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Original Research Article

Comparative study of laparoscopic ovarian drilling and medical treatment in polycystic ovarian disease

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ABSTRACT

Background: To evaluate the result after medical treatment and laparoscopic ovarian drilling in PCOS patients and to compare the results of these two methods.

Methods: In this prospective study 50 women with polycystic ovarian disease, were divided into two group, 25 women received medical treatment and 25 women received surgical (laparoscopic ovarian drilling) treatment. Effect of treatment on ovulation, menstruation, fertility and androgen level was determined 3 month after therapy.

Results: There was significant increase in ovulation and fertility, decrease in androgen levels and decrease in LH/FSH in individual groups when compared with pretreatment levels but difference between groups A and B was not statistically significant for these parameters.

Conclusions: Medical treatment and laparoscopic ovarian drilling are equally effective in treating the women of polycystic ovarian disease. Result of both the treatment are similar in this study. However medical treatment should be the first line therapy, it has significant benefit for use in OPD, low cost, no hospital stays and convenience to the patient.

Keywords: Clomiphene citrate, Hyperandrogenemia, Laparoscopic ovarian drilling, Oligomenorrhoea, Ovulation, Polycystic ovarian disease

INTRODUCTION

Polycystic ovarian disease is a common disorder among women of reproductive age, with a prevalence of 5% to 15% in population worldwide.¹

PCOS is an endocrinal disorder, which is heterogenous in clinical presentation with collection of symptom and sign which include menstrual disturbances ranging from oligomenorrhoea to amenorrhoea, presence of acne and hirsutism, obesity. Raised testosterone level, raised L.H, insulin resistance, lipid profile changes and polycystic

ovaries in ultrasound scan are the biochemical and image feature seen with syndrome.²

According to Rotterdam criteria PCOS can be diagnosed by the presence of two out of following three criteria.³

- Oligo or anovulation
- Hyperandrogenism (clinical/biochemical)

Polycystic ovaries with exclusion of other etiologies. At least one ovary showing either 12 or >12 follicle (2-9 mm) diameter and ovarian volume more than or equal to 10ml. Women with PCOS have higher rates of

endometrial cancer, cardiovascular disease, dyslipidemia and Type II diabetes mellitus.⁴ Patients with PCOS having a greater prevalence of atherosclerosis and cardiovascular disease, benefited from calorie restriction even if it is not accompanied by weight loss.⁵⁻⁷ Low dose combined oral contraceptive pill act to cause reduction of LH secretion, inhibition of ovarian and adrenal androgen production and reduction of the free testosterone fraction secondary to increased SHBG production in liver.^{8,9}

Progestin present in oral contraceptive pills has protective effects on the endometrium.^{10,11} Oral contraceptive pills are considered the first line therapy in PCOS women, who want to avoid pregnancy.¹²

Insulin sensitizing drug, Metformin is now being considered as first line therapy in women with PCOS.¹³ It reduces hyperandrogenemia and restores normal secretion of LH. Long term administration of Metformin is seen to achieve reduction in both free and bound testosterone.¹⁴

In ovulation induction Clomiphene citrate is the drug of choice and first line drug.¹⁵ It is nonsteroidal selective estrogen receptor modulator.¹⁶ It is usually given in 5 mg oral tablet for 5 consecutive day start from day (2-6) or (5-9). Gonadotropin to be used in clomiphene resistant/failure. Injectable preparation of Human Menopausal Gonadotropin containing FSH (75 IU) and LH (75IU) or we can also use pure FSH (follitropin).

Surgical treatment of PCOS earlier included bilateral ovarian wedge resection, leading to resumption of normal menstrual cycle and ovulation. In initial series by Stein Leventhal the pregnancy rate was 85%. However subsequent reports have shown less success rates and increase risk of periovarian adhesions.¹⁷

Advance in laparoscopic techniques have resulted in renewed interest in ovarian drilling. Multiple studies have looked at the success of using method employing electrocautery, laser and all have shown equivalent success rate with resumption of ovulation and menstrual cyclicity in approximately 80% of patient, and 84% of women were still ovulating 20 years after surgery and that androgen level stayed normalized.^{18,19}

Potential advantage of laparoscopy included long term effect and repetitive ovulatory effect from single treatment.

Laparoscopic ovarian drilling is a surgical treatment that can trigger ovulation in women with polycystic ovarian syndrome who have not responded to weight loss and fertility medication.

Laparoscopic ovarian drilling is an effective procedure in women with clomiphene citrate resistant PCOS. It causes significant decline in testosterone level, LH/FSH ratio

with significant increase in FSH in both responder and nonresponder of clomiphene citrate.

METHODS

This is a prospective comparative study done over a period of one and half years from January 2016 to July 2017 in department of obstetrics and gynaecology in T.S Medical college Amausi Lucknow.

