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COMPARATIVE STUDY BETWEEN LAPAROSCOPIC AND ULTRASOUND GUIDED TRANSVAGINAL OVARIAN DRILLING IN POLYCYSTIC OVARY SYNDROME

By

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ABSTRACT

Background: Polycystic ovary syndrome is a heterogeneous clinical syndrome, which has been defined as the association of hyperandrogenism with chronic anovulation in women without specific adrenal and pituitary gland disease.

Objective: To compare the effect of laparoscopic ovarian drilling and ultrasonographic transvaginal ovarian drilling on patient with polycystic ovaries.

Patient and Methods: Forty women with ultrasonographic as well as clinic and /or biochemical findings consistent with PCOs will be recruited into the study from the outpatient infertility clinic at Syed Galal hospital between June 2015 and June 2016. All patients in the study are seeking for treatment of infertility. These patients are randomly divided into two groups; one group has traditional laparoscopic ovarian drilling while the other group has transvaginal ultrasonographic ovarian drilling.

Results: that there was a significant increase in FSH in both groups after treatment, but the improvement was higher in GI.

Conclusion: In this study we found that there was a restoration to normal cycle in both groups with marked improvement in GI than GII in all parameters (ovulation rate and pregnancy rate).

Key words: Polycystic ovary syndrome, gonadotrophines, menstrual disturbances, hyperandrogenism.

INTRODUCTION

Polycystic ovary syndrome is a clinical diagnosis characterized by the presence of two or more of the following features: chronic oligo-ovulation or anovulation, androgen excess and polycystic ovaries. It affects 5 to 10% of women of childbearing age and is the most common cause of an ovulatory infertility in developed countries. Common clinical manifestations include menstrual irregularities and signs of androgen excess such as hirsutism, acne, and alopecia *(Sirmans, S. M., & Pate, K. A. 2014).*

Polycystic ovary syndrome is a heterogeneous clinical syndrome, which has been defined as the association of hyperandrogenism with chronic anovulation in women without specific adrenal and pituitary gland disease. A family history of polycystic ovary syndrome may be present in a subset of

patients; however, the genetic basis of the syndrome remains unclear. Most often, the age of onset is perimenarchal and it is characterized by the appearance of menstrual disturbances, hirsutism and acne. Polycystic ovary syndrome is also associated with metabolic disturbances, such as obesity and insulin resistance with hyperinsulinemia, for which the pathophysiological role in the development of the syndrome has been recognized *(Legro, R. S., et al., 2013).*

Medical induction in anovulatory women with PCOs who fail to respond to clomifen citrate becomes complicated; as this involves parenteral administration of gonadotrophines, either human menopausal gonadotrophines (hMG) or pure follicular stimulating hormones (FSH) with or without pituitary down regulation with GnRH-analogue. However, these medications are relatively expensive, require extensive monitoring, and are associated with a significant risk of multiple pregnancy and ovarian hyperstimulation syndrome *(Balen, A. H., et al., 2016).*

Surgical treatment of anovulation in women with PCOs was introduced by Stein and Leventhal about 25 years before medical treatment was available, they performed bilateral ovarian wedge resection (BOWR) in a series of seven PCOs patients thereby removing one half to three fourths of each ovary. Interestingly, all women menstruated within six days postoperatively and three pregnancies occurred in two of these infertile women. At this stage (BOWR) was the treatment of choice for (BOWR) *(Sohn, et al., 2005).* Subsequently (BOWR) lost popularity as reported results were variable, with significant relapse rate, a high incidence of postoperative peri-adnexal adhesion formation 10 (Sarnie, A., et al., 2019).

A surgical approach to ovulation induction for PCOs holds many attractive advantages for patients over gonadotropine therapy because of cost in money, time and efforts. This line of therapy is extremely suitable to our patients *(Conway, G., et al., 2014).*

PATIENTS AND METHODS

Forty women with ultrasonographic as well as clinic and /or biochemical findings consistent with PCOs will be recruited into the study from the outpatient infertility clinic at Syed Galal hospital between June 2015 and June 2016. All patients in the study are seeking for treatment of infertility. These patients are randomly divided into two groups; one group has traditional laparoscopic ovarian drilling while the other group has transvaginal ultrasonographic ovarian drilling.

