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Research Article

ASSESSMENT OF POLYCYSTIC OVARY SYNDROME (PCOS) OCCURRENCES AMONG ADOLESCENT AND YOUNG REPRODUCTIVE AGE GROUP WOMEN IN TIRUCHIRAPPALLI, TAMIL NADU

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ABSTRACT

In this study, the healthy patients of three different age groups - biochemical and hormonal profiles were compared with PCOS patients. The results concluded that BS (Blood Sugar), FSH (Follicle Stimulating Hormone), LH (Luteinizing Hormone), PRL (Prolactin), TSH (Thyroid Stimulating Hormones), T(Testosterone), SHBG (Sex Hormone Binding Globulin), I (Insulin), BS(F) (Blood Sugar Fasting), DHEA-S (Dehydroepiandrosterone- sulphate), Creatinine, Cholesterol, Triglycerides, LDL and were significantly varied in PCOS women than compared to the normal due to the altered metabolism influenced by either GnRH or GnIH from hypothalamus. Among the three age categories, 21-26yrs age group showed significantly varied result. Our study concluded that 21-26yrs women showed increased incidence of PCOS than other reproductive age women. The aim is to reflect the assumed relation based on studies in different stages of life in Women with PCOS.

Keywords: Patients, PCOS, Triglycerides, Hypothalamus, Blood Sugar.

INTRODUCTION

Chereau one who first described sclerostin changes in the human ovary in1844, occasional reports on this condition continued to appear over the years. Steain and Leventhal (1935) described a case of polycystic ovaries as consisting of menstrual irregularity. The Condition was called the Stein-Leventhal Syndrome (Stein and Leventhal, 1935). In 1960s and 1970s, it became possible to measure the hormonal change and some biochemical changes in urine and blood. In the1980s, high- resolution ultrasound was used to study a typical polycystic ovary containing over 10 follicles of diameter between 2 and 10mm.

Polycystic ovarian syndrome is a complex and heterogeneous clinical condition characterized by hyper androgenism and chronic oligo anovulation (Zawadski and Dunaif,1992). In comparison to the normal ovary, the polycystic ovary has multiple small cysts. These cysts appear when frequent disruptions in menstrual cycles occur. The ovary is enlarged and produces excessive amounts of androgen and estrogenic hormones (Richard, 2011). Imbalance of hormones prevents the ovaries from releasing an egg each month. So ovulation does not occur and the ovaries produce more immature eggs. These eggs turn into cysts and the ovaries become large and studded with numerous cysts is called polycystic syndrome (Metab, 1998). Other metabolic disorders like obesity, type2 diabetes and cardiovascular problems can also be included as its features (Xita *et al*., 2002). About 50% of the women are obese particularly abdominal obesity in common, suggesting that elevated androgen levels.

Diagnosis of Polycystic Ovarian Disorder. PCOS is the most common disorder in women of reproductive age group as well as premenopausal women (Janssen *et al*.,2004; Zarger *et al*.,2005). PCOS increased serum concentration of luteinizing hormone (LH), LH/FSH ratio and increase in the amplitude and frequency of LH

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secretion (Mobeen *et al*., 2016).Generally PCOS was Diagnosed by the basis of clinical features of the menstrual dysfunction, obesity, infertility and the direct visualization of the ovaries at the laparotomy but in the NIH conference agreed that biochemical markers like the LH/FSH ratio, increased testosterone hormone levels in the blood is also a diagnostic criteria for PCOS (Zawadzki and Dunaif, 1992).Other metabolic disorders like obesity, type2 diabetes and cardiovascular problems can also be included as its features (Xita*et al*., 2002). About 50% of the women are obese particularly abdominal obesity in common, suggesting that elevated androgen levels. The PCOS is not only based on reproductive health issue but the metabolic and the cardio vascular issue are also raised (King., 2006).

Risk Factors of PCOS

Cardiovascular Disease, Obesity, Infertility, Endometrial Cancer, Complications in Pregnancy, Sleep Apnoea, Depression.

