

ACHIEVEMENT OF BLOOD PRESSURE TARGET WITH MEDICATION ADHERENCE AND SODIUM CONSUMPTION IN SAIFUL ANWAR GENERAL HOSPITAL OUTPATIENT CLINIC

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INTRODUCTION

Hypertension is a common clinical problem that responsible of deaths account for 9.4 million people in worldwide every year.¹ The worldwide prevalence of hypertension estimated increase from 26.4% in 2000 to 29.2% in 2025.² An estimated 65 million adult Americans, or nearly one fourth of the adult population of the United States, have hypertension. Another quarter of the population have prehypertension.³ RISKESDAS results shows that the prevalence of hypertension in Indonesia was 26,5%.⁴

Among hypertensive patients in USA 11% were not on treatment regimen, 25% were not on adequate treatment, 34% were on adequate treatment.³ In Indonesia, among hypertensive patients only 9,5% were on treatment.⁴ In a recent analysis of National Health and Nutrition Examination Survey (NHANES) participants that 35,8 million (53,5%) were not reach blood pressure target. Among these, an estimated 16.0 million (44.8%) were aware of their hypertension and were being treated with medication.⁵ In a cross-sectional analysis of Framingham Heart Study participants, only 48% of treated participants were controlled to <140/90 mm Hg and less than 40% of elderly participants (>75 years of age) were at a goal blood pressure.⁶ These data suggested that hypertension remained largely uncontrolled worldwide. Uncontrolled hypertensive confer an increased of cardiovascular events. Nearly one fourth of adults with uncontrolled hypertension have stage 2 hypertension (systolic BP \geq 160 mmHg or a diastolic BP \geq 100 mmHg), putting them at higher risk for heart disease or stroke.⁵ According to the World Health Report uncontrolled hypertension causes over 7 million premature deaths, takes up 4.5% of the total global disease burden, and accounts for some 64 million disability adjusted life years lost.⁷

Randomized controlled trials have convincingly shown that treatment of hypertension reduces the risk of stroke, coronary heart disease, congestive heart failure, and mortality.⁸ However it

was not easy to achieve blood pressure target. It required an act of antihypertensive medication therapy. The success of a therapy was not only determined by the diagnosis and appropriate drug selection, but also to carry out the patient's therapy compliance, included compliance in taking medication but in fact, adherent of medication was poor.⁹ Moreover, non pharmacology therapy that treated hypertension is dietary of sodium. Reducing dietary sodium additives may decrease hypertension prevalence by 30%, resulting in one million fewer hypertensive patients.¹⁰ It remains lacking data regarding controlled hypertension in Indonesia up to now. Therefore this research aimed to to investigate medication adherence and sodium consumption to achieve blood pressure target.

METHODS

Eighty three adult hypertensive patients (61,61 \pm 8,867 years old, 60,2% man) was randomly selected among patient visited to outpatient cardiovascular clinic dr. Saiful Anwar General Hospital. Blood pressure measured with the cuff-oscillometric method with a mercury arm-cuff device. Patients seat quietly for at least 5 minute in a chair with feet on the floor and arm supported at heart level. Uncontrolled hypertension defined as office blood pressure measurement of systolic blood pressure (SBP) >140 or diastolic blood pressure (DBP) >90 mmHg, except for diabetes mellitus or chronic kidney disease > 130/80 mmHg at least during 2 clinical visits. Medication adherence was assessed using Morisky medication adherence scale with scores ranging from 0-5 (low compliance), 6-7 (medium compliance), and 8 (high compliance). Regimen was assessed by counting the number of types of drugs consumed in a month. Sodium consumption was measured by Food Frequency Questionary (FFQ) that consist of what they consumed of food in a month and then scores ranging \leq 2,4 gram/day sodium (low sodium intake) and >2,4 gram/day sodium (high sodium intake).

RESULTS

Baseline Characteristic

Baseline characteristics of the sample revealed that 60,2% were male. Among sample only 37,3% reached blood pressure target, even the subjects have taken medicine regularly, 70,9% of them consumption of sodium $\leq 2,4$ gram/day and 61,3% of them have taken 3 or more antihypertensive drugs. Data presented in table 1 was grouped into controlled uncontrolled hypertensive patients. There were no significant differences in age, sex, last study, duration of suffering hypertension, mean of Antihypertensive drugs used and medication adherence.