The inclusion criteria: All patients have the characteristic PCOs, plus at least one of the following associated symptoms (oligomenorrhea or amenorrhea, hirsutism or acne or obesity) and or endocrine abnormalities. All the patient will be unresponsive to treatment with clomiphene citrate in doses up to 150 mg/day for 5 days for at least 6 months. Others will be treated with FSH or hMG plus hCG and have failed to ovulate. Failure of ovulation will be confirmed by a combination of ultrasound scan and low midluteal phase serum progesterone (<3 ng/ml).All patients will be patent tubes on hysterosalpingography. None of the

patients will receive any hormonal treatment or drugs known to affect endocrine or metabolic parameters.

Exclusion criteria: Patients who will refuse the technique. Patients will be excluded from the study if they have other causes of infertility or any pelvic abnormality other than PCOs is evident during laparoscopic examination. Rare causes of hyperandrogenism such as Cushing syndrome, ovarian or adrenal tumors will be ruled out. Women with abnormal thyroid functions will be excluded from the study.

Statistical analysis of the data: Recorded data were analyzed using the statistical package for social sciences, version 20.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were expressed as mean± standard deviation (SD). Qualitative data were expressed as frequency and percentage.

RESULTS

The results of the present study are demonstrated in the following tables and figures.

Table (1): Comparison between Laparoscopic Ovarian Drilling and Ultrasonographic Ovarian Drilling according to Age, cycle regularity and BMI. Using: Independent Sample t-test; p-value >0.05 NS

There was no statistical significant difference between Laparoscopic Ovarian Drilling and Ultrasonographic Ovarian Drilling in age or in regularity of cycles or in body mass index.

Variables	Laparoscopic Ovarian Drilling *(n=20)*	Ultrasonographic Ovarian Drilling *(n=20)*	t-test	p-value
Age (years)	27.17±3.71	28.29±4.10	1.616	0.143
Irregular cycles	47.60±15.65	48.19±9.89	0.237	0.758
Body mass index	26.19±3.94	26.26±3.26	0.113	0.836

Table (1): Comparison between Laparoscopic Ovarian Drilling and Ultrasonographic Ovarian Drilling according to Duration of infertility, presence of hirsutism and duration of clomid therapy
Using: Independent Sample t-test; p-value >0.05 NS

There was no significant difference between Laparoscopic Ovarian Drilling and Ultrasonographic Ovarian Drilling in the duration of infertility and the duration of clomid use.

There was higher percentage of hirsutism in group I (40%) than group II (35%) but with no significant statistical difference.

Variables	Laparoscopic Ovarian Drilling *(n=20)*	Ultrasonographic Ovarian Drilling *(n=20)*	t-test	p-value
Duration of infertility (year)	**5.88±2.88**	**7.07±3.81**	**1.654**	**0.077**
Duration of clomid therapy(month)	**8.12±8.43**	**9.31±2.48**	**1.739**	**0.066**
Positive Hirsutism (%)	**8 (40%)**	**7 (35%)**	**0.160**	**0.663**

Table (2): Comparison between Laparoscopic Ovarian Drilling and Ultrasonographic Ovarian Drilling according to ovarian volume.
Using: Independent Sample t-test; p-value >0.05 NS

There was no significant in difference between Laparoscopic Ovarian Drilling and Ultrasonographic Ovarian Drilling according to ovarian volume.

Ovarian volume	Laparoscopic Ovarian Drilling *(n=20)*	Ultrasonographic Ovarian Drilling *(n=20)*	t-test	P
Range	9.60-19.19	10.23-18.24	0.745	0.337
Mean±SD	12.83±3.80	12.26±2.85		

Table (3): Comparison between Laparoscopic Ovarian Drilling and Ultrasonographic Ovarian Drilling according to FSH. Using: Independent Sample t-test;
p-value >0.05 NS; *p-value <0.05 S

There was significant in difference between Laparoscopic Ovarian Drilling and Ultrasonographic Ovarian Drilling according to After FSH and % improvement.

