PREVALENCE OF HYPERTENSION AND ITS COMPLICATIONS IN EMERGENCY ROOM CHRISTIAN UNIVERSITY OF INDONESIA HOSPITAL IN 2017

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Abstract

Background: Hypertension continues to be a problem in public health for both developing and developed countries due to its complications which increase the mortality rate. According to Riskesdas 2013, the national prevalence of hypertension rate for people aged ≥18 is 25,8%. In Jakarta itself, the rate reached until 20%.

Objective: To find the prevalence, general characteristics, risk factors and complications related to hypertension in emergency room Christian University of Indonesia Hospital in 2017.

Method: Cross-sectional method is applied to analyze data from medical record on January - December 2017 by using consecutive sampling. The variables are general characteristics (age, gender, hypertension level), risk factors (smoking history, diabetes mellitus, dyslipidemia, obesity), and complications (cerebrovascular disease, heart disease, kidney disease). The criteria for hypertension diagnosis are according to JNC VIII, 2013.

Result: There are 416 people had hypertension history with average age 61. Among those, 53,4% people were females and males are 46,6%. The most common hypertension level is stage 2 36,3%, stage 1 is 32%, hypertensive emergencies 14,9%, controlled hypertension 8,9%, hypertensive urgency 7,9%. The risk factors found are smoking history 56%, diabetes mellitus 45,4%, dyslipidemia 51,9% and body mass index were overweight 54,8%. The complications such as cerebrovascular disease are found 21,6%, heart disease 40,9% and kidney disease 33,2%.

Conclusion: Hypertension are commonly found in adult and females. Smoking history, overweight and dyslipidemia still the leading role risk factors for hypertension disease, and the most target organ damage was found related to hypertension are heart disease.

CHAPTER 1 PRELIMINARY

1.1 Background

Hypertension or an increase in blood pressure is a chronic disease and has always been a problem in public health in general, both in developed and developing countries.

Hypertension is also known as the "silent killer" which is often asymptomatic, but can damage several important organs such as the heart, brain, and kidneys.[1] Based on the organs that are the target of damage from hypertension, uncontrolled hypertension can increase the risk of developing it. Dead. Statistics show that hypertensive complications cause an estimated 9.4 million deaths worldwide each year.[2]

Based on data from Riskesdas in 2013, the prevalence of hypertension at age ≥18 years in Indonesia.as much as 25.8%. In DKI Jakarta alone, the prevalence of hypertension based on a diagnosis of health personnel obtained through measuring blood pressure reaches 20%[3]

Several things that have been found in patients in general, such as a history of cigarette consumption, diabetes, dyslipidemia and obesity have been identified as risk factors for increased blood pressure.

Complications from hypertension are quite serious problems around the world. In addition to increasing the mortality rate, complications of hypertension also increase the cost of care for sufferers.

This makes it important to do prevention & proper management in dealing with hypertension sufferers so that they can reduce the risk of complications

1.2 Problem Formulation

Based on the background of the problem above, the problem formulation of this study is what is the prevalence of hypertension sufferers and its complications in the Emergency Unit of the General Hospital of the Christian University of Indonesia in 2017.

1.3 Research Objectives

1. General Purpose

To find out the prevalence of hypertension and its complications in the Emergency Unit at the General Hospital of the Christian University of Indonesia in 2017.

2. Special Purpose

a. To find out the general characteristics of hypertensive patients such as age, gender and hypertension level in the UGD at UKI Hospital.
b. To determine the risk factors in hypertensive sufferers such as a history of smoking, dyslipidemia, diabetes and obesity in the UGD RSU UKI.
c. This is to determine the prevalence of complications in hypertensive patients such as history stroke, history of heart disease and history of kidney disorders in the UGD RSU UKI.

1.4 Benefits

1. For the author

The results of this study can be used as additional information and knowledge about hypertension and the authors note the importance of proper prevention and management of hypertensive patients with the aim of preventing complications.

2. For Health Services

The results of this study can be used by all health service personnel to realize the importance of prevention, early diagnosis and proper management of hypertensive patients with the aim of preventing complications.

