

# TRANSVAGINAL HYDROLAPAROSCOPY- NEW METHOD FOR INFERTILE PATIENTS WITH POLYCYSTIC OVARY SYNDROME

M.A. MOGA<sup>1</sup> M. GRECU<sup>1</sup> C. ANASTASIU<sup>1</sup>  
A. MIRONESCU<sup>1</sup> C. GAVRIS<sup>1</sup> C. ARVATESCU<sup>1</sup>

**Abstract:** *Polycystic ovary syndrome is an accumulation of endocrine changes that associates oligo-amenorrhea, obesity, hirsutism, androgen excess and resistance to insulin. Ovarian drilling can be done through classical laparoscopy and by transvaginal hydrolaparoscopy - minimally invasive surgical method. We performed a meta-analysis of eight studies conducted between 2003-2011, which include a total of 350 infertile patients undergo transvaginal hydrolaparoscopy. Reviewed studies have demonstrated a 49.1% rate of pregnancy after getting a transvaginal hydrolaparoscopy similar to pregnancy rate after laparoscopic ovarian drilling- 58.5%. In conclusion, we can say that transvaginal hydrolaparoscopy is a new method of diagnosis and treatment for infertile patients with micro polycystic ovary syndrome.*

**Key words:** *transvaginal hydrolaparoscopy, laparoscopy, polycystic ovary syndrome, ovarian drilling.*

## 1. Introduction

Infertility is defined as the absence of pregnancy after one year of unprotected sexual contact and affects approximately 15% of couples of childbearing ages [2,4]. The main causes of infertility are male factor, ovulatory dysfunction or mechanical factors (most frequently the tube and rarely the uterus). Oligoanovulation is present in PCOS (polycystic ovary syndrome) as well as in ovarian dystrophies. Polycystic ovary syndrome represents an accumulation of endocrine changes that associates oligo-

amenorrhea, obesity, hirsutism, androgen excess and resistance to insulin [2].

Ovary resection was the first method described in the treatment of PCOS, but was abandoned due to the risk of developing pelvic adhesions. This type of intervention has been replaced by induction of ovulation with clomiphene and gonadotropins. Despite its effectiveness, treatment with gonadotropins has its complications, which could lead to the development of ovarian hyper stimulation syndrome or multiple pregnancies. The method is also cost ineffective, time consuming and requires

---

<sup>1</sup> Faculty of Medicine, *Transilvania* University of Braşov.

\* Correspondent author: claudia.gavris@unitbv.ro

intensive monitoring. Laparoscopic surgery, consisting in ovarian drilling may avoid, reduce or facilitate the action of gonadotropins and improve the induction of ovulation [28]. Ovarian drilling can be done through conventional laparoscopy and by transvaginal hydrolaparoscopy - minimally invasive surgical method.

## 2. Objective of the study

The purpose of this study is to analyze the advantages and disadvantages of minimally invasive approach to female genital tract, namely, the transvaginal hydrolaparoscopy, for micro polycystic ovary syndrome treatment and also the rate evaluation of obtaining a pregnancy after transvaginal hydrolaparoscopy.

## 3. Material and method

We performed a systematic review of eight studies conducted between 2003-2011 and we include in this review a total of 350 infertile patients that underwent transvaginal hydrolaparoscopy. The studies were conducted in different countries (Japan, USA, China, Iran, Italy, France, Belgium).

## 3. Results

The reviewed studies demonstrated a 49.1% rate of pregnancy after a transvaginal hydrolaparoscopy similar to pregnancy rate after laparoscopic ovarian drilling (58.5%), resulting in Campo study.

*Overview of the studies that evaluate the pregnancy rate after THL* Table 1

Authors	Year	Patients number with THL	Pregnancy rate after THL
Casa [6]	2003	28	46,4%
Fujiwara [11]	2003	36	55,5%
Moore [26]	2003	97	24%
Elkelani [9]	2005	30	83%
Ghasemzad [12]	2007	30	26,7%
Gordts [19]	2009	33	76%
Poujade [31]	2011	74	63%
Yang [40]	2011	22	18,2%
		<b>n = 350</b>	<b>49,1%</b>

Other recent studies published since 2005 regarding access and complications of transvaginal hydrolaparoscopy are

shown in Table 2. The results confirm the safety of the surgical technique.

