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OVULATION RATE AND PREGNANCY RATE AFTER LAPAROSCOPIC OVARIAN DRILLING (LOD) IN INFERTILE FEMALE WITH POLYCYSTIC OVARY SYNDROME

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ABSTRACT

Objective: To determine the effectiveness and safety of laparoscopic ovarian drilling (LOD) in inducing ovulation and achieving pregnancy in women with polycystic ovary syndrome (PCOS) who failed to conceive after medical methods of ovulation induction**. Methods:** A total of 50 women underwent LOD during the study period. Majority were aged 20 to 38 years had primary or secondary infertility for more than 3 years, drilling done and follow up for ovulation and pregnancy rate was followed after 6 and 12 months. **Results**: after 6 months 23 patients got spontaneous ovulation and 20 of them achieved pregnancy, while after 12 months 38 patients got ovulation and 41 patients became pregnant, no postoperative complications happened after all laparoscopic procedures. **Conclusion:** LOD helps in regulating ovulation and enhancing conception rates so it increases ovulation and pregnancy rate and also provides an opportunity to assess the pelvis for other potential causes of subfertility.

KEYWORDS: To determine the effectiveness pelvis for other potential causes of subfertility.

INTRODUCTION

Polycystic ovary syndrome (PCOS) is a very common endocrine disorder accounting for 90% of anovulatory infertility.[1] Oligo-ovulation and anovulation in this group of women is a major cause of infertility needing treatment for ovulation induction or assisted reproductive techniques. Insulin resistance and hyperinsulinaemia are central to the pathophysiology of PCOS, but these features are clearly not essential to the development of the syndrome,

especially in lean women. Nevertheless, even if insulin resistance or hyperinsulinaemia is not the cause, it does amplify hyperandrogenism in women who gain weight. The mechanism of action of laparoscopic ovarian drilling (LOD) is not fully understood. It may act by destroying ovarian androgen-producing tissue and reducing the peripheral conversion of androgens to estrogens. However, others believe that ovarian diathermy works by increasing the sensitivity of the ovaries to endogenous follicle stimulating hormone (FSH), and that only a minimal amount of thermal injury is required.[2]

A fall in the serum levels of androgens and luteinising hormone (LH) and an increase in FSH levels have been demonstrated after ovarian drilling.[3,4,5]

We carried out this study to determine the effectiveness and safety of LOD in inducing ovulation in women with PCOS who failed to conceive after medical methods of ovulation induction.

Polycystic ovary syndrome can cause your body to produce too much testosterone and insulin, leading to fertility problems. High testosterone levels can cause irregular menstrual cycles, prevent ovulation and hinder pregnancy. PCOS treatments, including ovarian drilling, could help you conceive by regulating your hormone levels and improving your ovulation and menstrual cycles.[6]

Laparoscopic ovarian drilling is an interesting alternative approach to treat anovulatory polycystic ovary syndrome (PCOS) patients, although its indications are yet not well defined. The results are not superior to direct hormonal stimulation, but yield a lower multiple pregnancy rate and avoid the risk of ovarian hyperstimulation. Furthermore, laparoscopic ovarian drilling (LOD) normalises the hormonal environment, provides long-term effects and might improve the ovarian reaction to hormonal treatment. The need of a surgical approach and the formation of de novo adhesions is a major disadvantage of the method. In hyperinsulinemic patients, metformin treatment seems to offer higher pregnancy rates. Therefore, ovarian drilling must not be considered as the treatment of first choice. Patients with poor response to hormonal stimulation or disagreement with repeated multifollicular reaction to gonadotrophin stimulation might benefit from the surgical approach.[7]

METHODS

All 50 women in the study had ovulation induction with clomiphene citrate + gonadotropins for varying periods prior to having LOD. Women who were diagnosed to have PCOS by the Section Rotterdam criteria prior to laparoscopy were considered for the study. Rotterdam criteria defines PCOS in women with presence of two of the following three criteria: oligo-ovulation or anovulation; hyperandrogenism (clinical or biochemical or both); and polycystic ovaries, with the exclusion of other causes.[8] Polycystic ovary was defined as an ovary with 12 or more immature follicles measuring 2-9 mm in diameter. We excluded all women who had PCOS but associated with other associated infertility factor.

LOD was carried out at Al karkh maternity and gynecology hospital during the period of January 2013 till December 2015.

The techniques of LOD used in our hospital have been described previously (Li *et al.*, 1998; Amer *et al.*, 2002a). In most cases, a three-puncture laparoscopy was performed. A specially designed diathermy probe (Rocket of London, Watford, UK) was used to penetrate the ovarian capsule at 4 points with the aid of a short burst of diathermy. A monopolar coagulating current at 30 W power setting was used and the duration of each penetration was about 4 seconds. 4 punctures were made in each ovary depending on its size, each measuring 4 mm in diameter and 4 mm in depth. About 200 ml of Normal saline solution were instilled in the pelvis at the end of the procedure to prevent harmful thermal effect on the ovarian tissue.