MATERIALS AND METHODS

Patient details

The 357 female patients who visited the Reproductive Medical Centre at Ramakrishna Hospital, Woraiyur, Tiruchirappalli-620 003. Between May 2018 to September 2020 the data was collected and their sample size were shown in the Table 1. The patients were categorized according to their Age group. Group1 is age between 15 to 20, Group 2 is age between 21to 25, Group 3 is age between 26 to 30 and Group 4 is age between 31 to 35.

Table 1. Age and Year Cross tabulation of No. of patients with PCOS.

Age	Year			Total
	2018	2019	2020	
15-20 yrs.	20	35	10	65
21-25 yrs.	70	57	29	156
26-30 yrs.	33	39	26	98
31-35 yrs.	9	20	9	38
Total	132	151	74	357

Clinical Detection

Clinical feature were recorded and variables such as age, *BS (Blood Sugar),* FSH (Follicle Stimulating Hormone), *LH (Luteinizing Hormone), *PRL (Prolactin), *TSH (Thyroid Stimulating Hormones), *T(Testosterone), *SHBG (Sex Hormone Binding Globulin), I (Insulin),*BS(F) (Blood Sugar Fasting), *DHEA-S (Dehydroepiandrosterone- sulphate),*E2(Estradiol), *BU (Blood Urea), *Creatinine, * Cholesterol, * Triglycerides, * HDL(High Density Lipoprotein), * LDL and VLDL (Very Low Density Cholesterol). These parameters were analysed to each patient by standard procedures in the hospital and results were procured and compared with normal age range values to find out the abnormal patients.

Statistical Analysis

The statistical analysis was performed using the Microsoft excel version 2013. The base work has been stated as grouping patients according to their age wise and plotted graph with various parameters to find which age group patients are more affected by PCOS. In addition to that using Statistical Package for the Social Sciences for Window version 20.0 (SPSS), I have been calculated Mean, Median, Standard Error of Mean, Minimum, Maximum and Standard Deviation.

RESULTS AND DISCUSSION

Three consecutive years patient blood glucose levels between normal and diabetes results based on different age groups. In all the three years, high number of diabetic patients are under the 21-25 yrs., Table 2. Polycystic ovary syndrome (PCOS) is an endocrine disorder characterized by anovulation, menstrual disorder. It is also known as stein levinthal syndrome1-3. Women with PCOS have impaired metabolism of androgen, estrogen and also in the control of androgen production. PCOS is the most common disorder in women of reproductive age group as well as premenopausal women (Janssen *et al*., 2004 and Zarger*et al*., 2005). Biochemical features of PCOS include elevated androgens, particularly testosterone, luteinizing hormone (LH), Estrogen, insulin levels and decreased sex-hormone binding globulin (SHBG) levels (Tsilchorozidu, 2004).

Table 2. Age wise variation in the mean level of blood glucose in the PCOS patients from 2018-2020.

Year	Age	Blood glucose (mg/dl)		Total
		Normal	Diabetic patient	
2018	15-20yrs	16	4	20
	21-25yrs	50	20	70
	26-30yrs	15	18	33
	31-35yrs	6	3	9
	Total	87	45	132
2019	15-20yrs	27	8	35
	21-25yrs	44	13	57
	26-30yrs	21	18	39
	31-35yrs	9	11	20
	Total	101	50	151
2020	15-20yrs	7	3	10
	21-25yrs	16	13	29
	26-30yrs	16	10	26
	31-35yrs	7	2	9
	Total	46	28	74