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3. For Education

The results of this study can be used as reference data for further research related to prevalence, general characteristics, risk factors and complications of hypertension

CHAPTER II   LITERATURE REVIEW

1.1 Definitions

Hypertension is a persistent increase in vascular pressure characterized by systolic pressure ≥140 mmHg and / or diastolic pressure ≥90 mmHg on two measurements with an interval of 5 minutes while in a well-rested state.

1.2 Etiology

Based on the cause, about 90% of hypertension sufferers are classified as primary or essential hypertension, namely when the cause of hypertension cannot be identified (idiopathic) .[1]

Meanwhile the other 5-10% are classified as secondary hypertension, which is caused by an underlying disease such as kidney problems, drug use or hormonal disorders. [1]

1.3 Classification

The classification of hypertension based on JNC VII 2003 can be seen in the following table:

Table 1. Classification of hypertension [4]

Classification	Systolic blood pressure (mmHg)	Diastolic blood pressure (mmHg)
Normal	< 120	dan < 80
Pre-hypertension	120 – 139	atau 80-89
Hypertension level 1	140 –159	atau 90- 99
Hypertension level 2	≥ 160	atau ≥ 100

1.Crisis Hypeertension [4]

a. Emergency Hypertension Sudden increase in systolic blood pressure> 180 mmHg or diastoic> 120 mmHg with target organ damage.
b. Urgent Hypertension Raised blood pressure as in emergent hypertension but without target organ damage.

1.4 Risk factors

Risk factors can be used as two factors that can and cannot be controlled.

A factor that cannot be controlled

- **Age**

   Increased blood pressure can occur with age, caused by changes in the structure of large blood vessels, so that the lumen becomes narrower and the walls of the blood vessels become stiffer. The function of the kidneys in regulating blood pressure is also disrupted due to glomerulosclerosis and interstitial fibrosis. .[5]

- **Gender**

   In the premenopausal period, the prevalence of hypertension in women is lower than that of men, but with age the prevalence of women will increase due to the activity of female hormones. Estrogen and progesterone play an important role in preventing damage to blood vessels. Estrogen itself can also increase the sensitivity of the relationship between pressure and natriuresis and increase sodium excretion. .[6,7]

- **Family History**

   A close family history of hypertension will increase the

risk of hypertension, especially in primary hypertension. .[1]

2. Controllable factors

• Smoking habit

Smoking is also associated with hypertension. Toxic chemicals, such as nicotine and carbon monoxide that are inhaled through cigarettes, which enter the bloodstream can damage the endothelial lining of arteries and lead to atherosclerosis and hypertension. Besides smoking also increases heart rate which affects blood pressure. .[8]

• Consume Salt

Salt is a very important factor in the pathogenesis of hypertension. Salt causes fluid retention in the body, which increases blood volume and pressure. The recommended salt consumption is not more than 6 grams / day. .[1]

• Drinking Consumption Habits

Alcoholic beverages

The mechanism of alcohol-induced increase in blood pressure is unclear. However, it is suspected that an increase in cortisol levels, an increase in the activity of the autonomic nerves, plays a role in increasing blood pressure .[9]

• Psychosocial and stress

Stress or mental tension can be sympathetic nerves

which will trigger the release of catecholamines, thereby increasing heart rate and cardiac output thereby increasing blood pressure. If this situation continues, the body will try to make adjustments so that organic abnormalities or pathological changes occur. [10]

• Hiperlipidemia / hypercholesterolemia

Fat (lipid) metabolism disorders are characterized by increased levels of total cholesterol, triglycerides, LDL cholesterol and or decreased blood HDL cholesterol. Cholesterol is an important factor in the resulting atherosclerosis. [11]

1.4 Pathophysiology

Increased peripheral resistance thereby increasing blood pressure. [11] Dyslipidemia, a strong predictor of CVD, may also predict an incident hypertension. We analyzed 3110 men free of hypertension, CVD, and cancer from the Physicians' Health Study, who provided baseline blood samples from which we measured total cholesterol (TC).