Enrolment criteria for PCOS included the following:

Women with complain of menstrual irregularities like oligomenorrhoea, amenorrhoea, infertility and chronic anovulation.

Women presenting with either clinical hyperandrogenism like hirsutism acne or biochemical evidence of hyperandrogenism.

Women having polycystic ovary on USG.

Women with congenital adrenal hyperplasia, Cushing syndrome, androgen secreting tumor, hyperprolactinemia, thyroid dysfunction were excluded from study.

Detail menstrual history, obstetric history were taken. USG showing polycystic ovaries, serum testosterone level, DHEAS, LH/FSH ratio and fasting glucose and insulin were done before receiving treatment. These patients randomly allocated into two groups. Group A received medical treatment and group B received surgical treatment by laparoscopic ovarian drilling. In medical treatment we had given low dose oral contraceptive pill with metformin or clomiphene and letrozole (if the patient had a complain of infertility). In laparoscopic ovarian drilling, destruction of ovarian tissue is done by using cautery and laser. We used perpendicular insertion of insulated needle into the ovary, using a short duration cutting current at 100w, then coagulation current at 40w for 2 sec. Process is repeated for upto 4 puncture sites per ovary. In both the groups patients were followed after 3 months.

RESULTS

Study included 50 women with symptom and sign of polycystic ovarian disease. Women were randomly allocated into two groups. Group A-women received medical treatment while Group B-women received laparoscopic drilling (Table 1).

The demographic profile and baseline clinical data like age, parity and menstrual pattern, ovulation, LH/FSH Ratio, insulin level, serum androgen level were taken, There was no significant difference in baseline and clinical data like age, parity, ovulation, LH/FSH ratio, serum insulin level, serum androgen level (p value >0.05) (Table 1).

Table 1: Comparison of medical treatment with laparoscopic ovarian drilling in both the groups.

	Group A (n=25)		Group B (n=25)		p value
	No. of cases	Percentage	No. of cases	Percentage	
Anovulation					
Before treatment	20	80%	21	84%	0.71
After treatment	5	20%	4	16%	
P value	p=0.0002		p=0.0001		
Oligomenorrhea					
Before treatment	19	76%	18	72%	0.74
After treatment	7	28%	6	24%	
P value	p=0.000017		p=0.00002		
Hyperandrogenemia					
Before treatment	18	72%	19	76%	0.47
After treatment	6	24%	4	16%	
P value	p=0.0018		p=0.0005		
Increased LH/FSH Ratio					
Before treatment	15	60%	14	56%	0.77
After treatment	9	36%	10	40%	
P value	p=0.00053		p=0.0038		
Conception					
After treatment	13	52%	14	58%	0.78

DISCUSSION

In present study we compared the result after medical and surgical treatment (laparoscopic ovarian drilling) in PCOS. Both medical and surgical treatment are effective in improving in ovulation and normalizing the menstrual cycle, androgen level and insulin level.

Effects on ovulation after medical and surgical treatment was statistically significant in both the groups individually however difference between group A and group B was not statistically significant. The result was similar to the study of Farquhar et al, Gomel V et al, Gabor Kovacs et al, Palomba S et al, and Saleh AM et al, who found no difference in ovulation after medical and surgical (laparoscopic drilling) treatment.^{18,20-23}

Effects on oligomenorrhoea after medical and surgical treatment is also statistically significant in individual groups. Cycle become regular in 72% of case in group A and 76% in group B. But statistical correlation between group A and group B is not significant (p value >0.05). The result was similar to the study of Palomba S et al and Saleh AM et al who found similar effect on menstruation.^{18,23}

Response of treatment on androgen level was also significant, but statistical correlation between group A and group B after treatment was not significant (p>0.05) The result was similar to the study of Farquhar et al, Gabor Kovacs et al, Homed HO et al who found similar effect on androgen level after medical and laparoscopic drilling.^{20,22,24}

Effects of treatment on conception was also significant in both the group individually, but statistical correlation between group A and group B was not significant (p>0.05). The result was similar to the study of Bayram et al, Imran Pirwany et al, Gomel V et al, Saleh AM et al who found no difference in conception after medical and surgical (laparoscopic drilling) treatment.^{18,21,25,26}

On comparing both the group using independent t test, we found that there is no statistical significant difference in both the group (p value >0.05). In the view of above observation it is concluded that medical treatment and endoscopic drilling are equally effective in treating the patient of PCOS. Result of both the treatment are similar in this study. However medical treatment should be the first line therapy, it has significant benefit for use in OPD, low cost, no hospital stay and convenience to the patient. However when medical treatment fails and when patient resistant to medical treatment, endoscopic drilling may be preferred.