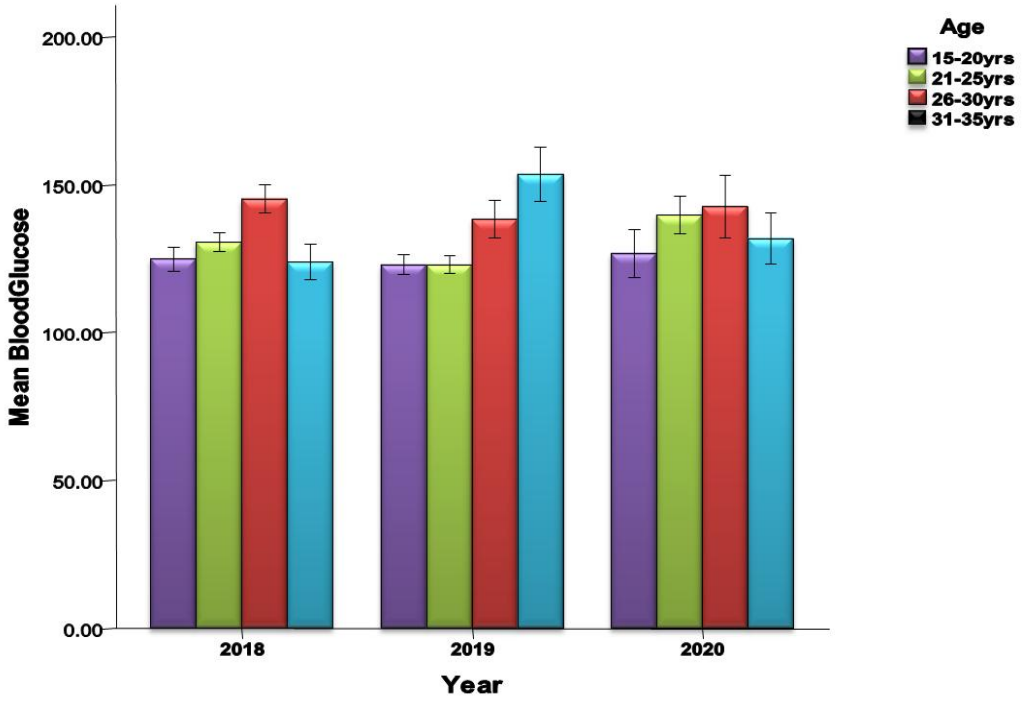

Figure 1. Mean and SE of blood glucose level in patients with PCOS from 2018-2020.

Table 3. Age wise variation in the mean level of BSF in the PCOS patients from 2018-2020.

Year	Age	BSF(mg/dl)		Total
		Normal Level	Affected level	
2018	15-20yrs	20	0	20
	21-25yrs	67	3	70
	26-30yrs	26	7	33
	31-35yrs	9	0	9
	Total	122	10	132
2019	15-20yrs	32	3	35
	21-25yrs	54	3	57
	26-30yrs	36	3	39
	31-35yrs	16	4	20
	Total	138	13	151
2020	15-20yrs	10	0	10
	21-25yrs	28	1	29
	26-30yrs	22	4	26
	31-35yrs	7	2	9
	Total	67	7	74

