

RISK FACTORS OF HYPERTENSION AMONG PATIENTS ATTENDING IBN SENA TEACHING HOSPITAL IN MOSUL

*Dr. Asmaa Sh. Aziz, Dr. Islam A. Al-Idrisi and Dr. Ammar H. Yahia

M.B.Ch.B F.A.B.H.S(F.M).

Article Received date: 20 October 2023

Article Revised date: 10 November 2023

Article Accepted date: 02 December 2023



*Corresponding Author: Dr. Asmaa Sh. Aziz

M.B.Ch.B F.A.B.H.S(F.M).

INTRODUCTION

According to the 1999 World Health Organization-International Society of Hypertension Guidelines for the Management of Hypertension, hypertension is defined as a systolic blood pressure of 140 mmHg or greater and/or a diastolic blood pressure of 90 mmHg or greater in subjects who are not taking antihypertensive medication.^[1] For subjects with diabetes mellitus, end organ damage or metabolic syndrome, blood pressure levels of 130/80 mmHg or greater are defined as hypertension.^[2,3]

Epidemiology

Hypertension is an important public health challenge, which affects approximately one billion persons worldwide.^[4] Because of increasing rates of obesity and aging of the population, hypertension has projected to affect 1.5 billion persons, one third of the world population, by year 2025.^[5,6] Each year at least 9.4 million people die as a consequence of hypertension.^[7] The overall average prevalence of hypertension in the world was estimated as 35% (37% in men and 31% in women).^[8]

Risk Factors for Hypertension

- Age
- Gender
- Race
- Family history
- Increase salt intake
- Physical inactivity
- Alcohol consumption
- Smoking
- Obesity
- Diet
- Diabetes mellitus
- Hypercholesterolemia
- Sleep duration
- Stress

Complications^[9]

Elevated blood pressure results in structural and functional changes in the vasculature and heart. Complications include

- Hypertensive Cardiovascular Disease

- Hypertensive Cerebrovascular Disease and Dementia
- Hypertensive Kidney Disease
- Aortic Dissection
- Atherosclerotic Complications

Aim of The Study

The aim of this study is to evaluate the main risk factors of hypertension in patients attending the outpatient clinics at Ibn Sena Teaching Hospital in Mosul.

Specific Objective

- To describe sociodemographic characteristics of the study population.
- To study the main risk factors of hypertension in the study population.
- To determine the relationship between high blood pressure and the identified associated risk factors in the adult population

Patients and methods Study setting

The present study was conducted in the medical outpatient clinics for internal medicine at Ibn Sena teaching hospital in Mosul city.

Study design

Case control design was adopted in order to achieve the objectives of the present study.^[10]

Study Period

It has been planned to collect data during six months period from 1st of October 2013 to the 1st of April 2014.

Study sample

The present study included 100 adult patients who attended the outpatient consultation clinics at Ibn Sena teaching hospital and diagnosed to have HTN, and 100 control subjects who attended the same consultation clinics, in whom evaluation proved not to have HTN

Data collection tool

A questionnaire form was specially prepared in order to collect all the relevant information related to the study

sample. the questionnaire contain detailed history of Age, gender, risk factors for HTN.

RESULTS

Figure (3.1) shows the age distribution of cases of HTN. It's clear from the figure that 25%, 35% of the cases were in the age group 49-58 years and ≥ 59 years respectively.

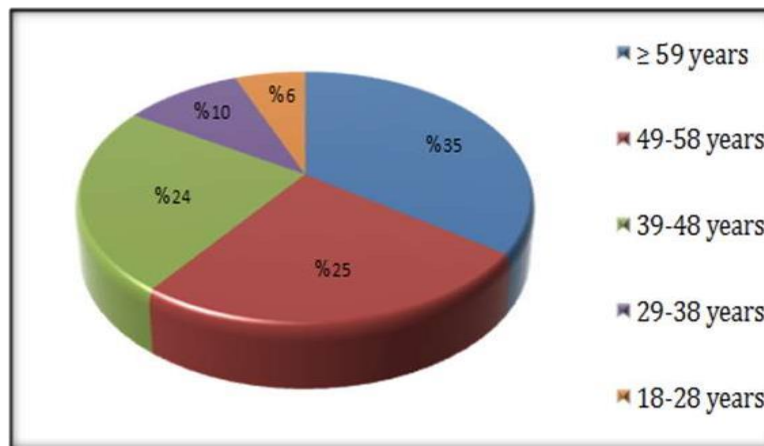


Figure (3.1): Age distribution of 100 cases with HTN.

3.1 The socio-demographic characteristics and occurrence of HTN

This study revealed that the highest frequency of HTN was found in the age group ≥ 59 years [35 patients (35%)] and the lowest frequency of HTN was observed in the age group 18-28 years [6 patients (6%)]. The differences in most of the age groups were statistically significant as shown in table (3.1).