• Obesity

Overweight (obesity) is the percentage of fat abnormalities expressed in the body mass index (body mass index). This may be due to increased renal sodium retention, and increased sympathetic nerve activity due to leptin and hyperinsulinemia in obese people. [12]
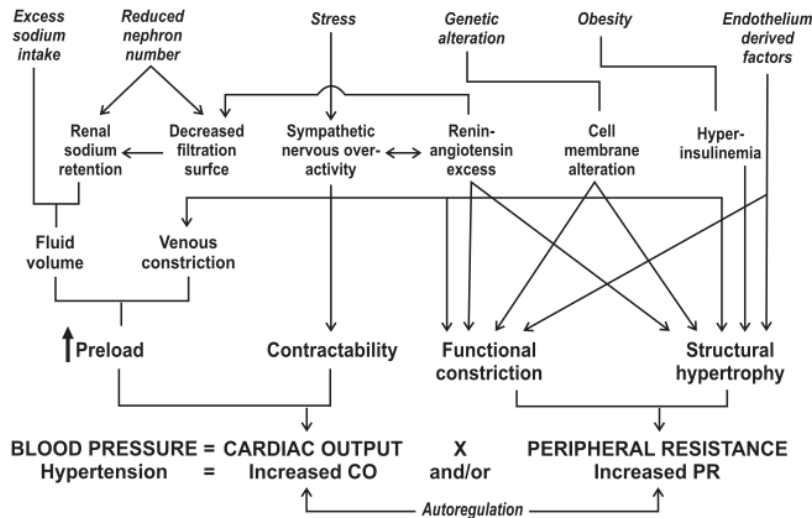
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Figure 1. Pathophysiology of hypertension

The pressure required to flow blood through the circulatory system is exerted by the pumping action of the heart (cardiac output / CO) and peripheral vascular resistance. The work function of each of these blood pressure determinants is influenced by the interaction of various complex factors. Hypertension is actually an abnormality of these factors, characterized by increased cardiac output and / or peripheral resistance. [13]

Cardiac output is associated with hypertension, the increase in cardiac output logically arises from two pathways, namely either through increased fluid (preload) or increased contractility.

of the sympathetic nerve stimulating effect. But the body can compensate so that cardiac output does not increase, namely by increasing peripheral resistance. [13]

In addition, excess sodium consumption can cause hypertension due to increased fluid volume in blood vessels and preload, thereby increasing cardiac output. [13]

