AL NAHRAIN UNIVERSITY DEPARTMENT OF MEDICINE

Evaluation of blood pressure control in patient with hypertension

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بسم الله الرحمن الرحيم

♦﴿ وَمَا أَرْسَلْنَا مِنْ قَبْلِكَ إِلَّا رِجَالًا نُوحِي إِلَيْهِمْ فَاسْأَلُوا أَهْلَ الذِّكْرِ إِنْ كُنْتُمْ لَا تَعْلَمُونَ ﴾

صدق الله العظيم

سورة النحل, ألأية 43

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List of abbreviation:

CVD: cardiovascular disease.

ACEIs: angiotensin converting enzyme inhibitors.

ARBs: angiotensin converting enzyme inhibitors.

BB: beta blockers.

CCBs: calcium channel blockers.

PVD: peripheral vascular disease.

DM: diabetes mellitus.

BMI: body mass index

BP: blood pressure

Contents:

ABSTRUCT:

Hypertension is a major global concern and public health problem affecting more than one billion individuals worldwide [1,2] .

Aim of the study:

To assess the rate of blood pressure control among hypertensive patients.

Patient and method:

This is cross sectional study which was done in Imamain_Al Kadhimain medical city in Baghdad from 1st October 2018 to 1st of March 2019. A total of 51 patients Information were gathered from patients using a questionnaire by pressure device with exclude of those patients with secondary hypertension.

Result:

The total51patients were selected randomly, 20 patients were males and 30 patients were females. I.e. females to male's ratio 2:1. The rate of blood pressure control in this study was 32(64%) while only 19(36%) with high blood pressure.

Conclusion: **We recommend better health education and care of patients to improve the rate of blood pressure control at the hospital**

Introduction:

Blood pressure: is created by the force of **blood** pushing against the walls of **blood** vessels (arteries) as it is pumped by the heart Normal adult **blood pressure** is **defined** as a **blood pressure** of120 mm Hg[1] when the heart beats (systolic) and a **blood pressure** of 80 mm Hg when the heart relaxes (diastolic).

Blood pressure measurements fall into four general categories:

- **Normal blood pressure.** Your blood pressure is normal if it's below 120/80 mm Hg.
- **Elevated blood pressure.** Elevated blood pressure is a systolic pressure ranging from 120 to 129 mm Hg and a diastolic pressure below 80 mm Hg. Elevated blood pressure tends to get worse over time unless steps are taken to control blood pressure.
- **Stage 1 hypertension.** Stage 1 hypertension is a systolic pressure ranging from 130 to 139 mm Hg or a diastolic pressure ranging from 80 to 89 mm Hg.
- **Stage 2 hypertension.** More severe hypertension, stage 2 hypertension is a systolic pressure of 140 mm Hg or higher or a diastolic pressure of 90 mm Hg or higher.

And there is important term must be differentiated

White coat hypertension more commonly known as **white coat syndrome**, is a phenomenon in which patients exhibit a blood pressure level above the normal range, in a clinical setting, though they do not exhibit it in other settings.[1] It is believed that the phenomenon is due to anxiety experienced during a clinic visit.[2

The term "**masked hypertension**" can be used to describe the contrasting phenomenon, where a patient's blood pressure is above the normal range during daily living, although it isn't above the normal range when the patient is in a clinic setting.

Hypertension: is one of the most significant risk factors for cardiovascular diseases (CVDs). Being the leading cause of morbidity and mortality among non-communicable diseases.

Hypertension is leading risk factor for CVD and the number one cause of death. The majority of patients' blood pressure remains uncontrolled in all societies.

Currently, low-income and middle-income countries have the highest systolic blood pressure (SBP). Despite the availability of effective medical therapy, more than half of hypertensive patients on treatment have blood pressures above 140/90 mm Hg threshold in developing countries, the high prevalence of hypertension and poor hypertension control are important factors in raising the epidemics of cardiovascular diseases .Behavioral, dietary or genetic factors are responsible for uncontrolled BP.

Uncontrolled hypertension can lead to increased incidence of complications including coronary heart disease, acute myocardial infarction, peripheral vascular disease, stroke, congestive heart failure and renal failure

Recent evidence indicates that hypertension and elevated BP are increasing partly because of the increase in risk factors including smoking, obesity, harmful use of alcohol and lack of exercise (The lack of adequate studies on hypertension significantly affects hypertension management and care hypertensive patients in the country).

