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 endocrinial disorder, which is heterogenous in clinical presentation with collection of symptom and sign which include menstrual disturbances ranging from oligomenorrhoea to amenorrhea, 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. 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. 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.

Progesterin present in oral contraceptive pills has protective effects on the endometrium. Oral contraceptive pills are considered the first line therapy in PCOS women, who want to avoid pregnancy.

Insulin sensitizing drug, Metformin is now being considered as first line therapy in women with PCOS. 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.

In ovulation induction Clomiphene citrate is the drug of choice and first line drug. It is nonsteroidal selective estrogen receptor modulator. 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.

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.

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 gynaeecology in T.S Medical college Amausi Lucknow.

Enrolment criteria for PCOS included the following:

- Women with complain of menstrual irregularities like oligomenorrhea, amenorrhea, 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 up to 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.

<table>
<thead>
<tr>
<th></th>
<th>Group A (n=25)</th>
<th></th>
<th>Group B (n=25)</th>
<th></th>
<th>p value</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>No. of cases</td>
<td>Percentage</td>
<td>No. of cases</td>
<td>Percentage</td>
<td></td>
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<tr>
<td>Anovulation</td>
<td></td>
<td></td>
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<tr>
<td>Before treatment</td>
<td>20</td>
<td>80%</td>
<td>21</td>
<td>84%</td>
<td>0.71</td>
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<tr>
<td>After treatment</td>
<td>5</td>
<td>20%</td>
<td>4</td>
<td>16%</td>
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<tr>
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<td>p=0.0002</td>
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<td>p=0.0001</td>
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<td>Oligomenorrhea</td>
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<tr>
<td>Before treatment</td>
<td>19</td>
<td>76%</td>
<td>18</td>
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<tr>
<td>After treatment</td>
<td>7</td>
<td>28%</td>
<td>6</td>
<td>24%</td>
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<td>p=0.00002</td>
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<td>Hyperandrogenemia</td>
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<tr>
<td>Before treatment</td>
<td>18</td>
<td>72%</td>
<td>19</td>
<td>76%</td>
<td>0.47</td>
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<tr>
<td>After treatment</td>
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<td>p=0.0005</td>
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<td>Increased LH/FSH Ratio</td>
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<tr>
<td>Before treatment</td>
<td>15</td>
<td>60%</td>
<td>14</td>
<td>56%</td>
<td>0.77</td>
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<tr>
<td>After treatment</td>
<td>9</td>
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<td>10</td>
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<td>Conception</td>
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<tr>
<td>After treatment</td>
<td>13</td>
<td>52%</td>
<td>14</td>
<td>58%</td>
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</table>

**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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**Conflict of interest:** None declared

**Ethical approval:** The study was approved by the Institutional Ethics Committee

**REFERENCES**