More over table (3.1) also showed that HTN was more frequently seen among males than females (63 % & 37 % respectively), and (75%) of HTN cases were from urban areas in comparison to about (25%) from rural area. The study showed that 62% of cases and 78% of controls were married. The rest were either single,

divorced or widowed. Also showed that HTN was more frequently seen among widowed 25% of cases 12% of control (p = 0.018).

Regarding educational status it is clear from the table that 26% and 24% of the cases had university education and illiterateness respectively compared to 45% and 7% among the controls group respectively, the difference was statistically significant (p= 0.005, 0.001) respectively.

More over the table showed that 53% and 38% of cases and controls respectively were non employed, the difference was statistically significant (p= 0.033).

Table (3.1): The socio demographic characteristics and occurrence of HTN.

Age group (years)	Cases (n=100)		Controls (n=100)		P* -value
	%	No	%	No	
18-28	6	6	18	18	0.009
29-38	10	10	29	29	0.001
39-48	24	24	20	20	0.495
49-58	25	25	13	13	0.031
≤ 59	35	35	20	20	0.018
Gender					
Male	63	63	46	46	0.016
Female	37	37	54	54	
Residence					
Urban	75	75	62	62	0.048
Rural	25	25	38	38	
Marital status					

Single	3	3	7	7	0.194
Married	62	62	78	78	0.014
Divorced	10	10	3	3	0.045
Widowed	25	25	12	12	0.018
Education					
Illiterate	24	24	7	7	0.001
Primary	30	30	15	15	0.011
Intermediate	10	10	15	15	0.285
Secondary	10	10	18	18	0.103
University	26	26	45	45	0.005
Occupation					
Employment	21	21	35	35	0.027
Non employment	53	53	38	38	0.033
Private	9	9	9	9	1.000
Retired	17	17	18	18	0.852
Student	0	0	0	0	1.000

* χ^2 -test was used

Risk factors of HTN among the study population

Family history and the occurrence of HTN

Table (3.2) illustrates the association between family history of hypertension and the occurrence of HTN, the

table showed that 72% of the cases gave a positive family history of HTN compared to only 33% among the controls.

Table (3.2) Family history of hypertension and the occurrence of HTN.

Family history of HTN	Cases (n=100)		Controls (n=100)		OR	95% CI for (OR)	P*-Value
	NO	%	NO	%			
Present	72	72	33	33	5.221	2.862-9.525	0.0001
Absent	28	28	67	67			
Total	100	100	100	100			

* χ^2 -test was used

Increase salt intake and the occurrence of HTN.

History of high salt intake equal to 5gm /day or more was reported in 40% of the cases and 24% of the controls. More over table (3.3) depicts that there is

association between the occurrence of HTN and high salt intake (OR=2.111, 95%CI=1.152- 3.867) and the difference is statistically significant (P=0.015).

Table (3.3) high salt intake and the occurrence of HTN.

Salt intake	Cases (n=100)		Controls (n=100)		OR	95% CI For(OR)	P*-Value
	NO	%	NO	%			
≤ 5 gm/day	40	40	24	24	2.111	1.152-3.867	0.015
> 5 gm/day	60	60	76	76			
Total	100	100	100	100			

* χ^2 -test was used

Physical inactivity and the occurrence of HTN

Physical inactivity was reported by 63% of cases compared to only 40% of the controls see table (3.4). Also this table clarifies a significant association between

physical inactivity and the occurrence of HTN (OR=2.554, 95%CI=1.447-4.507) and the difference is statistically significant (P=0.001).

Table (3.4): Physical inactivity and the occurrence of HTN.

Physical inactivity	Cases (n=100)		Controls (n=100)		OR	95% CI For(OR)	P*-Value
	NO	%	NO	%			
> 150 min /week	63	63	40	40	2.554	1.447-4.507	0.001
≤150 min/week	37	37	60	60			
Total	100	100	100	100			

* χ^2 -test was used

Alcohol consumption and the occurrence of HTN.

It is clear from table (3.5) that only one of the cases found to consumpt alcohol, no one found to be alcoholic among the controls group.

Table (3.5): Alcohol consumption and the occurrence of HTN.

Alcohol consumption	Cases (n=100)		Controls (n=100)		OR	95% CI For(OR)	P*-Value
	NO	%	NO	%			
Present	1	1	0	0	Inf	0.260_ Inf	0.316
Absent	99	99	100	100			
Total	100	100	100	100			

* χ^2 -test was used

Smoking and the occurrence of HTN

This study showed the majority of cases 31% and controls 61% were non smokers, 28% of cases and 11% of controls were smokers, 24% of cases and 12% of controls were ex smokers. The table (3.6) shows that non

smoking plays a protective effect against hypertension (OR= 0.287, 95% CI= 0.161-0.514, P =0.0001), while smoker and ex smoker (OR= 3.146, 95%CI=1.482-6.668, p= 0.002, OR= 2.316,95%CI 1.096-4.883, p=0.027 respectively) seems to be a risk factor.

Table (3.6) Smoking habit and the occurrence of HTN.

