to another study which was carried out in a family health center in Alexandria City, Egypt to study diet approaches to stop hypertension “DASH” in control of hypertension. It showed that 55% of the studied patients usually taken three meals, the main meal daily was lunch (71%), most of them (62.7%) eat snacks between meals, sweets (57.3%), tea and

coffee (91.1%). More than three quarters (80.7%) take adequate amount of water sometimes. About half of them (49.3%) sometimes sleep directly after eating. (12)

In the current study the BMI revealed that only 6.6% of patients were normal, 17.1% were overweight, 27.7% were obese class I, 26.9% were obese class II and 21.7% were obese class III. In the study of EK Colecraft et al. (2018) 28.9% had normal BMI and 71.1% were overweight or obese. (13)

As regards the blood pressure of the studied patients the systolic and diastolic blood pressures were 139.20±14.64 and 89.86±8.38 mmHg respectively, while in the study of Margerison et al. 2020 the mean of systolic and diastolic blood pressures were 128.8 and 81.3 mmHg respectively. (14)

In the present study; low intakes of water, protein, fiber, potassium calcium, and magnesium, but high intakes of total calories, fat, carbohydrate and sodium were present. Similar to the findings of an Italian survey where total energy, fat, carbohydrates and sodium intakes were more than recommended, while protein, fiber and potassium intakes were much below the recommended dietary intake. (15)

Conclusion and recommendations:

Comment [DR.21]: This is an important part of any study, you must put your study conclusion and recommendations based on your study results.

References:

Comment [DR.22]: Be sure that all mentioned references here are present in the study and vice versa.

1. Forouzanfar MH, Liu P, Roth GA, Ng M, Biryukov S, Marczak L, et al. Global burden of hypertension and systolic blood pressure of at least 110 to 115 mm Hg, 1990-2015. Jama. 2017;317(2):165-82.
2. Mancia G, De Backer G, Dominiczak A, Cifkova R, Fagard R, Germano G, et al. 2007 Guidelines for the management of arterial hypertension: The Task Force for the Management of Arterial Hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). European heart journal. 2007;28(12):1462-536.
3. El Faramawy A, Youssef G, El Aroussy W, El Remisy D, El Deeb H, Aal AA, et al. Registry of the Egyptian specialized hypertension clinics: patient risk profiles and geographical differences. Journal of human hypertension. 2020;34(7):520-7.
4. Whitworth JA, Chalmers J. World health organisation-international society of hypertension (WHO/ISH) hypertension guidelines. Clinical and experimental hypertension (New York, NY: 1993). 2004;26(7-8):747-52.
5. Chobanian AV. The hypertension paradox—more uncontrolled disease despite improved therapy. New England Journal of Medicine. 2009; 361(9):878-87.
6. Nguyen H, Odelola OA, Rangaswami J, Amanullah A. A review of nutritional factors in hypertension management. International journal of hypertension. 2013; 2013.
7. Houston MC. Treatment of hypertension with nutraceuticals, vitamins, antioxidants and minerals. Expert review of cardiovascular therapy. 2007; 5(4):681-91.

8. Al-Nozha MM, Abdullah M, Arafah MR, Khalil MZ, Khan NB, Al-Mazrou YY, et al. Hypertension in saudi arabia. Saudi medical journal. 2007; 28(1):77.
9. Ezzat EM, Al Amir MA, Ewais AA. Pattern of Hypertension in Fayoum Governorate. Asian Journal of Medicine and Health. 2019:1-8.
10. Elbaz WF, Eissa SS, Mohamed RA, Aly NK, Reda TM. Essential Hypertension among Egyptian Adults. The Egyptian Journal of Hospital Medicine. 2018; 61(1):643-52.
11. Abimbola O, Ambrose I. Dietary habits of hypertensive patients in a tertiary hypertension clinic in southern Nigeria. Journal of Medicine and Biomedical Research. 2016; 15(2):23-33.
12. Nabil K, Atalla A, El-Deeb A, Mansour N. Diet Approaches to Stop Hypertension "DASH" in Control of Hypertension in Mandara Family Health Center in Alexandria City, Egypt (Master degree thesis, Tanta University). 2018: 37-9.
13. Colecraft EK, Asante M, Christian AK, Adu-Afarwuah S. Sociodemographic characteristics, dietary practices, and nutritional status of adults with hypertension in a semi-rural community in the Eastern region of Ghana. International journal of hypertension. 2018; 2018.
14. Margerison C, Riddell LJ, McNaughton SA, Nowson CA. Associations between dietary patterns and blood pressure in a sample of Australian adults. Nutrition journal. 2020; 19(1):1-12.
15. Guastadisegni C, Donfrancesco C, Palmieri L, Grioni S, Krogh V, Vanuzzo D, et al. Nutrients intake in individuals with hypertension, dyslipidemia, and diabetes: an Italian survey. Nutrients. 2020; 12(4):923.