*Overview of the studies regarding the complications of THL*

Table 2

Authors	Year	Cases	Access	Abnormality	Complications
Hu [20]	2005	110	95,7%	NR	0
Tanos [35]	2005	78	70-100%	49%	1 bleeding
El- Shalakany [10]	2006	22	95,5%	54%	0
Kowalczyk [24]	2006	56	100%	57,2%	1 bowel injury
Van Tetering [39]	2007	272	96%	56%	2 rectum injuries 2 bleedings 1 suspectes PID
Sobek [34]	2008	562	100%	30,5%	0
Ahinko- Hakamma et al [1]	2009	56	91%	NR	0

Authors	Year	Cases	Access	Abnormality	Complications
Pjevic [29]	2010	400	96%	47,5%	0
Kissler [23]	2011	239	99%	33,5%	0
Yang [40]	2011	51	96%	47,9%	0

#### 4. Discussions

PCOS is a common endocrine disorder, complex and heterogeneous, defined by a spectrum of clinical, hormonal and anatomical factors of variable intensity and combination. PCOS is classically characterized by ovarian dysfunction (oligomenorrhea, anovulatory infertility), androgen excess (hirsutism, acne) and morphological abnormalities ovary (polycystic aspect by ultrasound). An important component of PCOS is the hypersecretion of insulin with varying degrees of insulin resistance. The mechanisms involved can be explained by the presence of antibodies antireceptor of insulin. It has been identified receptors for insulin and IGF1 on the ovary and their stimulation sensitizes ovary stimulation with gonadotrophins, thus increasing the level of androgens. Also, hypersecretion of insulin inhibits the secretion of hepatic SHBG which, especially in obese patients, can lead to an apparent mismatch between circulating testosterone concentration and degree of hirsutism, explained by increasing free testosterone in order to maintain the total level of testosterone in the normal range [21].

It has been shown that obese women with PCOS, compared to healthy women presents vary degree of insulin resistance and compensatory hyperinsulinemia which are known today as common features of the syndrome. Many genes that coordinate secretion and insulin action were explored as candidate genes in the pathogenesis of PCOS (genes and insulin gene, gene insulin receptor, protein substrate of the insulin receptor, Calpain 10 gene or

Peroxisome proliferator-activated receptor - $\gamma$  gene) [14].

The incidence of ovulation is negatively correlated with the ratio waist/ hip, abdominal circumference and visceral fat ultrasound quantification. Thus, it can support a direct influence on the obesity, especially in the distribution of the android type on the inhibition of ovulation in patients with PCOS [30].

Approach treatment for infertility in PCOS can sometimes be difficult. It is known that the first line of treatment would be the administration of anti-estrogenic therapy, but while clomiphene citrate can induce ovulation in more than 80% of the women treated, pregnancy rate obtained after 6 months of therapy is only 40%. PCOS treatment option for patients resistant to clomiphene citrate is the administration of gonadotropins. Treatment with GHRH analogues in this group offers a cumulative pregnancy rate of 70% after 4-6 cycles of therapy, but is associated with an increased risk of developing severe ovarian hyper stimulation syndrome or multiple pregnancies.

Over the time, ovarian resection has been replaced by laparoscopic drilling ovarian as surgical therapy for patients with PCOS resistant to treatment with clomiphene citrate. Advantages of the method include increased ovulation rate and decreased complication rates following treatment with gonadotropins [3].

Since *Gordts and collaborators* introduced the technique of transvaginal hydrolaparoscopy for the investigation of infertile patients, interest to the vaginal approach for exploring the genital tract has increased [15], [16].

### *Transvaginal hydrolaparoscopy*

Transvaginal hydrolaparoscopy is today accepted as a feasible technique for investigating and treating infertility and has the capacity to predict the rate of spontaneous ongoing pregnancy comparable to that of achieved by conventional laparoscopy. The technique uses saline as a distension medium and may be carried out in ambulatory system with intravenous sedation or local anesthesia [15]. Exploring the female genital tract should be as easy as hysterosalpingography and as accurate as conventional laparoscopy. Transvaginal laparoscopy offers the most efficient and accurate solution for this problem. The challenge is: to identify a low cost and easily accessible diagnostic procedure with operative possibilities, in order to offer the fastest and minimal invasive lane to pregnancy [5]. Transvaginal hydrolaparoscopy is an alternative method to hysterosalpingography and laparoscopy, that allows direct visualization of the peritoneal cavity in women [27].