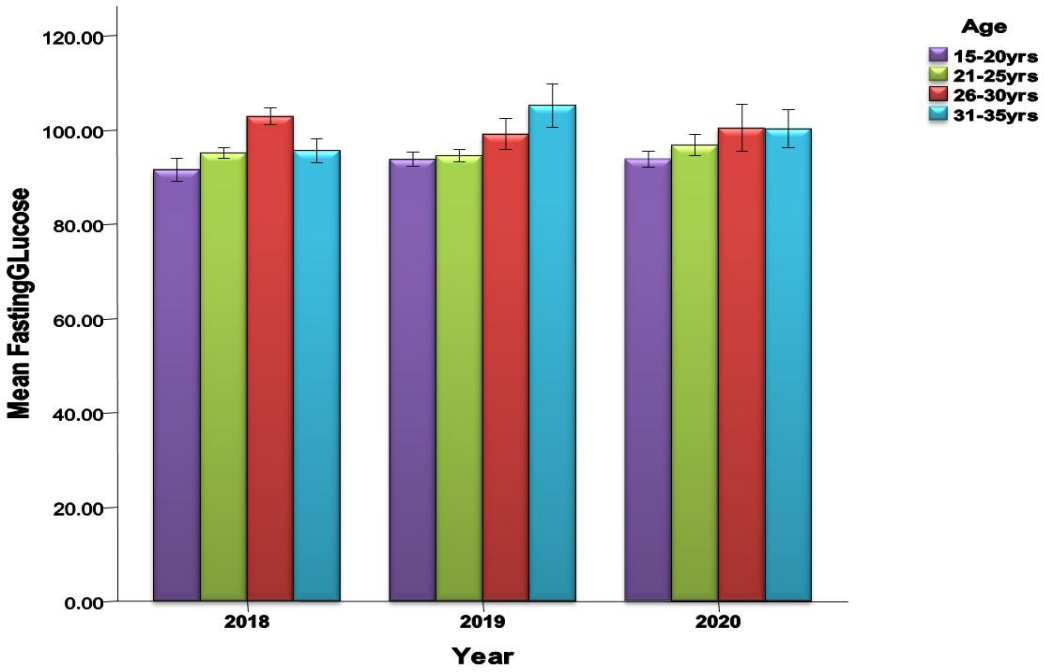

Figure 2. Mean and SE of Fasting Glucose levels in PCOS patients from 2018-2020.

Table 4. Mean and SE of blood glucose level in patients with PCOS from 2018-2020.

Year	Age	FSH (ng/dl)		Total
		Normal Level	Affected level	
2018	15-20yrs	20	0	20
	21-25yrs	69	1	70
	26-30yrs	33	0	33
	31-35yrs	9	0	9
	Total	131	1	132
2019	15-20yrs	35	0	35
	21-25yrs	55	2	57
	26-30yrs	39	0	39
	31-35yrs	19	1	20
	Total	148	3	151
2020	15-20yrs	9	1	10
	21-25yrs	28	1	29
	26-30yrs	26	0	26
	31-35yrs	9	0	9
	Total	72	2	74

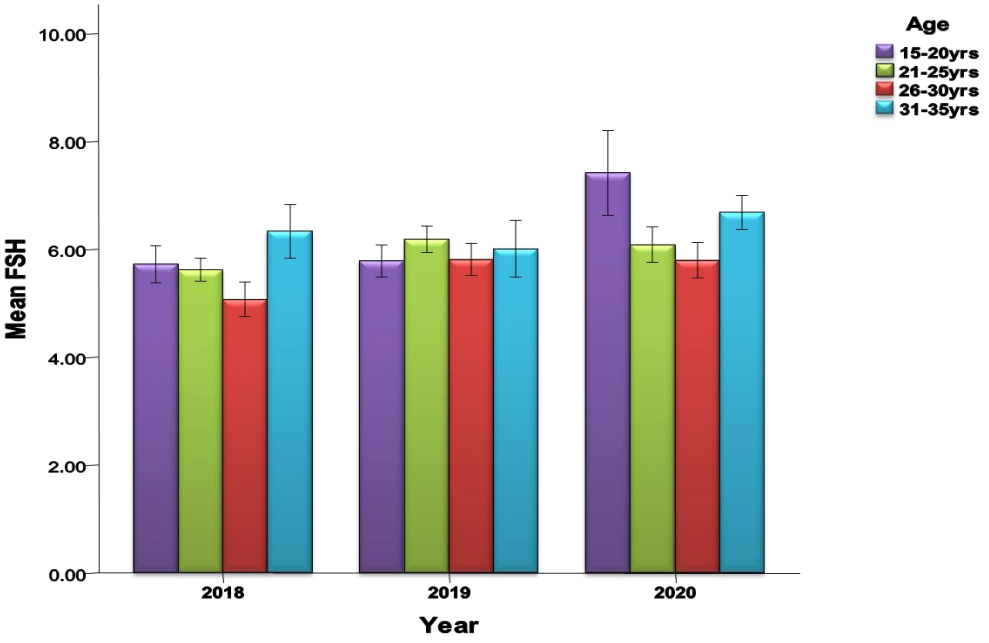

Figure 3. Mean and SE of FSH level in patients with PCOS from 2018-2020.