1.5 Management

1. Pharmacological Management

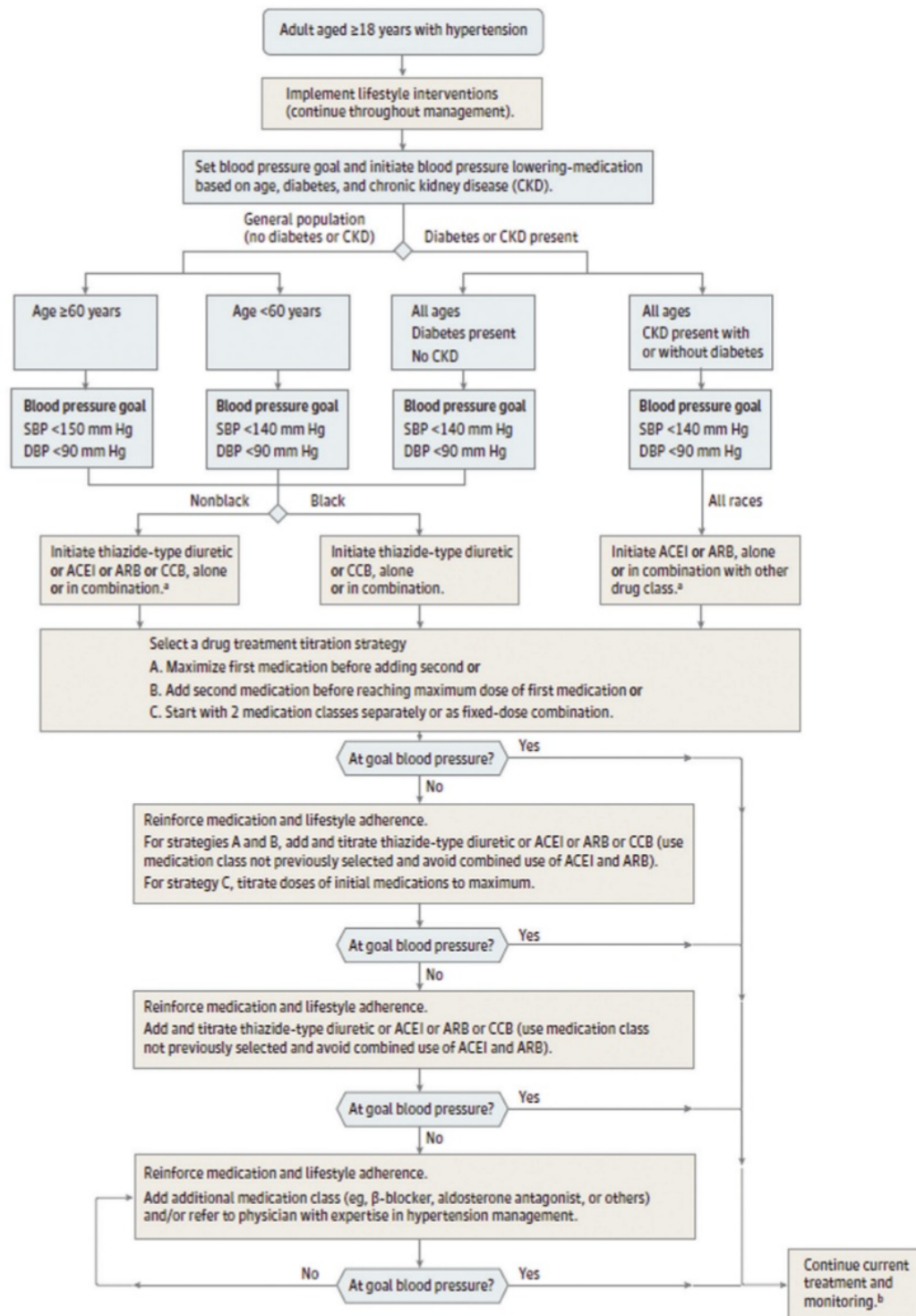There are several recommendations according to JNC VIII for treating hypertension according to the following algorithm [14]

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Adult aged ≥18 years with hypertension

Implement lifestyle interventions (continue throughout management).

Set blood pressure goal and initiate blood pressure lowering-medication based on age, diabetes, and chronic kidney disease (CKD).

General population (no diabetes or CKD) — **Diabetes or CKD present**

Age ≥60 years

Age <60 years

All ages Diabetes present No CKD

All ages CKD present with or without diabetes

Blood pressure goal SBP <150 mm Hg DBP <90 mm Hg

Blood pressure goal SBP <140 mm Hg DBP <90 mm Hg

Blood pressure goal SBP <140 mm Hg DBP <90 mm Hg

Blood pressure goal SBP <140 mm Hg DBP <90 mm Hg

Nonblack — **Black** — **All races**

Initiate thiazide-type diuretic or ACEI or ARB or CCB, alone or in combination.[a]

Initiate thiazide-type diuretic or CCB, alone or in combination.

Initiate ACEI or ARB, alone or in combination with other drug class.[a]

Select a drug treatment titration strategy
A. Maximize first medication before adding second **or**
B. Add second medication before reaching maximum dose of first medication **or**
C. Start with 2 medication classes separately or as fixed-dose combination.

At goal blood pressure? — Yes

No

Reinforce medication and lifestyle adherence.
For strategies A and B, add and titrate thiazide-type diuretic or ACEI or ARB or CCB (use medication class not previously selected and avoid combined use of ACEI and ARB).
For strategy C, titrate doses of initial medications to maximum.

At goal blood pressure? — Yes

No

Reinforce medication and lifestyle adherence.
Add and titrate thiazide-type diuretic or ACEI or ARB or CCB (use medication class not previously selected and avoid combined use of ACEI and ARB).