### *Indications and contraindications* [33]

There are 5 major indications:

1. tubal obstruction and/or peri tubal adhesions suggested by hysterosalpingography
2. serum antibody against C. trachomatis positive
3. diagnosis of early stage of endometriosis
4. unexplained infertility
5. operative transvaginal laparoscopy - ovarian drilling in infertile women with polycystic ovary syndrome.

The contraindications are:

1. Retroflexed uterus
2. History of pelvic surgery
3. Obstruction of the pouch of Douglas by the rectum or prolapsed tumor
4. Acute pelvic inflammatory disease

*Operative technique* [15], [16]

The operative technique is simple, with the patient in the dorsal decubitus position under local anesthesia or intravenous sedation, the transvaginal laparoscopy can be performed using a simple puncture technique of the pouch of Douglas. It used saline solution as distension.

To allow a safe and atraumatic entrance into the pouch of Douglas is needed a trocar system. The needle length can be preset between 10 and 25 mm. Typically the length of the needle is set to 15 mm, and the length of the needle set to 25 mm only in obese patients. A 2.9 mm endoscope with a 30° angle lens and a diagnostic sheath of 3.7 mm is used both for hysteroscopy and transvaginal laparoscopy (TVL). Before use, the needle is passed into the dilating sheath. The unit is then inserted in the outer trocar and fixed with a counterclockwise movement. In case it is indicated, this diagnostic trocar can be exchanged for another trocar with a working channel allowing the insertion of a 5 Fr grasping or biopsy forceps and scissors.

Changing from the diagnostic device to the trocar with the working channel is performed using a guide mandrin. A light source, preferable a xenon light source, is necessary for illumination of the pelvic space. The vaginal speculum has to have two open lateral sides, (Collin speculum), so it can be removed from the vagina soon after the placement of the other trocar sheath. The trocar assembled is placed in the back of the posterior vaginal bag in the midline, about 1.5 cm below the cervix, following the longitudinal vaginal axis.

In this way, it can be performed the puncture of the pouch of Douglas, between utero-sacral ligaments [8], [25].

### *Operative transvaginal laparoscopy* [16,17]

The TVL is also very suitable for performing drilling of the ovarian capsule

in patients with polycystic ovary syndrome (PCOS) resistant to medical therapy. One of the major concerns of laparoscopic drilling of the ovaries was the risk of postoperative adhesion formation.

After identification of the ovarian surface, drilling of the ovarian capsule is performed using a bipolar needle with a diameter of 1 mm and a length of 0.8 cm. The needle is placed perpendicular to the ovarian surface and is gently pushed against the ovarian surface. The capsule is perforated using a bipolar cutting current, allowing an easy insertion of the needle. A coagulating current is used for 5 seconds, followed by the removal of the needle. It can be made about 10–15 small holes on each ovarian surface, preferentially on the anterolateral site. When the current is switched on, the continuous flow of Ringer's lactate is stopped, allowing a more accurate performance of the bipolar. The small needle diameter minimizes the defect on the ovarian capsule and, in the absence of carbonization in a watery environment, risks for postoperative adhesion formation will be reduced.

At this moment, laparoscopy procedure is considered to be the "gold standard" technique for the diagnosis of tubal pathology. However, it is an invasive laparoscopic surgery that requires general anesthesia [37]. Transvaginal hydrolaparoscopy was first described by *Gords et al.* in 1998. It is derived from culdoscopy, an rarely used method, especially from when it was demonstrated the superiority of laparoscopy [7]. One of the cardinal reasons for that culdoscopy was abandoned in favor of laparoscopy was that transvaginal access that can lead to rectal perforation and sepsis development. But bowel perforation is a complication of laparoscopy too [16], [17].

THL is a less traumatic and can be performed in outpatient system. Transvaginal access and the systemic use

of hydro flotation represents the advantages of transvaginal laparoscopy. Moreover, inspection under fluid improves the visualization of distal tubal structures. The risks of a general anesthesia are avoided and there is little chance of injury to major vessels [22]. To expose the full ovarian surface several steps are required: Trendelenburg position, distension by CO<sub>2</sub> peritoneum, a second trocar insertion and manipulation of bowel and adnexa.