Table 5. Mean and SE of LH level in patients with PCOS from 2018-2020.

Year	Age	LH (ng/dl)		Total
		Normal Level	Affected level	
2018	15-20yrs	18	2	20
	21-25yrs	65	5	70
	26-30yrs	33	0	33
	31-35yrs	9	0	9
	Total	125	7	132
2019	15-20yrs	32	3	35
	21-25yrs	52	5	57
	26-30yrs	37	2	39
	31-35yrs	20	0	20
	Total	141	10	151
2020	15-20yrs	9	1	10
	21-25yrs	27	2	29
	26-30yrs	24	2	26
	31-35yrs	8	1	9
	Total	68	6	74

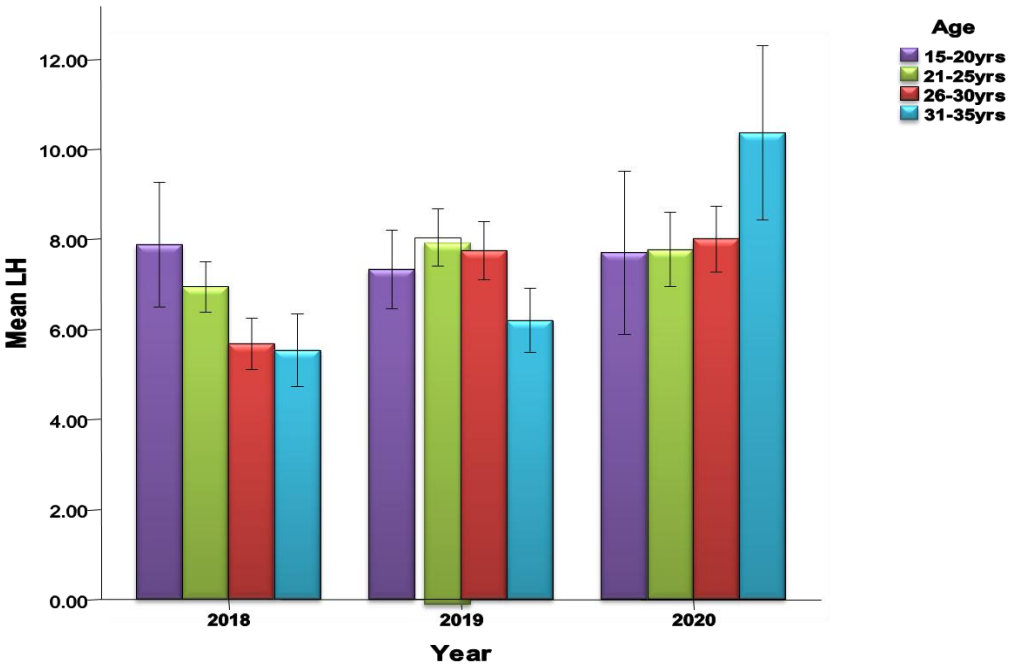

Figure 4. Mean and SE of LH level in patients with PCOS from 2018-2020.

Table 6. Mean and SE of PRL level in patients with PCOS from 2018-2020.