Smoking Habit	Cases (n=100)		Controls (n=100)		OR	95% CI For(OR)	P*-Value
	NO	%	NO	%			
Non smoker	31	31	61	61	0.287	0.161-0.514	0.0001
Smoker	28	28	11	11	3.146	1.482-6.668	0.002
Ex smoker	24	24	12	12	2.316	1.096-4.883	0.027
Passive smoker	17	17	16	16	1.07	0.515-2.247	0.849
Total	100	100	100	100			

* χ^2 -test was used

Obesity and the occurrence of HTN

Regarding obesity table (3.7) reveals that normal BMI had protective effect against HTN (OR=0.17, 95%CI 0.09 - 0.34, P= 0.0001), also shows significant association of over weight and obesity with the

occurrence of HTN (OR=2.00, 95%CI=1.097 - 3.64, OR=2.45, 95%CI= 1.35 - 4.45 respectively) and the difference is statistically significant (P=0.024,0.003) respectively

Table (3.7): Obesity and the occurrence of HTN.

BMI	Cases (n=100)		Controls (n=100)		OR	95% CI For(OR)	P*-Value
	NO	%	NO	%			
< 25	15	15	50	50	0.17	0.09- 0.34	0.0001
25-29.9	40	40	25	25	2.00	1.097-3.64	0.024
≥ 30	45	45	25	25	2.45	1.35- 4.45	0.003
Total	100	100	100	100			

* χ^2 -test was used

Diet and the occurrence of HTN

Table (3.8) shows that 75% of the cases were daily intake of vegetables and fruits compared to 78% of the control group. The table show no association between daily intake of vegetables and fruits and the development of HTN (OR=1.18, 95%CI=0.61- 2.26), the difference found to be statistically not significant (P=0.617).

Table (3.8): Diet and the occurrence of HTN.

Vegetables and fruits intake	Cases (n=100)		Controls (n=100)		OR	95% CI For(OR)	P*-Value
	NO	%	NO	%			
Daily	75	75	78	78	1.18	0.61-2.26	0.617
Not daily	25	25	22	22			
Total	100	100	100	100			

* χ^2 -test was used

History of Diabetes mellitus and the occurrence of HTN.

Table (3.9), demonstrates that there is possible association between the occurrence of HTN and Diabetes

mellitus (OR=1.71, 95%CI=0.749-3.919) but the difference is statistically not significant (P=0.207).

Table(3.9): History of DM and the occurrence of HTN.

History of DM	Cases (n=100)		Controls (n=100)		OR	95% CI For(OR)	P*-Value
	NO	%	NO	%			
Present	16	16	10	10	1.714	0.749-3.919	0.207
Absent	84	84	90	90			
Total	100	100	100	100			

* χ^2 -test was used

History of hypercholesterolemia and the occurrence of HTN

Forty eight among the cases group reported a positive history of hypercholesterolemia, on the other hand 26 controls reported the same factor. Table (3.10) signifies a

significant association between the occurrence of HTN with the hypercholesterolemia (OR=2.62, 95% CI=1.45-4.74) and the difference is statistically significant (P=0.001).

Table(3.10): History of hypercholesterolemia and the occurrence of HTN.

Hypercholesterolemia	Cases (n=100)		Controls (n=100)		OR	95% CI For(OR)	P*-Value
	NO	%	NO	%			
Present	48	48	26	26	2.62	1.45- 4.74	0.001
Absent	52	52	74	74			
Total	100	100	100	100			

* χ^2 -test was used

Sleep duration and the occurrence of HTN.

Table (3.11) demonstrates that there is no association between the occurrence of HTN and sleep duration < 7

hours/day (OR=1.18, 95%CI=0.61-2.29) and the difference is statistically not significant (P=0.611).

Table (3.11): Sleep duration and the occurrence of HTN.

Sleep duration	Cases (n=100)		Controls (n=100)		OR	95% CI For(OR)	P*-Value
	NO	%	NO	%			
> 7 hours/day	24	24	21	21	1.18	0.61- 2.29	0.611
7-9 hours/day	68	68	72	72	0.82	0.45 - 1.15	0.537
< 9 hours/day	8	8	7	7	1.15	0.41- 3.19	0.788
Total	100	100	100	100			

* χ^2 -test was used

CONCLUSIONS

1. The highest frequency of hypertension occurred in the age group ≥ 59 years, HTN affect males more than females.
2. The higher prevalence of HTN is in urban residence, low level of education and illiterate, in retired and none employed, in widow and divorced people.

3. The significant risk factors for HTN were family history of HTN, increase salt intake, physical inactivity, smokers and ex smoker's, hypercholesterolemia, over weight and obesity

Recommendations

1. Care givers have to encourage the population for essential life style changes including adopting regular physical activity, controlling proper body

weight, following a proper dietary regimen and quitting smoking and alcohol.

2. Physicians have to activate their health educational role towards hypertensive patients in clarifying the nature of disease risk factors and its consequences.
3. Further large scale studies are recommended in the future to determine all risk factors of hypertension.

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