At goal blood pressure? — Yes

No

Reinforce medication and lifestyle adherence.
Add additional medication class (eg, β-blocker, aldosterone antagonist, or others) and/or refer to physician with expertise in hypertension management.

No — **At goal blood pressure?** — Yes

Continue current treatment and monitoring.[b]

Figure 2. The algorithm for managing hypertension in adults [14]

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Some recommendations on the JNC VIII for therapeutic targets: [14]

- Recommendation 1: In the general population, pharmacologic therapy should be started if the systolic blood pressure is ≥150 mmHg or if the diastolic blood pressure is ≥90 mmHg in the age group. ≥60 years with targeted therapy is the systolic blood pressure <150 mmHg and blood pressure diastolic <90 mmHg.

- Recommendation 2: In the age group <60 years, start pharmacologic therapy if the blood pressure is diastolic ≥90 mmHg with targeted therapy is the diastolic blood pressure <90 mmHg (for the 30-59 year age group).

- Recommendation 3: In the age group <60 years, pharmacologic therapy is started if the systolic blood pressure is ≥140 mmHg with the target of therapy is systolic blood pressure. <140 mmHg.

- Recommendation 4: In the age group ≥18 years with chronic renal failure, pharmacological therapy should be started if systolic blood pressure is ≥140 mmHg or diastolic blood pressure ≥90 mmHg with the target of therapy is systolic blood pressure. <140 mmHg and blood pressure diastolic <90 mmHg.

- Recommendation 5: In the age group ≥18 years with diabetes mellitus, pharmacologic therapy start given if systolic blood pressure ≥140 mmHg or diastolic blood pressure ≥90 mmHg with the target of therapy is systolic blood pressure <140 mmHg and blood pressure diastolic <90 mmHg.

- Recommendation 6: In the nonblack population, including those with diabetes mellitus, initial therapy may include diuretics-thiazides, calcium channel blockers, angiotensin-converting enzyme inhibitors (ACEIs) or angiotensin receptor blockers (ARBs).

- Recommendation 7: In the black population, including those with diabetes mellitus initial therapy can use diuretics- thiazides or calcium channel blockers.

- Recommendation 8: In the age group ≥18 years with chronic renal failure, antihypertensive therapy should use ACEIs or ARBs to improve kidney output. (This therapy applies to all chronic kidney failure patients with hypertension regardless of race or diabetes mellitus or not.).

- Recommendation 9: The main objective of managing hypertension is to achieve and maintain a targeted blood pressure. If the target blood pressure is not reached after 1 month of treatment, the dose of the drug must be increased or added with other drugs from the same class (diuretic-thiazide, CCB, ACEI, or ARB). If the target blood pressure still cannot be reached after using 2 kinds of drugs then a third drug can be added (not allowed to use a combination of ACEI and ARB together). If the target blood pressure has not been reached after using the drug derived from recommendation 6 because there is a contraindication or need > 3 types of drugs to reach the target blood pressure, then antihypertensive therapy from other groups can be used.

For pharmacological therapy, here are some types of drugs and their dosages that can be used.

Figure 3. Anti-hypertensive drugs and their dosage [14]

Antihypertensive Medication	Initial Daily Dose, mg	Target Dose in RCTs Reviewed, mg	No. of Doses per Day
ACE inhibitors			
Captopril	50	150-200	2
Enalapril	5	20	1-2
Lisinopril	10	40	1
Angiotensin receptor blockers			
Eprosartan	400	600-800	1-2
Candesartan	4	12-32	1
Losartan	50	100	1-2
Valsartan	40-80	160-320	1
Irbesartan	75	300	1
β-Blockers			
Atenolol	25-50	100	1
Metoprolol	50	100-200	1-2
Calcium channel blockers			
Amlodipine	2.5	10	1
Diltiazem extended release	120-180	360	1
Nitrendipine	10	20	1-2
Thiazide-type diuretics			
Bendroflumethiazide	5	10	1
Chlorthalidone	12.5	12.5-25	1
Hydrochlorothiazide	12.5-25	25-100ᵃ	1-2
Indapamide	1.25	1.25-2.5	1