Risk factors:

High blood pressure has many risk factors, including:

- **Age.** The risk of high blood pressure increases as you age. Until about age 64, high blood pressure is more common in men. Women are more likely to develop high blood pressure after age 65.
- **Race.** High blood pressure is particularly common among people of African heritage, often developing at an earlier age than it does in

whites. Serious complications, such as stroke, heart attack and kidney failure, also are more common in people of African heritage.

- **Family history.** High blood pressure tends to run in families.
- **Being overweight or obese.** The more you weigh the more blood you need to supply oxygen and nutrients to your tissues. As the volume of blood circulated through your blood vessels increases, so does the pressure on your artery walls.
- **Not being physically active.** People who are inactive tend to have higher heart rates. The higher your heart rate, the harder your heart must work with each contraction and the stronger the force on your arteries. Lack of physical activity also increases the risk of being overweight.
- **Using tobacco.** Not only does smoking or chewing tobacco immediately raise your blood pressure temporarily, but the chemicals in tobacco can damage the lining of your artery walls. This can cause your arteries to narrow and increase your risk of heart disease. Secondhand smoke also can increase your heart disease risk.
- **Too much salt (sodium) in your diet.** Too much sodium in your diet can cause your body to retain fluid, which increases blood pressure.
- **Too little potassium in your diet.** Potassium helps balance the amount of sodium in your cells. If you don't get enough potassium in your diet or retain enough potassium, you may accumulate too much sodium in your blood.
- **Drinking too much alcohol.** Over time, heavy drinking can damage your heart. Having more than one drink a day for women and more than two drinks a day for men may affect your blood pressure.
- **Stress.** High levels of stress can lead to a temporary increase in blood pressure. If you try to relax by eating more, using tobacco or drinking alcohol, you may only increase problems with high blood pressure.
- **Certain chronic conditions.** Certain chronic conditions also may increase your risk of high blood pressure, such as kidney disease, diabetes and sleep apnea.

Sometimes pregnancy contributes to high blood pressure, as well.

Although high blood pressure is most common in adults, children may be at risk, too. For some children, high blood pressure is caused by problems with the kidneys or heart. But for a growing number of kids, poor lifestyle habits, such as an unhealthy diet, obesity and lack of exercise, contribute to high blood pressure.

Complications:

The excessive pressure on your artery walls caused by high blood pressure can damage your blood vessels, as well as organs in your body. The higher your blood pressure and the longer it goes uncontrolled, the greater the damage.

Uncontrolled high blood pressure can lead to complications including:

- **Heart attack or stroke.** High blood pressure can cause hardening and thickening of the arteries (atherosclerosis), which can lead to a heart attack, stroke or other complications.
- **Aneurysm.** Increased blood pressure can cause your blood vessels to weaken and bulge, forming an aneurysm. If an aneurysm ruptures, it can be life-threatening.
- **Heart failure.** To pump blood against the higher pressure in your vessels, the heart has to work harder. This causes the walls of the heart's pumping chamber to thicken (left ventricular hypertrophy). Eventually, the thickened muscle may have a hard time pumping enough blood to meet your body's needs, which can lead to heart failure.
- **Weakened and narrowed blood vessels in your kidneys.** This can prevent these organs from functioning normally.
- **Thickened, narrowed or torn blood vessels in the eyes.** This can result in vision loss.
- **Trouble with memory or understanding.** Uncontrolled high blood pressure may also affect your ability to think, remember and learn.

Trouble with memory or understanding concepts is more common in people with high blood pressure.

- **Dementia.** Narrowed or blocked arteries can limit blood flow to the brain, leading to a certain type of dementia (vascular dementia). A stroke that interrupts blood flow to the brain also can cause vascular dementia.

Treatment:

Changing your lifestyle can go a long way toward controlling high blood pressure. Your doctor may recommend you make lifestyle changes including:

- Eating a heart-healthy diet with less salt
- Getting regular physical activity
- Maintaining a healthy weight or losing weight if you're overweight or obese
- Limiting the amount of alcohol you drink

But sometimes lifestyle changes aren't enough. In addition to diet and exercise, your doctor may recommend medication to lower your blood pressure.

Your blood pressure treatment goal depends on how healthy you are.