THL benefits include accurate and atraumatic inspection of the structure of adnexal [32]. *Tanos et al.* [35] have been demonstrated in a study conducted in three Mediterranean countries (Italy, Greece, Cyprus) that transvaginal hydrolaparoscopy is a feasible method of investigation, with accurate results and easy to learn. Post-operative complications and risks are minimal and depends on the experience of the surgeon, and the patient's selection, as showed in Table 2.

Pelvic adhesions represent a postoperative complication in women diagnosed with polycystic ovary syndrome, and laparoscopy can create a vicious circle by leading to infertility. In the formation of peritoneal adhesions, two factors play a crucial role: high susceptibility to trauma of the peritoneal surface and the speed of recoding the mesothelium areas (5-8 days) [36].

*Giampaolino et al.* conducted a randomized trial to University of Naples "Federico II", Department of Obstetrics and Gynecology, between December 2009 and July 2015 on 286 patients diagnosed with PCOS resistant to clomiphene citrate therapy included in the study. The inclusion criteria were age 18-40 years, respectively compliance to the Rotterdam criteria [38] which include oligo- and/or anovulation, clinical signs and/or biochemical hypoandrogenism, micro polycystic ovaries and exclusion of other etiologies such as: congenital adrenal

hyperplasia, androgen-secreting tumors and Cushing's syndrome. 246 of 286 patients included in the study, met the inclusion criteria and were divided into two equal groups, each group being subjected to laparoscopic ovarian drilling surgery, respectively transvaginal hydrolaparoscopy. Of these, 73 patients who underwent laparoscopy developed adhesions compared to 15 patients who underwent hydrolaparoscopy [13].

### 5. Conclusions

Transvaginal laparoscopy is a new method of diagnosis and treatment for infertile patients with polycystic ovary syndrome, a method less traumatic, with risks and complications less than classical laparoscopy, and the rate of obtaining a pregnancy similar for both methods.

### References

1. Akinko-Hakamma, K. M., Huhtala, H., et al. : *Confirmation of tubal patency in hysterosalpingo-contrast sonography by transvaginal hydrolaparoscopy*. In: Acta Obstet Gynecol Scand, 2009, Volume 26, Issue 3, p. 1-5
2. Anghelescu, I., Coricovac, A., et al.: *Factorii de mediu și infertilitatea- aspecte particulare în populația română [Environmental factors and infertility – particular aspects in Romanian population]*. In: Acta Medica Transilvanica, 2014, Vol. 2, Issue 2, p. 9.
3. Anerraretti, A., Gianaroli, L., et al.: *Transvaginal ovarian drilling: a new surgical treatment for improving the clinical outcome of assisted reproductive technologies in patients with polycystic ovary syndrome*. In: Fertility and sterility, 2001, Vol. 76, Issue 4, p. 812-816.
4. Atasie, D.: *Cauzele sterilității feminine și masculine [The causes of male and female infertility]*. In: Acta Medica Transilvanica, Volume 2, Issue 3, 2008, p. 82.
5. Campo, R., Molinas, C. R.: *Modern endoscopic-based exploration of the female reproductive tract: a model for developing countries?* In: Human Reproduction, 2008, Vol. 1, Issue 1, p. 54-59.
6. Casa, A., Sesti, F., et al.: *Transvaginal Hydrolaparoscopic Ovarian Drilling Using Bipolar Electrosurgery to Treat Anovulatory Women with Polycystic Ovary Syndrome*. In: The Journal of the American Association of Gynecologic Laparoscopists 2003, Volume 10, Issue 2, p. 219-222.
7. Darai, E., Dessole L., et al.: *Transvaginal hydrolaparoscopy compared with laparoscopy for the evaluation of infertile women: a prospective comparative blind study*. In: Human Reproduction, 2000, Volume 15, Issue 11, p. 2379-2382.
8. De Wilde, R. L., Brosens, I.: *Rationale of first- line endoscopy- based fertility exploration using transvaginal hydrolaparoscopy and mini-hysteroscopy*. In: Human Reproduction, 2012, Vol. 27, Issue 8, p. 2247–2253.
9. Elkelani, O.: *Controlled transvaginal minilaparoscopic ovarian drilling in PCOS patients*, In: Cell Journal, 2005, Vol. 7, Supplement 1, p. 21.
10. El-Shalakany, A., Ismaeel, A. -M., et al.: *Transvaginal hydrolaparoscopy: an advance or a gimmick!*. In: Middle East Fertil Soc J, 2006, Volume 11, Issue 1, p. 53–58.
11. Fujiwara, H., Shibahara, H., et al.: *Usefulness and prognostic value of transvaginal hydrolaparoscopy in infertile women*. In: Fertility and Sterility, 2003, Vol. 79, p. 186-189.

