

The Relationship Between Hormonal Contraception Use with the Occurrence of Hypertension Among Women at reproductive age at Kassi-Kassi Health Center Makassar

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Abstract. The use of hormonal contraception will affect the balance of hormones in our body. This study aims to determine the relationship between the use of hormonal contraception and cases of hypertension in women who are married at reproductive age at Kassi-Kassi Society Health Center conducted quantitatively using a cross-sectional approach. with a population of women aged 15-49 years who have actively taken hormonal contraception in the Kassi-Kassi community health center. The sampling technique using Proportional Stratified Random Sampling with a total of 386 samples. Data collection was carried out directly in the field of research, and measurement of blood pressure. Data analysis was performed using the Chi-square statistical test. The results showed that women who were married at reproductive age who had been using hormonal contraception for a long time were 2.759 times at risk of hypertension. In addition, women who use hormonal contraception regularly are 1,392 times at risk of hypertension and women who use hormonal contraception for more than 35 years are 1,403 times at risk of developing hypertension, and there is no relationship between education of acceptors, occupations of acceptors and types of hormonal contraception with cases of hypertension. Finally, this study shows that it is important to conduct a preliminary examination before choosing the type of contraception.

Keywords: Hormonal Contraception, Hypertension, Women at reproductive ages

1 Introduction

Hypertension is one of the many public health problems suffered in the world, including Indonesia. Hypertension is a disease that occurs because of an increase in blood pressure in the body that goes beyond the normal limits that are influenced by certain factors [1]

World Health Organization (WHO) reported that in several countries, including Indonesia, Non-Communicable Diseases constitutes 52% of the causes of death in the world, and one of them is Hypertension [2]. In 2012 at least 839 million cases of hypertension and is estimated in 2025 to be 1.15 billion or around 29% of the total world population and more female sufferers (30%) than men (29%).

Basic Health Research (Riskesdas) in 2013 showed a decrease in the prevalence of hypertension to 25.8%. In women, 28.8% and men 22.8%. Hypertension in women tends to be higher than in men [3]. Based on data from Non-Communicable Diseases obtained from the Makassar City Health Office in 2015, it was found that hypertension was the first highest incidence in the city of Makassar, namely the prevalence of hypertension in men was 14,048 people while women suffering from hypertension amounted to 21,271 people and based on data on the number of new cases of hypertension in 2015 obtained hypertension in men amounting to 4326 people, while in women as many as 7332 people. Based on data obtained from the Kassi-Kassi Health Center in the last 3 months in 2016 data was obtained that the incidence of hypertension in these primary health care increased from 123 cases to 507 cases [4].

Risk factors for hypertension that cannot be changed are age, sex and genetic, while those that can be changed include obesity/obesity, psychosocial and stress, smoking, lack of exercise, excessive alcohol consumption, hyperlipidemia/hypercholesterolemia, while secondary causes of hypertension include kidney disease, endocrine disorders and use of drugs such as oral contraceptives and tools other contraceptives that can trigger an increase in blood pressure [5]. In hormonal contraceptives such as Oral, injections, and implants contain the hormones estrogen and progesterone, which can affect the increase in blood pressure. This is due to cardiac hypertrophy and an increase in the response of II angiotensive predators involving the Renin Angiotensin System pathway. In addition, hormonal contraception also contains ethinylestradiol which is the cause of hypertension, while Gestagen has a minimal influence on blood pressure. Ethinylestradiol can increase angiotensinogen 3-5 times the normal level [6]. This is supported by a study in the city of Manado in 2014 that users of Oral contraception had a risk of 3,458 times experiencing hypertension in women at reproductive age compared to women at reproductive age who did not use Oral contraception [7].

According to data from the World Health Organization (WHO) in 2013, contraceptive use in Indonesia when compared to other ASEAN member countries Indonesia is indeed above the average number of other contraceptive users, namely 61% and the highest is Thailand with a percentage of 80% and most use of contraceptives at the same time that is of great interest in women at reproductive age are contraceptive pills or Oral and injectable contraception [8]. In South Sulawesi province the number of active family planning participants in injecting contraceptive users experienced an increase as many as 439,462 participants in 2013 and 461,639 participants in 2014 while the number of active family planning participants in contraceptive pill users decreased, namely the number of active participants as much as 313,811 in 2013 and 2014 decreased to 301,998 participants [9]. Based on the data of Makassar City Contraceptive Device users in 2015, it was found that out of 46 health centers located in Makassar City, Kassi-Kassi Health Center was the largest number of KB users, namely 11,525 users and the lowest was Kodingareng Health Center as many as 642 users. The Kassi-Kassi Health Center has the highest users of Hormonal contraception, and the most desirable contraceptive devices are injecting contraceptives with 10,150 users, pill with 1041 users and implants with 195 users [4].

The description above explains that the prevalence and incidence of hypertension in women are higher than that of men and the number of users of hormonal contraception in the city of Makassar also continues to increase, especially at the Kassi-Kassi Health Center. The reason for this research was conducted at Kassi-Kassi because the incidence of hypertension was quite high, and this was directly proportional to the users of hormonal contraceptives who tended to increase. Therefore, the researchers took the initiative to conduct this study to analyze the relationship between the use of hormonal contraceptives and the incidence of hypertension.