Your blood pressure treatment goal should be less than 130/80 mm Hg if:

- You're a healthy adult age 65 or older
- You're a healthy adult younger than age 65 with a 10 percent or higher risk of developing cardiovascular disease in the next 10 years
- You have chronic kidney disease, diabetes or coronary artery disease

Medications to treat high blood pressure

- **Thiazide diuretics.** .

  Thiazide diuretics are often the first, but not the only, choice in high blood pressure medications.

  Angiotensin-converting enzyme (ACE) inhibitors. Angiotensin II receptor blockers (ARBs). .

- **Calcium channel blockers.**

- If you're having trouble reaching your blood pressure goal with combinations of the above medications, your doctor may prescribe:

- **Alpha blockers.**
- **Alpha-beta blockers**
- **Beta blockers.**

  .

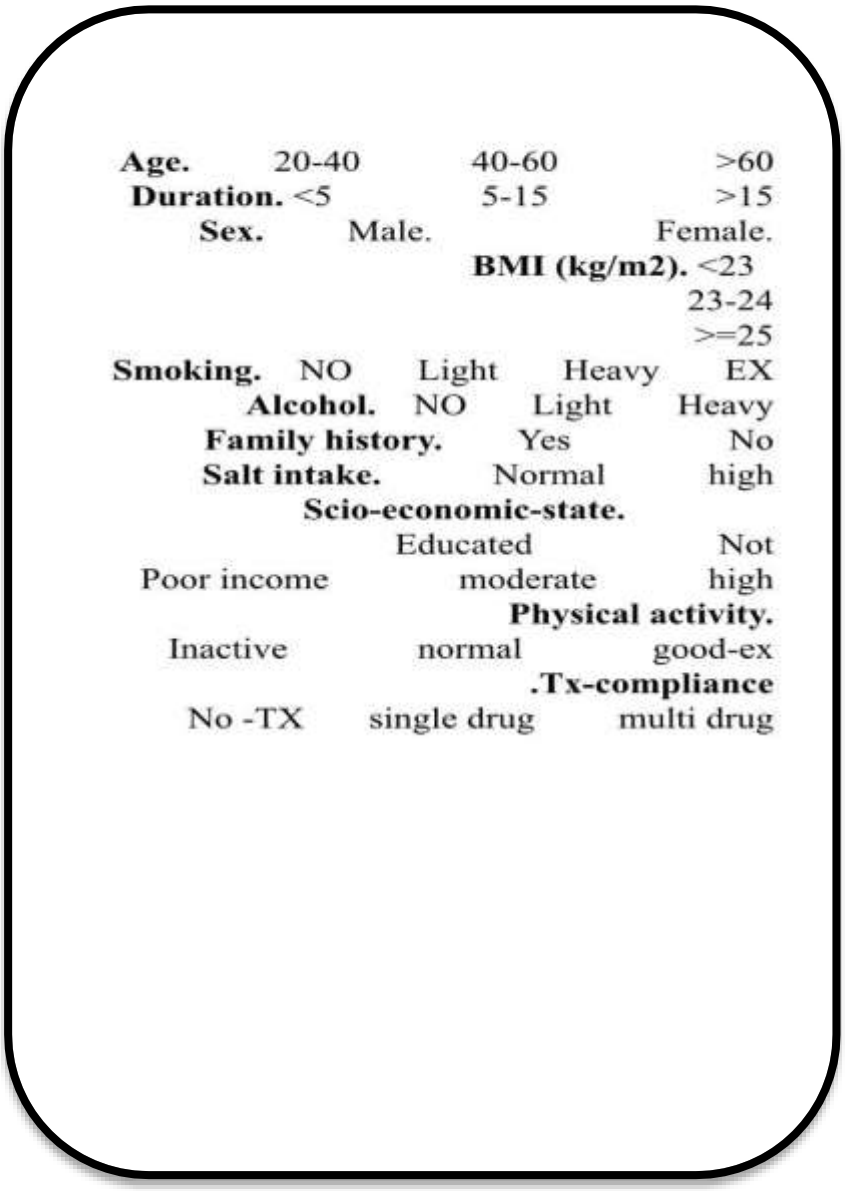
- **Aldosterone antagonists**.
- **Rennin inhibitors.** Aliskiren (Tekturna)
- **VasodilatorsCentral-acting agents.**

Aim of the study:

1. **To assess the rate of blood pressure control among hypertensive patients.**
2. **To identify factors and lifestyle modifications associated with blood pressure control among patients prescribed antihypertensive agents**

Patient and method

This is cross sectional study which was done in Imamain_Al Kadhimain medical city in Baghdad within the period from 1st October 2018 to 1st of March 2019. A total of 51 patients Information on socio-demographic characteristics of the participants, co morbidities, antihypertensive medication, and adherence to antihypertensive medication and BMI by measuring the weight and height of the patients were gathered from patients using a questionnaire. And blood pressure measurements were collected retrospectively from medical records and by pressure device with exclude of: patients with secondary hypertension (not a been, those take drug that increase blood pressure, renal failure, age <18) of the results were done using Microsoft Excel 2010 Information obtained from them included:



The result:

The total 51patients were selected randomly from Al Kadhimain hospital floor. As shown in table (1) 20 patients were males and 30 patients were females.

I.e. Females to male's ratio 2:1. AS shown in table (2) the mean age of the participants was 24(48%) (Range from 40-60 and >60 years).

As shown in table (6) The majority 38(75%) of the participants have been taking salt with food was related to poor blood pressure in addition to increase BMI and no for increase physical inactivity.

As shown in table (9) 23(46%)of the participants were physically inactive was related also to less effective blood pressure to those with no salt intake and good physical activity.

As shown in table (8) Five participants (10%) were heavy and also same number for ex- cigarette smokers. As shown in table (7), 51 (100%) were no alcohol drinkers and there's 0.00% alcohol drinkers in this sample.

As shown in table (5). The majority 37 (74%) of the participants were overweight .

As shown in table (4). The mean duration of hypertension was 5 years 29(58%).

Regard antihypertensive medications as shown in table (10) 7(14%) were on multi medications and 33(66%) were on mono-therapy and 10(20%) with on antihypertensive medication the number of antihypertensive medications prescribed was not associated with blood pressure control status.

As shown in table (11) The rate of blood pressure control in this study was 32(64%) while only 19(36%) with high blood pressure.

Socio-demographic characteristics of hypertensive patients

Table (1) sample according to gender

gender	number	%
male	20	40%
female	30	60%

Table (2) age distribution in the sample

Age group	Number (%)
20-40	2(4%)
40-60	24(48%)
>60	24(48%)

Table (11) blood pressure measure in the sample

blood pressure measure	Number (%)
Normal blood pressure	32(64%)
High blood pressure	19(36+%)

Table (3) Scio-economic-state in the sample

Education level	Number (%)
Educated	1(2%)
Not educated	49(98%)
Poor income	6(12.92%)
Moderate income	45(87.22%)
High income	0(0.00%)

Table (4) duration of hypertension in the sample

duration	Number (%)
<5	29(58%)
5-15	19(38%)
>15	2(4%)

Table (5) body mass index in the sample

BMI	Number (%)
<25	3(6%)
25_29	37(74%)
>30	10(20%)

Life style factors of hypertensive patients

Table (6) salt intake in the sample

Salt intake	Number (%)
Normal	13(25%)
high	38(75%)

Table (7) alcohol intake in the sample

Alcohol intake	Number (%)
No	51(100%)
light	0(0.00%)
heavy	0(0.00%)

Table (8) cigarettes smoking in the sample

Cigarettes smoking	Number (%)
no	35(69%)
light	6(11%)
heavy	5(10%)
Ex_smoker	5(10%)

Table (9) physical activity in the sample

Physical activity	Number (%)
inactive	23(46%)
normal	26(52%)
Good -exercise	1 (2%)

Table (10) treatment compliance in the sample

Treatment compliance	Number (%)
No treatment	10(20%)
Single drug	33(66%)
Multi drug	7(14%)

Discussion:

This is cross sectional study which was done in Imamain-Al Kadhimain medical city in Baghdad to assess the rate of blood pressure control among hypertensive patients.