Table 1. Baseline Characteristic

Characteristic	Controlle d	Uncontrolle d	p
Sample	N = 31	N = 52	
Age*	60,81 SD $\pm 7,998$	62,10 SD \pm 93,90	0,34 7
Sex			
Male	18 (58,1)	32 (61,5)	0,75
Female	13 (41,9)	20 (38,5)	8
Last study			
Uncompleted elementary school	0 (0)	1 (1,9)	
Elementary school	0 (0)	1 (1,9)	
Junior high school	2 (6,5)	7 (13,5)	
Senior high school	21 (67,7)	28 (53,8)	0,64
College	8 (25,8)	15 (28,8)	
Duration of Suffering Hypertension (year)*	6,74 SD \pm 4,374	8,94 SD \pm 7,158	0,46 5
Diabetes Mellitus			
Yes	0 (0)	7 (13,5)	0,03
No	31 (100)	45 (86,5)	3
Systolic Blood Pressure I*	122,97 SD $\pm 22,943$	157,69 SD \pm 19,364	0,00 0
Diastolic Blood Pressure I*	77,10 SD $\pm 6,925$	90,77 SD \pm 11,521	0,00 0
Systolic Blood Pressure II*	127,10 SD $\pm 4,614$	145,38 SD \pm 13,786	0,00 0
Diastolic Blood Pressure II*	78,39 SD $\pm 4,544$	85,96 SD \pm 10,339	0,00 0
Mean of Antihypertensive drugs used*	2,94 SD \pm 0,854	2,73 SD \pm 0,564	0,31 5

Adherence

Low	13 (41,9)	13 (25,0)	0,18
Medium	10 (32,3)	22 (42,3)	3
High	8 (25,8)	17 (32,7)	
Mean Sodium Intake (gram)*	2,210 SD $\pm 0,566$	2,573 SD \pm 0,740	0,01 1
Sodium Intake			
Low	22 (71)	20 (38,5)	0,00
High	9 (29)	32 (61,5)	4

*Data presented as number of sample = n, (% of total sample) except * in mean \pm SD

Controlled Hypertension

In this group the majority of patients used two combination of antihypertensive drugs.

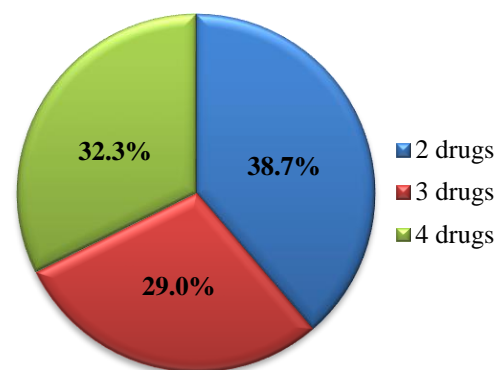


Figure 1. The Amount of Antihypertensive Agents Used in Hypertensive Patient Achieving Blood Pressure Target

The target blood pressure was majority achieved by taking two or four antihypertensive drugs (71%). Statistical analysis showed that there was no significant correlation between medication adherence and achieving blood pressure target (p=0,183). Only 31 patients achieving blood pressure target. Yet, there is sodium intake influence of blood pressure target (see figure 2).

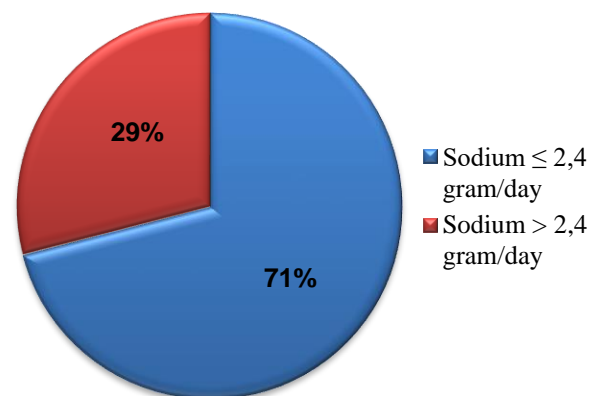


Figure 2. The Amount of Sodium Consumption in hypertensive Patient Achieving Blood Pressure Target

There is only 22 patients (71%) achieving blood pressure target that consumpt natrium less than 2,4 gram/day. Eventhough there is showed a correlation between sodium intake and bloodpressure target ($p=0,004$) but there is weak correlation between them.