12. Ghasemzad, A., Farzadi, L., et al.: *Transvaginal Ovarian Drilling in Infertile Women with Polycystic Ovary Syndrome Resistant to Minimal Stimulation*, In: *J. Med.* 2007, Vol. 7, Issue 6, p. 991-996.
13. Giampaolino, P., Morra, I.: *Post-operative ovarian adhesion formation after ovarian drilling: a randomized study comparing conventional laparoscopy and transvaginal hydrolaparoscopy*. In: *Arch Gynecol Obstet.* 2016, Volume 294, Issue 4, p. 791-796.
14. Gliga, F. I., Buicu, F.: *Sindromul ovarelor polichistice- gene candidate implicate în insulino rezistență [polycystic ovary syndrome – gene involved in insulin resistance]*. In: *Acta medica transilvanica*, 2012, Vol. 2, Issue 3, p. 113-117.
15. Gordts, S., Campo, R.: *Transvaginal access: a safe technique for tubo-ovarian exploration in infertility? Review of the literature*. In: *Gynecol Surg*, 2008, Vol. 5, Issue 3, p. 187–191.
16. Gordts, S., Campo, R., *Investigation of the infertile couple. A one-stop outpatient endoscopy-based approach*. In: *Human Reproduction*, 2002, Vol. 17, Issue 7, p. 1684- 1687.
17. Gordts, S., Campo, R.: *Transvaginal hydrolaparoscopy as an outpatient procedure for infertility*. In: *Human Reproduction*, 1998, Volume 13, Issue 1, p. 99–103.
18. Gordts, S., Campo, R.: *Atlas of transvaginal endoscopy*. In: Informa UK Ltd, 2007, p. 25-29, 85-86.
19. Gordts, S., Gordts, S.: *Transvaginal hydrolaparoscopy in the treatment of polycystic ovary syndrome*. In: *Fertility and Sterility* 2009, Vol.91, Issue 6, p. 2520-2526.
20. Hu, X. L., Xu, H. L. : *Study on combined transvaginal hydro-laparoscopy and hysteroscopy in patients with infertility*. In: *Zhonghua Fu Chan Ke Za Zhi*, 2004, Vol. 39, Issue 8, p. 508–510.
21. Iconaru, L., Hristea, R.: *Argumente în favoarea asocierii tulburărilor metabolice în sindromul de ovare polichistice (SOPC)*, In: *Craiova Medicală*, 2007, Vol. 9, Issue 2, p. 121-123.
22. Kataoka, A., Hirakawa, S.: *Transvaginal Hidrolaparoscopy by Flexible Fiberscope –Astudy of Preliminary Cases*. In: *Kurume Medical Journal*, 2011, Vol. 58, Issue 4, p. 99-103.
23. Kissler, S., Marx, K., et al.: *Predisposition of subtle endometriotic lesions predominantly on the left side assessed by transvaginal hydrolaparoscopy (THL)*. In: *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 2011, Vol. 158, Issue 2, p. 285-288.
24. Kowalczyk, D., Guzikowski, W.: *Transvaginal hydrolaparoscopy (THL) in diagnosing infertility*. In: *Ceska Gynekol*, Vol. 71, Issue 5, p. 408–410
25. Mgaloblishvili, I., Osidze, K.: *Complex one-stop investigation of infertility: transvaginal hydro-laparoscopy*. In: *Gynecol Surg*, 2007, Volume 4, Issue 2, p. 79–83.
26. Moore, M. L., Cohen, M.: *Experience with 109 Cases of Transvaginal Hydrolaparoscopy*. In: *The Journal of the American Association of Gynecologic Laparoscopists*, 2003, Vol. 10, Issue 2, p. 282-285.
27. Nadaobi, B. S., Phelps, J.: *Transvaginal Hydrolaparoscopy*. In: *Journal of the Society of Laparoendoscopic Surgeons*. 2012, Volume 16, p. 461–465.
28. Onofriescu, A., Nemescu, D.: *Laparoscopic ovarian drilling for polycystic ovarian syndrome*. In: *TMJ* 2012, Vol. 62, Issue 1-2, p. 41-44.