FSH	Laparoscopic Ovarian Drilling *(n=20)*	Ultrasonographic Ovarian Drilling *(n=20)*	t-test	p-value
Before	4.97±1.41	4.98±1.14	0.116	0.772
After	7.15±0.84	6.42±1.59	2.562	0.014*
% improvement	43.94	28.89	2.058	0.046*

Table (4): Percentage of cases with abnormal hormones before and after treatment among the studied groups
Using: Chi-square test; p-value >0.05 NS; *p-value <0.05 S

There was significant difference between groups after treatment in percentage of cases with FSH < 3.5, LH>11

	Laparoscopic Ovarian Drilling *(n=20)*		Ultrasonographic Ovarian Drilling *(n=20)*		X2	p-value
	No.	%	No.	%		
FSH						
<3.5 Before	3	15%	0	0%	4.541	0.026*
<3.5 After	7	35%	0	0%	6.243	0.013*
LH						
>11 Before	19	95%	20	100%	0.118	0.731
>11 After	0	0%	7	35%	6.243	0.013*

DISCUSSION

These results are in agreement with Farquhar C, et al. 2012 when comparing data, as the results were in agreement with the current study in greater change in AFC and AMH in serum than TVOI obtained at the time of IVM collection. However, pregnancy outcomes were similar between the two groups, as was the decrease in BMI. Indicating that despite moderate changes in markers secondary to outcomes obtained with TVOI compared to LOD, these changes are sufficient to lead to a good likelihood of pregnancy. Likelihood of pregnancy at 6 months of age in this study was consistent with the published results of pregnancy after LOD (35%) obtained in the most discontented meta-analysis comparing LOD and ovulation induction drugs in PCOS.

Also Ibrahim et al 2017 reported that there were insignificant differences as regarding base-line hormonal levels, including LH, FSH, LH/FSH, AMH, Proges-terone, SHBG.

This result is also in agreement with Kandil M, et al., 2018 when comparing data as no statistically significant differences were found between the two groups in terms of age and BMI.

However, both studies found that at 3 months of age, Patients in the LOD group experienced a significant decrease in AMH compared to the TVOI group in a manner similar to ours a study. However, we continued to see improvements in AMH and AFC levels at six months compared to the pre-treatment Baseline, which was lost at that point in the Qandil study Population *(Kandil M, et al., 2018)*.

The study also agreed with the *Zakherah MS, et al., 2011* study that a complication associated with LOD Ovarian failure. And the uncontrolled use of ironing has caused this to happen Cases where the ovary is basically "cooked", resulting in hormonal and ovulation failure. This is unlikely to be a risk With TVOI. A previous study investigated the results After IVM-induced ovarian injury *(Zakherah MS., et al., 2011)*.

One of the complications associated with LOD has been ovarian failure. Uncontrolled use of cautery has resulted in cases where the ovary was in essence "cooked" and hormonal and ovulation failure resulted. This is unlikely a risk with TVOI. A previous study has investigated outcomes after IVM-induced ovarian injury *(Zakherah MS., et al., 2011)*.

And it was clear from our study that there was no significant difference between laparoscopic ovarian drilling and ultrasound ovarian drilling in the duration of sterility and the duration of clomid use. There was a higher rate of hirsutism in the first group (40%) than in the second group (35%), but without statistically significant differences, as there was no significant difference between laparoscopic ovarian drilling and ultrasound ovarian drilling according to the size of the ovary. which was the same as the technique used in this study. Future studies should be directed at determining ideal levels of disruption to obtain ideal pregnancy rates using the TVOI approach. It may be hypothesized that passing a needle 30 to 40 times through the ovary may cause more pain than a standard IVF collection. However, in spite of this technique IVM collections

have previously been demonstrated to be less painful than IVF collections possibly because often smaller gage collection needles are used or lower suction pressure *(Seyhan A. et al., 2014).*

It is also evident from our study that there was a significant increase in FSH in both groups after treatment, but the improvement was higher in GI. There was a significant decrease in LH in both groups after treatment with a higher improvement in GI. There was a significant decrease in GI of testosterone while the decrease was minimal in GII. The improvement was higher in GI. There were statistically significant differences in the second group patients before and after with regard to the hormonal basal profile. At the end of our study, it became clear that there was no significant difference between the two groups according to abortion in the third and ectopic pregnancy.

This results is agree with *Ibrahim et al 2017* when report No statistically significant differences were found between the two groups in terms of ovarian volume (10.85±1.72 vs. 10.75 ± 1.62, P < 0.787).

In our finding when comparing two groups for FSH there was a significant difference between laparoscopic and transvaginal ovarian drilling guided by sound waves according to After FSH. This is in agreement with *Ibrahim et al. 2017* results indicating that there was a slight increase in FSH after treatment in Group A with laparoscopic ovarian drilling compared with group treatment with transvaginal ultrasound (6.95 ± 0.98 versus 5.66 ± 0.38, P <0.01).

