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RESEARCH ARTICLE
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Characteristics of Polycystic Ovary Syndrome Polycystic (PCOS) at Soetomo General Hospital, Surabaya

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ABSTRACT

PCOS is an endocrine disease that occurs in women of reproductive age which is characterized by several clinical manifestations such as hyperandrogen, ovarian dysfunction, and polycystic ovarian features on ultrasound examination. PCOS is an endocrine disease that is closely related to metabolic diseases such as dyslipidemia, diabetes mellitus, and hypertension. Risk factors for this disease are age, environment, genetics, body mass index (BMI), and androgen exposure. The purpose of this study is to determine the profile of PCOS in Soetomo General Hospital, Surabaya. This study used a descriptive retrospective method, using medical record data at the obstetrical clinic at Soetomo General Hospital and fertility clinic at Graha Amerta. Most patients were found in the age range of 25-44 years. Based on the diagnosis of Rotterdam criteria, the phenotype D (Oligo / Amenorrhea and SOPK on USG) was the highest phenotype. People with PCOS who did not have metabolic diseases more than those who have. The highest number of sufferers was found in the category of overweight and obese BMI, which was 35.3% each. Most PCOS sufferers were reproductive age and most have phenotype D. Most sufferers have overweight and obese BMI and do not have metabolic diseases.

Keywords: PCOS; infertile; retrospective

INTRODUCTION

Background

Polycystic Ovary Syndrome or PCOS is an endocrine disease that occurs in women of reproductive age characterized by several clinical manifestations such as hyperandrogen, ovarian dysfunction, and ovarian polycystic features on ultrasound examination[(1)]. SOPK attacks women of reproductive age and clinical manifestations of this disease appears after puberty[(2)]. However, it is often found after women aged 20-30 years due to lack knowledge of this disease[(3)]. Risk factors for PCOS include age, environment, genetic factors, Body Mass Index (BMI), and androgen exposure. Signs and symptoms of PCOS patients can differ according to the patient's condition[(4)].

Although the pathogenesis of PCOS is complex and cannot be known with certainty, but basically the disruption of GnRH hormone signaling and insulin resistance plays an important role in the etiology of this disease[(5)]. Significant signaling disorder is the ratio of Lutinizing Hormone (LH) hormone secretion to Follicle-Stimulating Hormone (FSH) which causes interference with the theca and granulosa cells in the ovary, thus giving the effect of excessive androgen hormone secretion and causing hyperandrogens.

Another known cause of PCOS is insulin resistance. Insulin resistance is defined as the inability of insulin to carry out its physiological functions. Insulin resistance causes a disruption in the process of glucose metabolism which can cause body cells to not have sufficient glucose levels, which can then result in hyperinsulinemia as a form of body compensation. Hyperinsulinemia that occurs is known to increase the risk of

hyperandrogen due to decreased levels of Sex Hormone-Binding Globulin (SHBG), which functions to bind to androgens and testosterone in the blood. In addition, PCOS patients with hyperandrogens can increase insulin levels in the body. Therefore, insulin resistance plays a role in metabolic defects, as well as being one of the etiologies for PCOS[6].

The study of PCOS in Indonesia, especially Surabaya, is still limited. Based on the description above, this research wants to conduct a study regarding the data of PCOS patients, based on age, sign and symptom, metabolic diseases, and BMI at Soetomo General Hospital, Surabaya period January 2013 - December 2018.

Purpose

The purpose of this research is to know the profile of PCOS in Soetomo General Hospital, Surabaya period January 2013 - December 2018.

METHODS

This research was a retrospective descriptive study that aims to identify the profile of PCOS sufferers at Soetomo General Hospital, Surabaya. The research material was taken from the medical records of patients with PCOS on obstetric clinic at Soetomo General Hospital and fertility clinic Graha Amerta Soetomo General Hospital, Surabaya for the period of January 2013 until December 2018. This research was conducted from April 2018 until September 2019.

Sampling was done by total sampling. The population in this research were all women that suffers PCOS at Soetomo General Hospital, Surabaya. The study exclusion criteria were all women with PCOS at Soetomo General Hospital, Surabaya with incomplete or missing variable data. The research data obtained as many as 79 samples, but there are 45 samples that do not meet the inclusion criteria, so the total data obtained as many as 34 samples. Of these 34 samples, 24 samples were obtained from obstetric clinic, and 10 samples were obtained from fertility clinic graha amerta Soetomo General Hospital, Surabaya.

Until the December 2018, there were 36 samples found. Then, the data is processed based on the data obtained. The data was presented by table and chart. Ethic test has been done by Soetomo General Hospital ethical committee with no. letter 0895/KEPK/2019.

RESULTS

Table 1. Distribution of PCOS patients in Soetomo General Hospital, Surabaya January 2013 - December 2018 based on age

Age	Frequency	Percentage
5-14	0	0
15-24	9	25
25-44	27	75
45-64	0	0
Total	36	100

Most PCOS patients were in the age range of 25 – 44 years, followed by patients with an age range of 15 – 24 years. The youngest patient was 17 years old, and the oldest was 39 years old.

