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Yoga Exercises in Reduce Homa-Ir and Insulin Levels in Polycystic Ovarium Syndrome (PCOS) Insulin Resistant

Zakkiyatus Zainiyah[1*], Muhammad Suhron[2]
[1,2] STIKes Ngudia Husada Madura, Indonesia
**Corresponding author: zzainiyah@gmail.com*

ABSTRACT

Background: Polycystic Ovary Syndrome (PCOS), an endocrine disease that causes infertility in reproductive women, characterized by hyperandrogenemia, chronic anovulation, and Polycystic Ovary Morphology (PCOM), most PCOS women have metabolic disorders. The HOMA-IR can be used as a clinical index that is easy and sensitive to assess ovarian function in insulin-resistant PCOS women. The HOMA-IR examination has never been performed on obese PCOS patients in Madurese and Indonesia, it was carried out in Madura because it has the potential for obesity with unfavorable lifestyles such as consuming high carbohydrates and a tendency to obesity in PCOS patients.

Purpose: The aim of this study was to analyze yoga exercises in reducing HOMA-IR and Insulin Levels in insulin-resistant polycystic ovary syndrome (PCOS) in the Madurese.

Methods: Analytic observational study with a case-control study design, a sample of 50 patients (cases of PCOS) and 50 healthy women (non-PCOS) in the Madurese tribe, serum was taken to check HOMA-IR and insulin levels, which were examined in the laboratory. Chi-square statistical test with significance 0.05.

Results: The results Chi-square statistical test with significance 0.05 showed that the case group before being given Yoga exercises the average HOMA-IR results were 40.97 and insulin levels were 61.38πl/ml while in the control group the average HOMA-IR results were 1.54 and average insulin levels were 2.9-21πl /ml, after doing Yoga exercises for 12 times and 2 times a week.

Conclusion: There is a decrease in the HOMA-IR value and insulin levels. The HOMA-IR values and insulin levels decreased between before and after being given gymnastics in the case group.

Keywords: HOMA-IR, insulin, PCOS, yoga exercises

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BACKGROUND

Polycystic Ovary Syndrome is a very heterogeneous symptom of reproductive system disorders, characterized by menstrual disorders (amenorrhea/oligomenorrhea), hirsutism, acne, the causative factors are not fully understood (Zhao, Lv, Li, & Chen, 2016). The prevalence of PCOS is around 4% to 10% of women worldwide (El Hayek, Bitar, Hamdar, Mirza, & Daoud, 2016). The incidence in Madura is around 5.2% and 4.7% of women of reproductive age, and 60% of infertility cases are caused by PCOS.

As defined by the Rotterdam Criteria in 2003, polycystic ovaries produce one ovary of 12 or more follicles with a diameter of 2-9 mm and/or increasing ovarian size >10ml (The ESHRE Rotterdam/ASRM, 2004). The definition of PCOS according to the 2003 Rotterdam criteria was confirmed from the consensus on ESHRE/ASRM, oligo-ovulation or anovulation, increased androgen levels (Hyperandrogenemia) or clinical manifestations of androgen excess (Hyperandrogen) and polycystic ovaries from ultrasound examination results (Ramezanali, Khalili, Arabipoor, Bagheri Lankarani, & Moini, 2016).

Obese PCOS has insulin resistance and insulin sensitivity but is not found in non-obese PCOS women, findings in non-obese PCOS patients are controversial (Layegh, Mousavi, Farrokh Tehrani, Parizadeh, & Khajedaluee, 2016). Obesity occurs 50-80% in PCOS patients compared to non-obese PCOS. Women with PCOS with a BMI of 0.30 kg/m2 are ten times more likely to have impaired glucose tolerance or diabetes when compared to PCOS women with a BMI of 25 kg/m2, and women with a BMI of 25-30 kg/m2 (Gourgari, Spanakis, & Dobs, 2016). Based on the consensus results it was found that obese women with PCOS develop insulin resistance. Conversely, several studies have shown no IR in slim women with PCOS (Reyes-Muñoz et al., 2016).