2 Methods

This type of research was quantitative research with a cross-sectional approach. The population in this study were marriage women at reproductive age (15-49 years) who used hormonal contraception actively at the Kassi-Kassi Health Center. The sampling technique used was proportional stratified random sampling with a total sample of 386. Data collection was carried out directly, and blood pressure measurements were carried out by the research procedure. This study used instruments in the form of questionnaires and observation sheets and data analysis used a chi-square statistical test to answer the hypotheses [10-12].

3 Result and discussion

3.1 Univariate Analysis

Based on Table 1, the characteristics of respondents in the Kassi-Kassi Health Center in Makassar City showed that of the 386 respondents, the highest age group was the 35-39 year age group of 101 people (26.2%), while the least age group of respondents was the age range 15-19 years as many as 4 people (1.0%), the most education is graduating from high school / equivalent as many as 194 respondents (57.4%) while the education of the least respondents is graduating from Academy / Diploma as many as 4 Respondents (1.0%) The occupation that most respondents are involved in is the housewife as many as 351 people (90.9%), while the occupation of the respondents who are the least are 7 people (1.8%). The type of contraception used was 269 respondents (69.7%) who used 3-month injections and 7 respondents (1.8%) who used implants. Based on the length of use of hormonal contraception using hormonal contraception ≤ 3 years, while respondents who used > 3 years were 137 people (35.5%), while based on regularity of use, there were 249 respondents (64.5%) who used hormonal contraceptives irregular, while those who use regularly are 137 respondents (35.5%).

Table 1. Characteristics of women at reproductive age Respondents at the Kassi-Kassi Health Center

Respondents Characteristics	n	%	
Age level	15-19 year	4	1
	20-24 year	35	9,1
	25-29 year	79	20,5
	30-34 year	96	24,9
	35-39 year	101	26,2
	40-44 year	49	12,7
	45-49 year	22	5,7
Education	Not School	20	5,2
	Elementary	43	11,1
	Junior High School	97	25,1
	Senior High School	194	50,3
	Academy/Diploma	4	1
Occupation	Bachelor	28	7,3
	Housewife	351	90,9
	Entrepreneur	7	1,8
	Civil Servant	16	4,1
Type of Hormonal Contraception	Official Employee	12	3,1
	Pill – Combination	35	9,1
	Injection 1 month	75	19,4
Duration Use of Hormonal Contraception	Injection 3 month	269	69,7
	Implant	7	1,8
Regularity Use Hormonal Contraception	≤3 Year	249	64,5
	>3 Year	137	35,5
Regularity Use Hormonal Contraception	Teratur	137	35,5
	Tidak Teratur	249	64,5

3.2 Bivariate analysis

Based on Table 2, it can be seen that the relationship between age group and hypertension incidence at Kassi-Kassi health center using Chi-Square statistical test, obtained $p = 0.014$ ($p < 0.05$) and prevalence ratio 1.403 ($RP > 1$), so that there is a significant relationship between age of hormonal contraceptive users to the incidence of hypertension at the Kassi-Kassi health center, and the prevalence ratio values indicate that hormonal contraceptive users who have age above 35 years have a 1.4 times greater chance of experiencing hypertension than under 35 years of age. The relationship between the education of hormonal contraceptive users and

the incidence of hypertension found that the p-value = 0.152 ($p > 0.05$) and the prevalence ratio was 0.820 (Rp <1), so there was no significant relationship between the education of hormonal contraceptive users on the incidence of hypertension, as well as occupation users of hormonal contraception and types of hormonal contraception used by women at reproductive age with the incidence of hypertension, where the results obtained were statistically $p = 0.293$ ($p > 0.05$) and $p = 0.174$ ($p > 0.05$).

Table 2. Bivariate Analysis of the Relationship between the Use of Hormonal Contraception with Hypertension Events in women at reproductive age at the Kassi-Kassi Health Center

Variables	Hypertension Events		Total	p-value	RP
	Yes	No			
Acceptor Age	High Risk (>35 year)	63 (42,90%)	84 (57,1%)	0,014	1,403
	Low Risk (≤ 35 year)	73 (30,50%)	166 (69,50%)		
Acceptor Education	High	73 (32,3%)	153 (67,7%)	0,152	0,82
	Low	63 (39,4%)	97 (60,6%)		
Acceptor Education	Unemployee	127 (36,2%)	224 (63,8%)	0,293	1,407
	Employee	9 (25,7%)	26 (74,3%)		
Type of Hormonal Contraception	Progestin Only	103 (37,3%)	173 (62,7%)	0,174	1,244
	Combination	33 (30,0%)	77 (70,0%)		
Duration Use of Hormonal Contraception	>3 year	82 (59,9%)	55 (40,1%)	0,000	2,759
	≤ 3 year	54 (21,7%)	195 (78,3%)		
Regularity Use Hormonal Contraception	Regular	59 (43,1%)	78 (56,9%)	0,017	1,392
	Irregular	77 (30,9%)	172 (69,1%)		