Table 2. Distribution of PCOS patients in Soetomo General Hospital, Surabaya Period January 2013 December 2018 based on signs and symptoms for diagnosis

Signs and symptoms	Yes (+)		No (-)	
	Frequency	Percentage	Frequency	Percentage
Polycystic feature	34	100	0	0
Anovulation	33	97	1	3
Hyperandrogen	9	26.5	25	73.5

Table 3. Distribution of PCOS patients in Soetomo General Hospital, Surabaya Period January 2013 - December 2018 based on phenotype for diagnosis

Phenotype type	Amount	
	Frequency	Percentage
A (HA, OA, Polycystic feature)	8	23.5
B (HA, OA)	-	0
C (HA, Polycystic feature)	1	3
D (OA, Polycystic feature)	25	73.5

Table 2 shows that all samples had polycystic ovarian features, only 26.5% had signs and symptoms of hyperandrogen. According to Table 3, phenotype D was the most common phenotype found in PCOS patients.

Table 4. Distribution of PCOS patients in Soetomo General Hospital, Surabaya Period January 2013 - December 2018 based on comorbidities

Criteria	Frequency	Percentage
Has comorbidity	15	44.2
Does not have comorbidity	19	55.8
Total	34	100

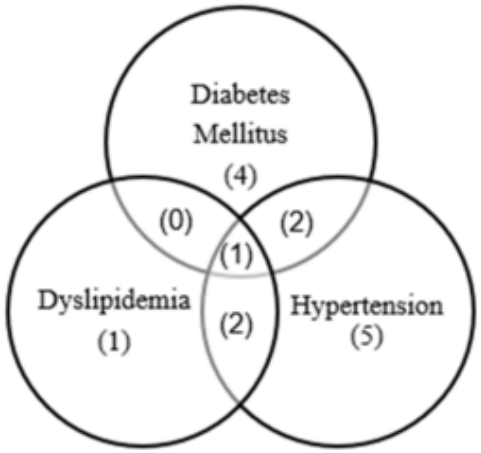

Figure 1. Distribution of PCOS patients in Soetomo General Hospital, Surabaya Period January 2013 - December 2018 based on comorbidity

Based on Table 4 and Figure 1, the amount of PCOS patients who did not have metabolic diseases was more compared than PCOS patients who have comorbidities. Hypertension was the most common comorbid disease, followed by diabetes mellitus, while the least was dyslipidemia. Patients could also have more than one metabolic disease.

Table 5. Distribution of PCOS patients in Soetomo General Hospital, Surabaya Period January 2013 - December 2018 based on IMT

Criteria		Frequency	Percentage
Underweight	<18.5	0	0
Normal	18.5 – 24.99	10	29.4
Overweight	25 – 29.99	12	35.3
Obesity	>30	12	35.3
Total		34	100

Table 5 shows that most PCOS patients had BMI with overweight and obesity categories.

DISCUSSION

PCOS patients found at Dr. Soetomo General Hospital, Surabaya from January 2013 to December 2018 that were included in this study's inclusion amounted to 34 patients. Based on Table 1, it is known that PCOS patients who are of reproductive age (25-44 years old) are more than those of adolescents (15-24 years old). These results were in line with studies conducted by previous study by Wiweko and Mulya (2008), pointed out that out of 44 PCOS women, only 7% were aged ≤20 years, the rest are women of reproductive age (> 20 years)[(5)].

This happens because in adolescence, signs and symptoms that describe PCOS have a risk of overlapping with normal conditions. At the age of adolescence, menstrual disorders are common, because at that age there is a risk of experiencing menstrual disorders approximately 1-2 years after menarche, and there is a risk of similarity between polycystic features of normal ovarian features in adolescent women[(7)].

In addition, there are psychological factors, hormonal factors, lifestyle, and others that can cause teenage women to often experience menstrual disorders[(8)]. Acne, which is a result of high androgen levels, also often occurs in normal adolescent women, so it is recommended for adolescent women suspected of having PCOS to use androgen levels as a reference for diagnosing PCOS[(9)].

Basically, an increase in androgen hormones occurs in women who are in their teens or who are of reproductive age. Then, as time approaches menopause or late adulthood, there will be a slow decline. Based on the androgen state, the risk of PCOS in adolescents and adults is basically the same. The thing that makes the difference is patient awareness because in adolescence, it is often underdiagnosed because the signs and symptoms that appear do not become a significance complaint. But most of the women with reproductive age consider signs and symptoms of PCOS to be a significant complaint because they know that their hormonal condition is stable.

In addition, for women of reproductive age who are married, infertility is also an important complaint that drives women of reproductive age to come to health workers[(10)]. Therefore, PCOS patients who are reproductive age are more than those of adolescents.