Year	Age	PRL (ng/dl)		Total
		Normal Level	Affected level	
2018	15-20yrs	18	2	20
	21-25yrs	65	5	70
	26-30yrs	32	1	33
	31-35yrs	8	1	9
	Total	123	9	132
2019	15-20yrs	30	5	35
	21-25yrs	50	7	57
	26-30yrs	35	4	39
	31-35yrs	18	2	20
	Total	133	18	151
2020	15-20yrs	8	2	10
	21-25yrs	23	6	29
	26-30yrs	25	1	26
	31-35yrs	9	0	9
	Total	65	9	74

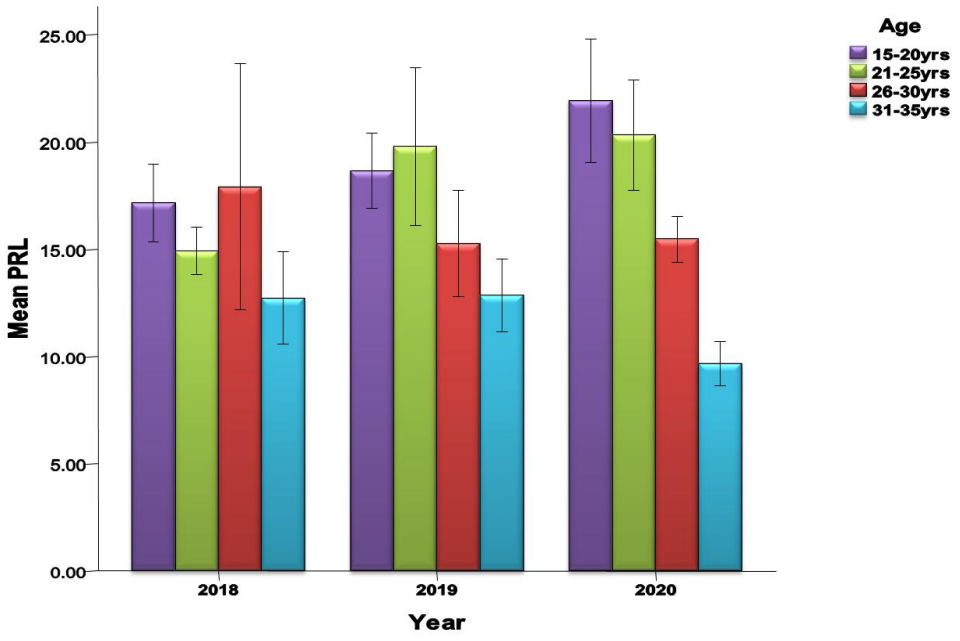

Figure 5. Mean and SE of LH level in patients with PCOS from 2018-2020.

These biochemical levels are extremely important because SHBG normally binds to testosterone to transport it throughout the body, and while some testosterone is needed in women, too much free or unbound testosterone leads to many problems such as the male-patterned hair loss seen in many PCOS patients. Insulin directly stimulates the cells to produce androgens, and elevated levels of androgens are related to many of the problems or symptoms seen in PCOS. Insulin also causes a decrease in the production of hepatic Sex Hormone Binding Globulin (SHBG) (Moran *et al*., 2003). Meals should be balanced in order for your body to carry out the optimum insulin secretion and metabolism by eating foods that will cause a slower rise in blood sugar level, and prevent large peaks and valleys in insulin and glucose levels. These results point to the conclusion that energy restriction is what really matters in relations to diets for PCOS patients.

CONCLUSION

Hence, I conclude that there are still many questions about PCOS that remain unanswered. However, certain studies are looking into many questions about PCOS. Some researchers are proposing possible causes; others are trying to determine which diet and exercise regimen is best; while others are exploring the avenues of education, prevention, and associated disorders. Regardless of the current state of information, it can be said that there will be a brighter future for patient with PCOS.

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CONFLICT OF INTERESTS

The authors declare no conflict of interest

ETHICS APPROVAL

Not applicable

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AI TOOL DECLARATION

The authors declares that no AI and related tools are used to write the scientific content of this manuscript.

DATA AVAILABILITY

Data will be available on request

REFERENCES

Allahbadia, G. N., & Merchant, R. (2008). Polycystic ovary syndrome in the Indian subcontinent. *Seminars in Reproductive Medicine, 26*(1), 22-34.

Duleba, A. J., & Ahamed, I. M. (2010). Predictors of urinary albumin excretion in women with polycystic ovary syndrome. *Fertility and Sterility, 93*(7), 2285-2290.