HOMA-IR and insulin levels have never been carried out in obese PCOS patients in Madurese and Indonesia. This research was conducted in Madura because it has the potential for obesity with an unhealthy lifestyle such as consuming high carbohydrates and a tendency to obesity in PCOS patients. In ASIA and other countries the results are still contradictory, so further research is needed, and HOMA-IR can be used as a reference whether the patient is insulin resistant or not, especially in obese PCOS. 10% BB reduction treatment through Yoga Exercises Various yoga techniques according to the branch of yoga that are adapted to the special needs of yoga practitioners, including hatha yoga. Hatha yoga is the study of the physical body, which includes a range of styles from gentle to athletic. This combination of postures increases the burning of fat in the body by increasing body heat and increasing the speed of the body's metabolism (Panggraita & Soenyoto, 2017). Yoga is very influential in reducing metabolic syndrome or blood sugar, so it can prevent cardiovascular disease (Jin et al., 2006).

METHODS

This research is analytic with case control approach, independent variable Yoga Exercise and HOMA-IR variable and insulin level in Insulin Resistant Polycystic Ovary Syndrome (PCOS) in Madurese Tribe.

The HOMA-IR examination was calculated according to Mattew and insulin levels using serum. The number of respondents was 100, in the case group there were 50 and in the control group there were 50 according to the inclusion and exclusion criteria, in this study the cases selected were new patients with Insulin Resistant Polycystic Ovary Syndrome (PCOS) Madurese native, aged 20-40 years, did not have kidney and liver disease, has 2 clinical symptoms of PCOS, and has been diagnosed with PCOS from an ultrasound by an obstetrician

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and the controls are healthy women who have had one child without a pregnancy program, aged 20-40 years and native of Madura, not using hormonal contraception in In the last 3 months, did not have blood sugar disease, impaired kidney and liver function, regular menstruation with an interval of 21-35 days. Examination of insulin levels using serum and examined through the ELISA Kit.

The case and control groups were interviewed to determine three generations of native Madurese using Pidegree, blood sampling on the 3-5th day of menstruation in the morning and fasting. Chi-square statistical test with significance 0.05 and Number ethical clearence 1054/KEPK/STIKES-NHM/EC/XI/2021.

RESULTS

Table 1. Clinical characteristics of PCOS patients and controls

Characteristics	SOPK	Kontrol	P Value
Age	26.50	31.25	0.000
Weight	62.70	56.05	0.001
Height	155.7	154.5	0.547
IMT (BB/TB^2)	26.06	24.68	0.001
HOMA-IR	40.97	1.54	0.000
Fasting Blood Sugar	172.8	115.02	0.000
Insulin	61.38	2.9	0.000

Table 2. Clinical characteristics of PCOS patients before and after being given yoga exercise treatment

Characteristics	Before	After	P Value
Weight	62.70	60.05	0.001
Height	155.7	155.7	0
IMT (BB/TB^2)	26.06	25.68	0.005
HOMA-IR	40.97	38.63	0.000
Fasting Blood Sugar	172.8	150.02	0.000
Insulin	61.38	45.07	0.000

DISCUSSION

Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders in women of reproductive age, which is characterized by menstrual disorders (amenorrhea/oligomenorrhea), hirsutism, the appearance of acne, alopecia and biochemical examination results obtained increased androgens (Ding, Baio, Hardiman, Petersen, & Sammon, 2004; El Hayek et al., 2016; Manlove, 2011). There are several factors that influence them, including environmental factors, including obesity, foods with high carbohydrates and less activity, causing weight gain which results in obesity and insulin resistance which affects the occurrence of hyperinsulinemia and hyperandrogenic which results in shrinking egg cells resulting in PCOS (Bassiouny, Rabie, Hassan, & Darwish, 2014; Eriksen et al., 2013; Ha, Shi, Zhao, Li, & Chen, 2015; Wu, Xu, Liu, & Bi, 2014).