1. Non Pharmacological Management

The non-pharmacological approach is the initial treatment before adding hypertension drugs, in addition to the need to be considered by someone who is currently in drug therapy. Meanwhile, patients with controlled hypertension, this non-pharmacological approach can help reduce drug doses in some patients. Therefore, lifestyle modification is important because it plays a role in the successful management of hypertension. Lifestyle modifications can be done by limiting salt intake to no more than 1/4 - 1/2 teaspoon (6 grams / day), losing weight, avoiding caffeinated drinks, cigarettes and alcoholic drinks. Exercise too.

It is recommended for people with hypertension, which can be in the form of walking, running, jogging, cycling for 20-25 minutes with a frequency of 3-5 times per week. It is also important to get enough rest (6-8 hours) and control stress. [1]

1.6 Complications

1. Heart

Heart disease is the most common cause of death in hypertensive patients. Hypertensive heart disease is the result of changes in structure and function that lead to enlarged left heart, diastolic dysfunction, and heart failure. [14]

2. Brain

Hypertension is an important risk factor for cerebral infarction and hemorrhage. About 85% of strokes are due to infarction and the rest due to hemorrhagic. The

incidence of stroke increases progressively with increasing blood pressure, especially at age> 65 year. Treatment of hypertension reduces the incidence of either ischemic stroke or hemorgic stroke. [15]

3. Kidneys

Chronic hypertension causes nephrosclerosis, a common cause of renal insufficiency resulting in renal failure. [15]

CHAPTER III : RESEARCH METHODS

1.1 Type of Research

The research design used was descriptive method with cross sectional approach.

1.2 Location and Time of Research

The research was conducted in the medical records of the UKI Hospital from September 2017 to January 2018

1.3 Population and Sample

The population and sample in this study were all patients with a history of hypertension who came to the UGD at RSU UKI in 2017

1.4 Data Collection Methods

The data were obtained from the medical records of UKI Hospital with consecutive sampling technique

1. Operational Definition

1. Hypertension or increased blood pressure is usedin accordance with the JNC VIII criteriain 2013
2. Controlled hypertension is a patient with a history of hypertension who at the time of coming to the UGD at UKI Hospital was in the blood pressure according to the target based on JNC VIII in 2013

3. Age is the length of time the patient lives until he comes to the UGD at RSU UKI which is stated in years. If there is an excess of more than 6 months, it will be rounded up if there are 6 months or less it will be rounded down.
4. Gender is the gender of the patient, namely male or female.
5. Body weight is the weight of the patient when he comes to the UGD at RSU UKI which is expressed in kilograms.
6. Height is the height of the patient when he comes to the ER at UKI Hospital which is expressed in centimeters
7. Body Mass Index is a calculation based on height and The patient's body weight is ultimately used to detect the degree of the patient's body whether it is underweight, ideal body weight, obese or obese.

CHAPTER IV RESULTS AND DISCUSSION

1.1 General Characteristics

After conducting research through medical record data at the UKI Hospital, 416 patients with a history of hypertension came to the ER at UKI Hospital during 2017. Of the total patients, 194 male patients (46.6%), while 222 women (53 , 4%). In this study, the prevalence of hypertension was found to be more common in women, according to the national prevalence that women suffer from hypertension more than men[3.] This is also in accordance with the research from NHANES, that women during premenopause have a lower risk and incidence than men of the same age, but as they get older women will have a higher percentage of hypertension than men[16]. Several factors have been

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studied that the role of the hormones estrogen and progesterone can help prevent damage to blood vessels due to oxidative stress and inflammation, and has an effect on the smooth muscle contraction of blood vessels. Estrogen itself can also increase the sensitivity of the pressure relationship and natriuresis and increase sodium excretion [6,7]

Table 2.Distribution of hypertensive patients in the ER at UKI Hospital in 2017 based on gender (N = 416)