3.3 Discussion

This research was conducted by conducting interviews and blood pressure measurements in women at reproductive age at the Kassi-Kassi Health Center with a cross-sectional study design. The variables used in this study were six variables, including user age, user occupation, user education, types of hormonal contraception used, duration of hormonal contraceptive use, and regular use of hormonal contraception. The results of this study are in line with previous literature which states that hormonal contraceptives such as Oral, injections, and implants contain the hormones estrogen and progesterone which can affect the increase in blood pressure [13-16]. This is due to cardiac hypertrophy and an increase in the response of II angiotensive predators involving the Renin-Angiotensin System pathway. Also, hormonal

contraception contains ethinylestradiol, which is the cause of hypertension, while Gestagen has a minimal influence on blood pressure. Ethinylestradiol can increase angiotensinogen 3-5 times the normal level [6]. Among the six variables studied were three variables related to the incidence of hypertension in women at reproductive age at the Kassi-Kassi Health Center, namely the age of hormonal contraception users, the length of use of hormonal contraception and regular use of hormonal contraception.

Relationship between age of hormonal contraceptive users and incidence of hypertension

Age of users of hormonal contraception is related to the incidence of hypertension. This is due to high-risk hypertension at the age of > 35 years because based on research that the increasing age of a woman, the estrogen beta (ER- β) receptor in the body will also increase [17]. In a study about women who use estriol orally or injection will increase systolic blood pressure because the body will produce estrogen receptor ER- β (Estrogen Receptor-Beta) more dominant [18]. When estrogen in the body increases, the body will automatically produce estrogen receptor ER- β (Estrogen Receptor-Beta) which is more dominant to metabolize estrogen in the body and metabolized estrogen will increase blood viscosity. Different genes encode both forms of estrogen receptors, ESR1, and ESR2 on chromosomes 6 and 14 (6q25 and 14q). Both of these receptors are widely expressed on a variety of tissues, which are different, with different expression patterns. Er α is found in the endometrium, ovarian stromal cells, and in the hypothalamus. Er β is found in the kidneys, brain, bones, heart, intestinal mucosa, prostate, and endothelial cells. ER in the unliganded phase is a cytoplasmic receptor, but research shows that the ER fraction shifts into the nucleus [19].

The results obtained are in line with the research that there was a relationship between the age of hormonal contraceptive users and the incidence of hypertension with p-value = 0.00 and RP = 1.73 [1].

Relationship Length of use of hormonal contraception with the incidence of hypertension

Long-term use of hormonal contraceptives can also lead to increased blood pressure [20]. High increase in blood pressure is systolic blood pressure, which is directly correlated with increasing age and increasing body mass index [1]. Hypertension or blood pressure > 140/90 mmHg is found in 2-4% of women who use pill contraception, mainly containing ethinylestradiol, this condition is closely related to women's age and duration of use, the incidence of hypertension increases 2-3 times after 4 years of use of contraceptive pills which contains estrogen [6]

In other literature also mentioned that contraceptive pills could increase blood pressure. Increased blood pressure in pill contraceptive users is associated with cardiac hypertrophy and an increase in the response of prescription angiotensin II by involving the Renin-Angiotensin System pathway [21]

the relationship between the length of use of hormonal contraception and the incidence of hypertension that there was a relationship between the length of use of hormonal contraceptive methods and the incidence of hypertension in RW 02 Ngaliyan Sub-district Semarang p = 0.034 and mother the long time using hormonal contraception method 2.954 times the risk of developing hypertension compared with mothers who did not use hormonal contraception for a short time (OR = 2.954) [22].

Relationship of Regularity Use of hormonal contraception with the incidence of hypertension

The regularity of hormonal contraceptive use was a new variable added by the researcher by conducting interviews and control card control of family planning users, and the results showed that there was a relationship between regularity of hormonal contraceptive use and hyper lapse incidence with $p = 0.017$ ($P < 0.05$) and women at reproductive age. Those who use hormonal contraception regularly are more at risk of developing hypertension with $R_p = 1.392$. In this study, there were 136 respondents with hypertension and 59 respondents (43.1%) who used hormonal contraception regularly and 77 respondents (30.9%) who did not use hormonal contraception. All types of hormonal contraception are contraindicated in that after the termination of pill contraception, blood pressure will normally be normal again, but if this did not occur it needs to be given antihypertensive medication, in other words, women at reproductive age who use contraception regularly without stopping will increase blood pressure and when irregular or stop using hormonal contraception will make his blood pressure normal again, but there are also those who did not regularly use hormonal contraception and still experience hypertension, so they need to be given antihypertensive drugs [6].

4 Conclusion

There is a relationship between the length of use of hormonal contraception and the incidence of hypertension, there is a relationship between regular use of hormonal contraception and the incidence of hypertension, there is a relationship between the age of hormonal contraceptive users and the incidence of hypertension and there is no relationship between acceptor education, occupation of acceptor and acceptor hormonal contraception on the incidence of hypertension . It is better to have a blood pressure check before, and a history of hypertension before using hormonal contraception and the women at reproductive age should choose the right contraceptive method.

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