In accordance with tables 2 and 3, all patients had polycystic feature on ultrasound examination and there were 26.5% of patients who had hyperandrogen signs, and also from various kinds of signs and symptoms that appeared, phenotype D (oligo / amenorrhea and polycystic features) was the most phenotype that appeared. As the name implies, PCOS is a syndrome or a collection of several diseases, so that the signs and symptoms that appear also vary. Therefore, experts make a diagnostic criteria. The diagnostic criteria proposed by NIH and the Endocrine Society are the Rotterdam criteria in 2003, where patients with PCOS must fulfill 2 of 3 signs, namely hyperandrogen, polycystic features on ultrasound examination, and oligo / amenorrhea[(11)]. The findings of this study are similiar with studies conducted by Guraya (2013), reports that of 201 women diagnosed with PCOS, there were found Polycystic features as much as 89.8% [(12)]. The findings of this study are also in line with the results of the study conducted by Wahyuni et al. (2015), who reported that from 105 samples of PCOS patients, all samples experienced symptoms of amenorrhea or oligomenorrhea. They also reported that there were only 0.95% who experience symptoms of hirsutism[(13)].

Of the three signs, people with PCOS have a variety of phenotypes, including phenotypes A (hyperandrogen, oligo / amenorrhea, and polycystic features), B (hyperandrogen, and oligo / amenorrhea), C (hyperandrogen, and polycystic features), and D (polycystic oligo / amenorrhea, and polycystic features)[(14)]. Research findings were similar with previous study conducted by March (2010) which states that of 728 PCOS sufferers, the phenotype D symptoms was the most frequent symptom[(15)]. but these findings can also be vary according to the environmental conditions of each region [(14)].

High levels of androgens and a high ratio between LH hormones versus FSH, are known to play an active role in the process of formation of small follicles in the PCOS feature on ultrasound examination. The change in morphology and number of follicles will have an impact on the menstrual cycle of women. In patients with PCOS, there is an inadequate hormone interaction for follicular maturation, so ovulation does not occur[(6)].

Based on the results of the study in table 4, PCOS patients who do not have metabolic diseases (55.8%) are more than PCOS patients who have comorbidities (44.2%). Research conducted in various countries also shows that PCOS patients who have comorbidities have fewer numbers than those who do not[(16)]. Metabolic diseases that occur in PCOS patients are known to be not directly occurring, because they have to go through a process of interaction of various factors and it is known that comorbidities that occur in PCOS require a follow-up process - dozens of years from patients diagnosed to find out what diseases arise[(17)].

Figure 1 shows that hypertension is the most common disease in PCOS patients, followed by diabetes mellitus, then dyslipidemia. To be noted that the examination of lipid profile is not routine was carried out at the study site. Previous study from Wild and colleagues (2000), say that PCOS can improve the risk of getting

comorbidities, they say that PCOS can increase the risk of suffering from diabetes, hypertension, and lipid disease[18].

Insulin resistance, which is one of the key factors for the occurrence of this disease, is known to have effects on metabolic and reproductive processes, including hypertension, dyslipidemia, and diabetes mellitus[19]. Insulin resistance has an effect in the form of glucose intolerance which is one of the predisposing factors for type 2 diabetes mellitus[4]. Dyslipidemia is also often found in people with PCOS characterized by high levels of triglycerides and low levels of High Density Lipoprotein (HDL). Insulin resistance plays an important role in the occurrence of dyslipidemia through the mechanism of lipolysis and changing the expression of lipoprotein lipase and hepatic lipase[20]. In addition, hypertension in PCOS patients is also chained out by insulin resistance and hyperinsulinemia, both of which cause hypertrophy of vascular smooth muscle, which in turn causes a decrease in blood vessel function, disruption of the vasodilation mechanism, and activation of the renin-angiotensin-aldosterone system (RAAS) and sodium retention[21].

The results of the study in table 5 show that of all the samples examined, the BMI categories were mostly overweight and obesity, which accompanied PCOS patients with 35.3% each. So if totaled, there are 70.6% of PCOS patients who have a BMI of ≤25. This is also consistent with the study conducted by Sam (2007) who reported that the prevalence of obesity or overweight in people with PCOS was around 60-80%[22].

Being overweight or excess nutrition is known to increase the risk of damage to pancreatic B cells, as well as damage to glucose tolerance in the body that leads to insulin resistance. Insulin resistance makes cells in the body to be unable to receive glucose so there will be a buildup of insulin in the blood or hyperinsulinemia due to the pancreas trying to compensate[23]. In addition, obesity is known to have an active role in the occurrence of insulin resistance mediated by inflammatory mechanisms, mitochondrial activation, and hyperinsulinemia[24]. Until now, obesity as a cause or a result of PCOS is still not known, but obesity is a factor that can worsen the clinical manifestations of PCOS. The interaction between obesity and PCOS is known to have a relationship in the occurrence of hyperandrogens, insulin resistance, dyslipidemia, and increase the risk of other metabolic diseases[25].

CONCLUSION

Based on the results of the study, it can be concluded that most PCOS patients at the Soetomo General Hospital, Surabaya period January 2013 – December 2018 were in reproductive age and phenotype D was the most phenotype found. Most sufferers were overweight and obesity, and has no metabolic disease

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