Gender	Amount (n)	Percentage (%)
Men	194	46,6
Woman	222	53,4
Amount	416	100

The results showed that the highest prevalence of hypertension occurred in adults (18-64 years) with a total of 279 patients (67%), while in the elderly 137 patients (33%). Based on the diagram, there is a significant increase in the frequency of hypertensive patients starting from the age of 43 who reach a peak at the age of 56-66 years so that the total average age is 61. This result is also in accordance with the study conducted by Riskesdas in 2013 that the prevalence of hypertension will increase with age. [3] This is likely due to stiffer blood vessels, the occurrence of glomerulosclerosis and interstitial fibrosis of the kidney which will result in impaired kidney function in regulating blood pressure, and reduced sensitivity of baroreceptors .[5]

Table 3 Distribution of hypertensive patients in the ER at UKI Hospital in 2017 based on age classification (N = 416)

AGE TOTAL (n) PERCENTAGE (%)

Age	Amount(N)	Percentage (%)
Adult (18-64)	279	67
Lansia (≥65)	137	33
Amount	416	100

Figure 4. Distribution of hypertensive patients in the ER at UKI Hospital in 2017 by age (N = 416)

AGE
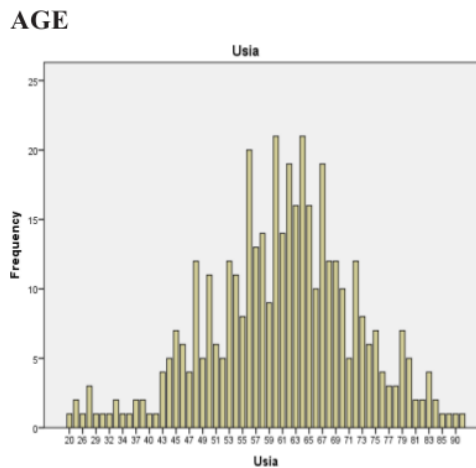
Based on the classification of the degree of hypertension, 151 patients (36.3%) had hypertensiongrade 2, hypertension grade 1 as many as 133 patients (32%), thenhypertension emergency as much 62 patients (14.9%), controlled hypertension as many as 37 patients (8.9%) and urgency hypertension as many as 33 patients (7.9%).

Table 4. Distribution of hypertensive patients in the ER at UKI Hospital in 2017 based on the classification of hypertension degree (N = 416)

Degree Of Hypertension	Amount (N)	Percentage (%)
Controlled Hypertension	37	8,9
Hypertension Level 1	133	32
Hypertension Level 2	151	36,3
Hypertension Urgensi	33	7,9
Hypertension Emergency	62	14,9
Amount	416	100

1.2 Risk Factors

Based on the risk factors for hypertension which included a history of smoking, diabetes mellitus, dyslipidemia and obesity, 233 people (56%) had a history of smoking and 183 (44%) had no smoking history. This is in accordance with the research conducted by Aurelio, et al, which states that acute and chronic exposure to carbon monoxide and nicotine from cigarettes can affect the increase in blood pressure[17]

Meanwhile, according to research conducted by Pradhan, smoking history itself is not associated with hypertension, but if there are other risk factors, the results will be related. [18] Several studies have shown different things about the relationship between smoking and hypertension. So the authors conclude that it is not clear whether smoking causes hypertension, but smoking can be a risk factor for hypertension.

Table 5. Distribution of hypertensive patients in the ER at UKI Hospital in 2017 with a history of smoking (N = 416)

Smoking	Amount(N)	Percentage (%)
Positif	233	56
Negatif	183	44
Amount	416	100

History of diabetes mellitus was obtained in 180 people (45.4%) and 227 people (54.6%) who did not have diabetes mellitus. The results of this study contrary to the study of Venugopal et al., which stated that the prevalence of hypertension would increase in patients with diabetes mellitus caused by diabetes mellitus.increased insulin resistance. Increased insulin resistance will cause hyperinsulinemia, resulting in increased sodium retention in the kidneys and / or increased sympathetic nerve activity . [19] This may be due to some respondents who did not have a complete laboratory examination so that patients without a history of diabetes mellitus were not detected.