Based on the results of the study, it was found that between before and after being given yoga there was a significant difference in weight, BMI, fasting blood sugar and insulin. 10% BB reduction treatment through Yoga Exercises Various yoga techniques according to the branch of yoga that are adapted to the special needs of yoga practitioners, including hatha yoga. Hatha yoga is the study of the physical body, which includes a range of styles from gentle to

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athletic. This combination of postures increases the burning of fat in the body by increasing body heat and increasing the speed of the body's metabolism (Panggraita & Soenyoto, 2017). Yoga is very influential in reducing metabolic syndrome or blood sugar, so it can prevent cardiovascular disease (Jin et al., 2006).

The results of research on the INSR gene and SHBG hormone in PCOS patients found no significant differences in the Madurese. Based on this study, it was found that there was no significant difference in the INSR gene between PCOS women and healthy women. In studies in the Madurese tribe, the highest genotype was heterozygous compared to homozygous for the INSR gene (Suhron & Zainiyah, 2021; Zainiyah & Suhron, 2021; Zainiyah, Susanti, & Haris, 2020). This study is the same as our study, which found that there was no significant difference in the genotype and alleles of the INSR gene between the case and control groups. But judging from the relationship of the INSR gene allele with PCOS, it was found that there was a significant relationship with the PCOS group. The results of several studies are consistent with this study, such as studies on Indian women and Chinese women (Dadachanji, Shaikh, & Mukherjee, 2018; Jin et al., 2006). Research on the Madurese is not in line with research on Iranian women, finding that there is a significant relationship between the INSR gene and PCOS (M, F, & A, 2014).

Obese PCOS has insulin resistance and insulin sensitivity but is absent in non-obese PCOS women, findings in non-obese PCOS patients are controversial (Eriksen et al., 2012). Obesity occurs 50-80% in PCOS patients compared to non-obese PCOS. Women with PCOS with a BMI of 0.30 kg/m2 are ten times more likely to have impaired glucose tolerance or diabetes when compared to PCOS women with a BMI of 25 kg/m2, and women with a BMI of 25-30 kg/m2 (Gourgari et al., 2016). Based on the consensus results it was found that obese women with PCOS develop insulin resistance. Conversely, several studies have shown no IR in slim women with PCOS (Reyes-Muñoz et al., 2016). Overweight and obesity, particularly abdominal adipocytes, and insulin resistance are implicated in the pathogenesis of PCOS and as triggering factors for dysregulation of steroidogenesis, in addition to increasing the cardiovascular risk associated with PCOS (O'Connor, Gibney, & Roche, 2010).

The results also found that most PCOS patients experienced moderate and severe stress because they thought they had not had children for a long time, however, after doing yoga, their stress levels decreased, from severe and moderate to normal, mild and moderate. This yoga can be done at home (Battle et al., 2016; Practice, 2017). Yoga is an alternative therapy that has a positive effect on humans. In addition, slow and deep breathing patterns in yoga cause relaxation and make the mind more calm and focused, thereby improving stress and mood conditions. Improving physical abilities and body flexibility also makes a person more confident and independent in taking care of himself. These things help improve the quality of life (Büssing, Michalsen, Khalsa, Telles, & Sherman, 2012). The advantages of yoga compared to other types of exercise include: yoga is static in one position that is maintained for a while, the effects of yoga practice affect many organs or physiological systems, are anabolic, meaning that the movements are in sync with breathing so that the oxygen supply is always sufficient, is subjective thus making yoga practitioners tend to be introverted and self-controlled, calming and clearing the mind.

Yoga exercise as a form of physical exercise that effectively controls blood sugar levels. Yoga is needed to burn excess glucose in the body. This exercise also spurs the body to use carbohydrates more effectively. Yoga done regularly helps weight loss.

CONCLUSION

This research is the first to be conducted in the Madurese by administering Yoga to a decrease in HOMA-IR values and Insulin levels, BB and BMI. The results of the study found that there was a significant difference between before and after giving Yoga exercises.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest

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