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REFERENCES

1. National institutes of department of health and human service. Beyond infertility PCOS NIH 2008,8:58-63.

2. Balen A. Pathogenesis of polycystic ovary syndrome- the enigma unravels?. *The Lancet.* 1999;354(9183):966-7.
3. Revised 2003 consensus on diagnostic criteria and long term health risk related to polycystic ovary syndrome (PCOS). *Hum Reprod.* 2004, 19:41-47.
4. McFarland C. Treating polycystic ovary syndrome and infertility. *MEN: Am J Maternal/Child Nursing.* 2012;37(2):116-21.
5. Birdsall MA, Farquhar CM, White HP. Association between polycystic ovary and extent of coronary artery disease in women having cardiac catheterization. *Ann Intern Med.* 1997;126:32-5.
6. Guzick DS, Tabbott EO, Sutton Tyrrell K, Herzog HC, Kullr LH, wolfson SK jr. Carotid atherosclerosis in women with polycystic ovary syndrome. Initial results from a case control study. *Am J. Obstet Gynecol.* 1996;174:1224-9.
7. Moran LJ, Brinkworth G, Noakes M, Norman RJ. Effects of lifestyle modification in polycystic ovarian syndrome. *Report. Biomed Online.* 2006;12:569-78.
8. Kahn JA, Gordon GM polycystic ovary syndrome. *Adolesc Med.* 1999;10:321-36.
9. Wiegratz I, Kuhl H. Long-cycle treatment with oral contraceptives. *Drugs.* 2004;64(21):2447-62.
10. Guzick PS, Polycystic ovary syndrome. *Obstet Gynecol.* 2004;103:181-93 .
11. Plosker SM. Polycystic ovary syndrome and insulin resistance. *Med health R I.* 2003;86:12-5.
12. Cheang KI, Nestler JE. Should insulin-sensitizing drugs be used in the treatment of polycystic ovary syndrome?. *Reproductive Biomed Online.* 2004;8(4):440-7.
13. Essah PA, Apridonidze T, Iuorno MJ, Nestler JE. Effects of short-term and long-term metformin treatment on menstrual cyclicity in women with polycystic ovary syndrome. *Fertil Steril.* 2006;86(1):230-2.
14. Baillargeon JP. Use of insulin sensitizer in polycystic ovarian syndrome. *Curr Opin Investing Drugs.* 2005;6:1012-22.
15. Franks S. Assessment and management of anovulatory infertility in polycystic ovary syndrome. *Endocrinol Metabol Clinics.* 2003;32(3):639-51.
16. Pritts EA. Treatment of the infertile patient with polycystic ovarian syndrome. *Obstet Gynecol Survey.* 2002;57(9):587-97.
17. Leclair C, Patton PE. Advances in polycystic ovary syndrome treatment: metformin and ovarian diathermy. *Current women's health reports.* 2002;2(5):333-7.
18. Saleh AM, Khalil HS. Review of nonsurgical and surgical treatment and role of insulin sensitizing agent in the management of infertile women with polycystic ovary syndrome. *Acta Obstet Gynecol Scand.* 2004;83:614-21.
19. Nestler JE, Jakubowicz DJ. Decrease in ovarian cytochrome p450c17 alpha activity and serum free testosterone after reduction on insulin secretion in polycystic ovary syndrome. *N Engl J Med.* 1996;335:617-23.
20. Farquhar C, Brown J, Marjoribanks J. Laparoscopic drilling by diathermy or laser for ovulation induction in anovulatory polycystic ovary syndrome. *Cochrane database of systematic reviews.* 2012(6).
21. Gomel V, Yarali H. Surgical treatment of PCOS associated with infertility. *Reprod Biomed Online.* 2004;9(1):35-42.
22. Gobar Kovacs, Hellen buckler, Mohanbangah. Treatment of anovulation due to PCOS by laparoscopic ovarian electrocautery *BJOG.* 1991.
23. Palomba S, Orio Jr F, Falbo A, Russo T, Caterina G, Manguso F, et al. Metformin administration and laparoscopic ovarian drilling improve ovarian response to clomiphene citrate (CC) in oligo-anovulatory CC-resistant women with polycystic ovary syndrome. *Clinic Endocrinol.* 2005;63(6):631-5.
24. Hamed HO, Hasan AF, Ahmed OG, Ahmed MA. Metformin versus laparoscopic ovarian drilling in clomiphene-and insulin-resistant women with polycystic ovary syndrome. *International J Gynecol Obstetr.* 2010;108(2):143-7.
25. Bayram N, Van Wely M, Kaaijk EM, Bossuyt PM, van der Veen F. Using an electrocautery strategy or recombinant follicle stimulating hormone to induce ovulation in polycystic ovary syndrome: randomised controlled trial. *BMJ.* 2004;328(7433):192.
26. Pirwany I, Tulandi T. Laparoscopic treatment of polycystic ovaries: is it time to relinquish the procedure?. *Fertil steril.* 2003 Aug 1;80(2):241-51.

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