Asunción, M., Calvo, R. M., San Millán, J. L., et al. (2000). A prospective study of the prevalence of the polycystic ovary syndrome in unselected Caucasian women from Spain. *Journal of Clinical Endocrinology & Metabolism, 85*(7), 2434-2438.

Azziz, R., Marin, C., Hoq, L., Badamgarav, E., & Song, P. (2005). Health care–related economic burden of the polycystic ovary syndrome during the reproductive life span. *Journal of Clinical Endocrinology & Metabolism, 90*(8), 4650-4658.

Balen, A. (2004). The pathophysiology of polycystic ovary syndrome: Trying to understand PCOS and its endocrinology. *Best Practice & Research Clinical Obstetrics & Gynaecology, 18*(5), 685-706.

Boomsma, C. M., Eijkemans, M. J., Hughes, E. G., Visser, G. H., Fauser, B. C., & Macklon, N. S. (2006). A meta-analysis of pregnancy outcomes in women with polycystic ovary syndrome. *Human Reproduction Update, 12*(6), 673-683.

Broekmans, F. J., Knauff, E. A., Valkenburg, O., Laven, J. S., Eijkemans, M. J., & Fauser, B. C. (2006). PCOS according to the Rotterdam consensus criteria: Change in prevalence among WHO-II anovulation and association with metabolic factors. *BJOG: An International Journal of Obstetrics & Gynaecology, 113*(10), 1210-1217.

Chen, X., Yang, D., Mo, Y., et al. (2008). Prevalence of polycystic ovary syndrome in unselected women from southern China. *European Journal of Obstetrics & Gynecology and Reproductive Biology, 139*(1), 59-65.

Connolly, F., Rae, M. T., Spath, K., Boswell, L., McNeilly, A. S., & Duncan, W. C. (2015). In an ovine model of polycystic ovary syndrome (PCOS), prenatal androgens suppress female renal gluconeogenesis. *PLOS ONE, 10*(7), e0132113.

Garad, R., Teede, H. J., & Moran, L. (2011). An evidence-based guideline for polycystic ovary syndrome. *Australian Nursing Journal, 19*(4), 30-34.

Goverde, A. J., van Koert, A. J., Eijkemans, M. J., et al. (2009). Indicators for metabolic disturbances in consensus criteria. *Human Reproduction, 24*(3), 710-717.

Hassa, H., Tanir, M., & Yildiz, B. (2006). Comparison of clinical and laboratory characteristics of cases with polycystic ovary syndrome based on Rotterdam's criteria and women whose only clinical signs are oligo/anovulation or hirsutism. *Archives of Gynecology and Obstetrics, 274*(4), 227-232.

Hart, R., & Norman, R. (2006). Polycystic ovarian syndrome: Progenesis and outcomes. *Best Practice & Research Clinical Obstetrics & Gynaecology, 20*(5), 751-778.

Kashar-Miller, M. D., Nixon, C., Boots, L. R., Go, R. C., & Azziz, R. (2001). Prevalence of polycystic ovary syndrome (PCOS) in first-degree relatives of patients with PCOS. *Fertility and Sterility, 75*(1), 53-58.

King, J. (2006). Polycystic ovary syndrome. *Journal of Midwifery & Women's Health, 51*(6), 415-422.

Katulski, K., Czyzyk, A., Podkowa, N., Podfigurna, A., Ignaszak, N., Paczkowska, K., Slawek, S., Spzurek, D., & Meczekalski, B. (2017). Clinical and hormonal features of women with polycystic ovary syndrome living in rural and urban areas. *Annals of Agricultural and Environmental Medicine, 24*(3), 522-526.

Legro, R. S., Castracane, V. D., & Kauffman, R. P. (2004). Detecting insulin resistance in polycystic ovary syndrome: Purposes and pitfalls. *Obstetrical & Gynecological Survey, 59*(2), 141-154.