Table 6.Distribution of hypertensive patients in the ER at UKI Hospital in 2017 accompanied by diabetes mellitus (N = 416)

Diabetes Melitus	Amount (N)	Percentage (%)
Positif	180	45,4
Negatif	227	54,6
Amount	416	100

History of dyslipidemia 216 patients (51.9%), and 200 other people (48.1%) did not suffer from dyslipidemia. A history of dyslipidemia was found at 216 patients (51.9%). The results in this study are in

accordance with the research of Ruben et al, which shows a significant relationship of an increase in lipid levels to an increase blood pressure. [11] Dyslipidemia, astrong predictor of CVD, may also predict incident hypertension. We analyzed 3110 men free of hypertension, CVD, and cancer from the Physicians' Health Study, who provided baseline blood samples from which we measured total cholesterol (TC).

Table 7.Distribution of hypertensive patients in the ER at UKI Hospital in 2017 accompanied by dyslipidemia (N = 416)

Dislipidemia	Amount (N)	Percentage (%)
Positif	216	51,9
Negatif	200	48,1
Amount	416	100

Based on the calculation of body mass index, there were 228 patients (54.8%) in the criteria for overweight, 178 patients (42.8%) had normal weight, 7 the patient (1.7%) was obese class 1 and 3 patients (0.7%) underweight. This result is also consistent with the research conducted by Hasanet al, that overweight or obesity will increase the risk of developing hypertension in. [20] This is likely due to increased sodium retention in the kidneys, and increased sympathetic nerve activity caused by leptin and hyperinsulinemia. .[12]

Table 8. Distribution of hypertensive patients in the ER at UKI Hospital in 2017 based on the classification of body mass index (N = 416)

Body Mass Index	Amount (N)	Precentage (%)
Under weight (<18,5)	3	0,7
Normal weight (≥18,5 - <25)	178	42,8
Under weght (≥25 - <30)	228	54,8
Obese cls 1 (≥30 - <35)	7	1,7
Amount	416	100

Based on complications from hypertension that can cause damage to target organs, cerebrovascular disease was found in 90 people (21.6%), heart disease as many as 170 people (40.9%) and kidney disease as many as 136 people (32.7%). These results are not an accumulation in the number of patients due to complications in hypertension can cause damage to more than one organ.Based on national prevalence, the incidence rate of coronary heart disease obtained from interviews is 1.5%. Then, the prevalence of chronic kidney failure is 0.2% and the prevalence of stroke is 12.1% ..[1]

Table 9. Distribution of hypertensive patients in the ER at UKI Hospital in 2017 who suffered from cerebrovascular disease (N = 416)

Cerebrovascular Disesase	Amount (N)	Precentage (%)
Positif	90	21,6
Negatif	326	78,4
Jumlah	416	100

Table 10. Distribution of hypertensive patients in the ER at UKI Hospital in 2017 who suffer from heart disease (N = 416)

Heart Disease	Amount	Precentagee (%)
Positif	170	40,9
Negatif	246	59,1
Jumlah	416	100

Table 11. Distribution of hypertensive patients in the ER at UKI Hospital in 2017 who suffer from kidney disease (N = 416)

Kidney Disease	Amount (N)	Precentage (%)
Positif	136	32,7
Negatif	280	67,3
Jumlah	416	100

BABV : KESIMPULAN DAN SARAN

Hypertension and its complications are still one of the main causes of patients coming to the emergency room at the hospital, causing increased morbidity and mortality. Generally in this study, hypertensive patients were found in adulthood with female gender. The risk factors identified included a history of smoking, dyslipidemia and being overweight. For complications that occur based on target organ damage from hypertension, heart disease is commonly found.

This research is expected to be material for consideration and input to improve quality as well quality of health services, especially in reducing the incidence of hypertension through preventive action. The need for early detection and public awareness of hypertension is also important in preventing complications from hypertension.

In this study there are still many shortcomings and limitations. Therefore, it is necessary to carry out further research, especially on the risk factors for hypertension related to proper prevention in hypertension control programs in the community.

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