Morad & Mohamed 2012 report There were non-significant differences between both groups as regards the rates of ovulation per cycle, pregnancy, miscarriage and trimester abortion The trimester abortion rate was similar in group A and B (13.33% vs 14.29%) respectively. This was comparable to (11.1% and 10.8%, respectively) reported by *Hashim et al 2015*.

This contrast with *Sorouri et al., 2015* in his study, found no significant difference in FSH in both groups (5.7±1.7 vs. 5.7±2.1, P =0.940).

Sorouri et al., 2015 In his study, found significant decreases in serum levels of LH and testosterone in both groups that were similar in both groups this agree with our result but in our result not similar in both groups There was high significant decrease in LH in both groups after treatment with higher improvement in GI. There was high significant decrease in GI in testosterone while the decrease was insignificant in GII. The improvement was higher in GI.

The study by *Ibrahim et al. 2017* demonstrated that the pregnancy rate was higher in group B (LE) than in group A (LOD), but although these differences were not statistically significant. The pregnancy rate was 35% in Group B (LE) while in Group A (LOD) it was 27.5%.

CONCLUSION

It can be concluded that, we found that there was a restoration to normal cycle in both groups with marked improvement in GI than GII in all parameters (ovulation rate and pregnancy rate).

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مقارنة بين تثقيب المبيض عن طريق المنظار البطنى وعن طريق المهبل مسترشدا بالموجات الصوتية فى حالات متلازمة تكيس المبيضين

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خلفيـــةالبحث: تمثـــل متلازمـــة تكـــيس المبـــايض الســـبب الأكثـــر شـــيوعًا لقلـــة الإباضـــة وانقطـــاع الإباضـــة فـــي عمـــوم الســـكان وفـــي الإنـــاث المصـــابات بـــالعقم. وبشـــكل صـــحيح، الإنـــاث المصـــابات بـــالعقم اللائـــي تعـــانين مـــن انقطـــاع الإباضـــة مرشـــحات لتحـــريض الإباضة.

الهـدف مـن البحـث: تقيـيم مـدى أمـان وفاعليـة الطـرق المختلفـة فـى تثقيـب المبـيض عـن طريـق منظـار الـبطن وعـن طريـق المهبـل مسترشـدا بالموجـات فـوق الصـوتية المهبليـة فـى حـالات تكـيس المبيض.

المريضـــات و طـــرق البحـــث: أجريـــت الدراســـة علـــى ٤٠ حالـــة تعـانى مـن تـأخر الحمـل بسـبب مـرض تكـيس المبيضـين مـن العيـادة الخارجيـة بمستشـفى سـيد جـلال الجـامعى خـلال الفتـرة مـن يونيـه ٢٠١٥ حتـى يونيـه ٢٠١٦. وقـد تـم تقسـيم هـذه الحـالات عشـوائيا إلـى مجمـوعتين: المجموعـة الأولـى خضـعت لعمـل تثقيـب المبـيض باسـتخدام المنظـار البطنـى والمجموعـة الثانيـة خضـعت لعمـل تثقيب المبيض عن طريق المهبل مسترشدا بالموجات الصوتية.

نتـــائج البحـــث: يفضـــل اســـتخدام المنظـــار البطنـــي فـــى عمـــل تثقيـــب المبـــيض لكـــى نتجنـــب حـــدوث التصـــاقات بعـــد العمليـــة. وأيضـــا يمكـــن تثقيـــب المبيضـــعن طريـــق المهبـــل مسترشـــدا بالموجـــات فـــوق الصوتية المهبلية فى تثقيب المبيض.

الاســـتنتاج: يمكـــن تنشـــيط التبـــويض عـــن طريـــق اســـتخدام أقـــراص لتنشـــيط المبـــيض و يمكـــن إعطـــاء أمبـــولات لتنشـــيط المبـــيض وفـــى حالـــة عـــدم اســـتجابة المبـــيض وفـــى حالـــه عـــدم اســـتجابة المبـــيض للعـــلاج الســـابق يفضـــل اســـتخدام المنظـــار فـــى عمـــل تثقيـــب المبـــيض لكـــى نتجنـــب حـــدوث التصـــاقات بعـــد العمليـــة. وأيضـــا يمكـــن تثقيـــب المبيضـــعن طريـــق المهبـــل مسترشـــدا بالموجـــات فـــوق الصـــوتية المهبلية فى تثقيب المبيض.