29. Pjevic, A. T., Kopitovic, V., et al.: *Comparison of a standard and a "one day diagnostic" approach to the investigation of infertile couples*. In: HealthMED, 2012, Volume 6, Issue 4, p. 1296.
30. Popescu, D., Totoianu, I. G.: *Influenţele obezităţii în infertilitatea din sindromul ovarelor polichistice [Obesity influence in infertility caused by polycystic ovary syndrome]*. In: *Acta Medica Transilvanica*, 2008, Vol. 2, Issue 1, p. 98-101.
31. Poujade, O., Gervise, A.: *Surgical management of infertility due to polycystic ovarian syndrome after failure of medical management*. In: *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 2011, Vol. 158, Issue 2, p. 242-247.
32. Shibahara, H., Fujiwara, H.: *Usefulness of transvaginal hydrolaparoscopy in investigating infertile women with Chlamydia Trachomatis infection*. In: *Human Reproduction*, 2001, Vol. 16, Issue 8, p. 1690-1693.
33. Shibahara, H., Suzuki, T.: *Diagnostic and Therapeutic Transvaginal Hydrolaparoscopy, Advanced Gynecologic Endoscopy*. Dr. Atef Darwish (Ed.), 2011. In: Tech. Available at: <http://www.intechopen.com/books/advanced-gynecologic-endoscopy/diagnostic-andtherapeutic-transvaginal-hydrolaparoscopy>. Accessed 10\_07\_2016
34. Sobek, A. Jr, Vodička, J.: *Transvaginal hydrolaparoscopy and ultrasonographically guided transvaginal hydrolaparoscopy - two outpatient methods of pelvis examination*. In: *Ceska Gynekol*, 2007, Vol. 72, Issue 1, p. 11-15.
35. Tanos, V., Bigatti, G.: *Transvaginal endoscopy: new technique evaluating female infertility. Three Mediterranean countries' experiences*. In: *Gynecol Surg*, 2005, Vol. 2, Issue 4, p. 241-243.
36. Târcoveanu, E.: *Bride și aderențe intraperitoneale postoperatorii - o problemă veche și mereu actuală*. In: *Jurnalul de Chirurgie Iasi*, 2006, Vol. 2, Issue 3, p. 245-248.
37. Tetering, E. A. A., Bongers, M. Y.: *Prognostic capacity of transvaginal hydrolaparoscopy to predict spontaneous pregnancy*. In: *Human Reproduction*, 2007, Vol. 22, Issue 4, p. 1091-1094.
38. Thausser, B. C. J. M., Tarlatzis, B.: *The Rotterdam ESHRE/ASRM-sponsored PCOS consensus workshop group, revised 2003 consensus on diagnostic criteria and longterm health risks related to polycystic ovary syndrome (PCOS)*. In: *Human Reproduction*, 2004, Vol. 19, Issue 1, p. 41-47.
39. van Tetering, E. A., Bongers, M. Y.: *Prognostic capacity of transvaginal hydrolaparoscopy to predict spontaneous pregnancy*. In: *Hum Reprod*, 2007, Vol. 22, Issue 4, p. 1091-1094.
40. Yang, Y., Ma, C.: *The usefulness of transvaginal hydrolaparoscopy in infertile women with abnormal hysterosalpingogram results but with no obvious pelvic pathology*. In: *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 2011, Vol. 155, Issue 1, p. 41-43.



Diagnosis and Treatment of Polycystic Ovary Syndrome: An Endocrine Society Clinical Practice Guideline. Authors: Richard S. Legro, Silva A. Arslanian, David A. Ehrmann, Kathleen M. Hoeger, M. Hassan Murad, Renato Pasquali, and Corrine K. Welt. Transvaginal imaging possibly inappropriate in certain circumstances (eg, adolescence) or certain cultures. TABLE 3. Other Diagnoses to Exclude in All Women Before Making a Diagnosis of PCOS. Disorder. Continuous positive airway pressure treatment of OSA in patients with PCOS demonstrated modestly improved IR after controlling for BMI ( $P = .013$ ) (144). In young obese women with PCOS, successful treatment of OSA improves insulin sensitivity, decreases sympathetic output, and reduces diastolic blood pressure.