The result of the current study showed that only one third of hypertensive patients on pharmacologic treatment had a controlled BP 32(64%) The level of BP control found in this study was similar to the study conducted in Nigeria (30.5 %) [20]. the present study revealed similar result with the health center based study (31%) [29]. this similarity might be due to the study conducted in the same geographic area and similar inclusion criteria. But the level of BP control found in this study was lower than the studies from Saudi Arabia (72%) [30]. this difference in the level of BP control might be due to a more aggressive therapy with two or more drug combinations. The racial difference might have contributed to this inconsistency. Moreover, the level of BP control in the present study a little bit higher than the study performed two years ago (26.2%) by Adugna, this difference might be due to the use of different guidelines as a standard. But the level of BP control in the present study was higher than the study performed (15%) by Abera et al. [33].This difference might be due to patients with co morbid conditions difficult to achieve target BP easily and in case of the study conducted by Abera et al. all hypertension patients had DM.

Some of the reasons attributed to the inadequate BP control were reported to be poor compliance with medications which is strongly determined by poverty, excessive salt intake, use of non-steroidal anti-inflammatory drugs (NSAIDs) and inappropriate combinations with inadequate dosing of antihypertensive agents was revealed by Etuk et al. [20].

the status of patients' compliance to prescription and patients' lifestyle change were significantly affected the outcome of medication in which that 45(87.22%)had moderate income and 49(98%)not educated.

The prevalence of appropriate use of antihypertensive medications found in this study 80% was higher than the studies from Saudi Arabia (60%) [30], lower than Ethiopia (97.0%) .

The results of the present study indicated that the proportion of females with hypertension 30(60%) was high. this is due to better compliance and adherence among the women survey This study was in line with two Ethiopian studies [1,36] and Nigeria study [16]. In contrary, the present

study was inconsistence with other studies which were conducted in Bangladesh [37] and India [38].

The result showed that age was significantly associated with inappropriate prescription pattern of antihypertensive medications in patient's age ≥ 60 years

This study also revealed that 24(48%) of hypertension patients were age over (40-60) years, was in line with the study in Ethiopia [1] and India [39]. These results showed that age may affect the incidence of hypertension. In the present study the majority of the patients were 40-60 and >60 similar to the study conducted in China with the mean age was 61.3 ± 13.7 years.

A variety of dietary modifications are known to be beneficial in the treatment of hypertension, including reduction of sodium intake; moderation of alcohol intake which is estimated 100% nonalcoholic in our study weight loss in overweight or obese individuals; and a diet rich in fruits, vegetables, legumes, and low-fat dairy products, and also low in snacks, sweets, meat, and saturated fat. Individual dietary factors may also be helpful in lowering blood pressure.48)

in our study sodium intake 38(75%) lower than sodium intake among Koreans was estimated to be 45% to 65%, which tends to be higher than in Western countries so decreased salt intake was positively associated with successful blood pressure control.

In our study weight loss in overweight 37(74%) or obese individuals >30, 10(20%) lower than body mass index 25-29 (173(60%) and >30 (29(10%) in Southwest Ethiopia.

In our study the number of no smoker patient 35(69%), heavy and ex-smoker 5(10%) lower than study in Southwest Ethiopia 268(93%)heavy and ex-smoker 9(3.1%).

The result of the study showed that majority of the patients were on combination therapy 7(14%) which was lower than the study conducted in Nigeria, 2008 (80%) [20] In Togo, 2012 (81.40%) [32] And the study conducted in Ethiopia by Adugna, (83.1%) [41]. in Ethiopia (34.5%) [1], Bangladesh (38.4%) [37] and China (37.1%) [8]. the prescription rate of combination therapy might be due to the longer duration of hypertension therapy and being high risk patients. Moreover, according to the study the majority of the patients were on mono-therapy 33(66%) [29]. The present

study was inconsistent with the above study might be due to the hospital based patients presented with severe and more complicated hypertension

According to the Ethiopian guideline 2014, mono-therapy was only preferred if the target blood pressure was achieved successfully by that particular antihypertensive agent. But if the target blood pressure was not achieved with one agent, then poly-therapy should be introduced and low doses of two or more agents should be given. Nature of therapy was also found to have association with inappropriate prescription pattern of antihypertensive medications in that when compared with mono-therapy.

Conclusion and recommendation

Which is based on evidence from randomized controlled trials, suggest that a healthy eating, weight management, and appropriate physical activity are essential for the management of high blood pressure in adults, since these lifestyle managements have the potential to improve blood pressure control and even reduce the need for medication. Our findings indicate that to achieve better rates of blood pressure control, the clinician should advise lifestyle modifications such as adequate physical activity and low salt intake, in addition to prescribing medication and monitoring the patient for hypertension control.

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