Uncontrolled Hypertension

Among hypertensive patients 62,7% didn't achieve blood pressure target and most of them recieve 3 drugs combination (61,5%) (see figure 3).

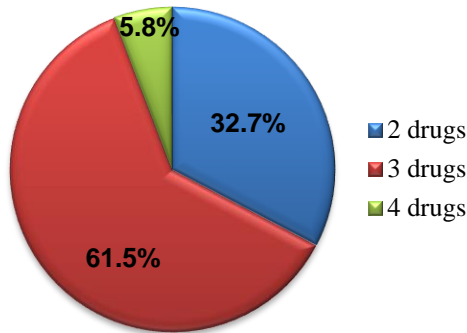


Figure 3. The Amount Antihypertensive Treatment Among Uncontrolled Hypertension

In this uncontrolled hypertension group, the high prevalence was medium adherence medication (42,3%) eventhough they are taking medicine regularly. Statistical analysis showed that there were no association between uncontrolled hypertension and adherence medication ($p=0,183$). Moreover, uncontrolled hypertension was significantly influenced by sodium intake (see figure 4.)

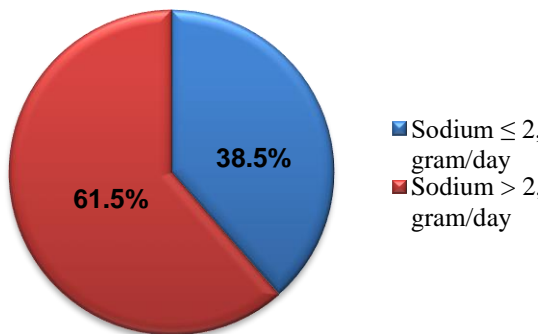


Figure 3. The Amount of Sodium Consumptio Among Uncontrolled Hypertension

32 hypertensive patient (61,5%) was consumpt sodium more than 2,4 gram/day that affected bloodpressure target. There was significant correlation between uncontrolled hypertensive and sodium intake ($p=0,004$) eventhough there are weak positive correlation ($r=0.315$) it means more high sodium intake then it can make uncontrolled hypertension.

DISCUSSION

The results of this study suggest that there was only few patients achieving blood pressure target. Among achieving blood pressure target have taken 2 drugs and sodium intake less than 2,4 gram/day. Based on the research that 50%-75% hypertensive patients didn't have adequat control with blood pressure¹¹ whereas Morgado *et al.*, (2010) revealed that 56% hypertensive patients didn't have adequat control with blood pressure.¹² Based on the research by Jessica & janel (2010) that male with age 19-30 years and 31-50 years and older, the average consumption sodium of 3124 and 3088 mg/day because of their activity and their metabolism more high than female.¹³ Based DASH showed that sodium restriction 1500mg/day can decrease blood pressure for old people than young people.¹⁴

Uncontrolled hypertension also caused by low adherence medication. Non adherent medication can increase if the treatment was not practic because the patient sometimes forget taken medication and then increase the dosage of medication and sometimes didn't taken medication routinely. According to research, explained that there is a reversed correlation which has been research between medication compliance and the quantity of medicinine advocated by physician.¹⁵ One drugs had high medication compliance with an average of 79% than 90% patients who taken medicine 3 drugs or more. It is supporting by research Wang *et al* (2002) that explained differences in medicine complain between 1 drug and more than 2 drugs with the evidence of eight research reported that the average medicine adherence to dose one drug is significantly higher several types of medicines.¹⁶

CONCLUSION

This study suggested the high prevalene of uncontrolled hypertension in patients high adherence medication for 64,5% and most of them already took $>$ 2,4 gram/day sodium intake. Regimen was the factors of medication adherent. The increasing number of quantity of drug used then the medication adherent will be decrease. It was because if the quantity of medicine was little, it could help patients to consumpt medication yet patients didn't forget to consumpt it. Then it is advisable to restrict sodium intake eventhough they are already high adherent medication. Limitation of this study was the criteria of uncontrolled BP only observed by office blood pressure measurement not by ambulatory blood pressure monitoring.

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