Post-operative monitoring following ovarian drilling, women were asked to keep a record of their menstrual cycle during the first 6 and 12 months. If the patient started a menstrual period within 6 weeks of the surgery, a blood sample was taken on day 2 of that cycle for measurement of serum concentrations of LH, FSH, testosterone, androstenedione and SHBG. Another blood sample was taken on day 21 of the same cycle for measurement of serum concentration of pro gesterone. Ovulation was diagnosed when the progesterone level was ≥30 nmol/l. If spontaneous menstruation did not occur, a random blood sample was taken to measure all the above hormones at 6 weeks following surgery, also checking for pregnancy if menstrual cycle was missed by measuring B-HCG level.

RESULTS

After the first 6 months after LOD, 23 patients achieved pregnancy (46%) and only 20 patients (40%) had got pregnancy.

Table 1: Ovulation and pregnancy rate after 6 months.

No	Ovulation n (%)	Pregnancy n (%)
50	23(46%)	20(40%)

Then after one year i.e. 12 months after LOD, 41 patients achieved ovulation (82%) and only 38 OF them (76%) had got pregnancy.

These results means that LOD has an important role in increasing ovulation and pregnancy rate in infertile woman with PCOS.

Table 2: ovulation and pregnancy rate after 12 months.

No	Ovulation n (%)	Pregnancy n (%)
50	41(82%)	38(76%)

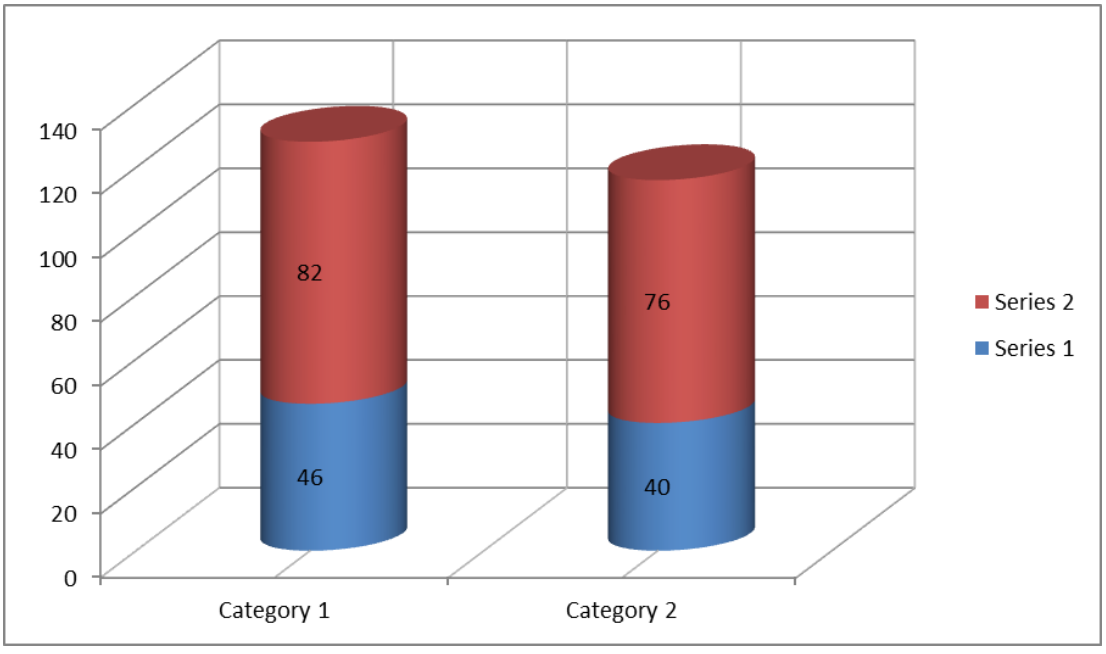

Figure shows the ovulation and pregnancy rate after 6 months (in blue) and 12 months (in red).

Category 1 ovulation rate and category 2 pregnancy rate.

DISCUSSION

According to Cochrane review in 2012, there was no evidence of a significant difference in rates of clinical pregnancy, live birth or miscarriage in women with clomiphene-resistant PCOS undergoing LOD compared to other medical treatments and the reduction in multiple pregnancy rates in women undergoing LOD made this option attractive.[9] Surgical therapy with LOD may reduce the need for gonadotropins or facilitate their usefulness. It is also useful in anovulatory women with PCOS who are unable to attend the hospital for intensive monitoring in the form of ultrasonic follicular scans required for gonadotropin therapy.[9] Consistent with findings from other studies.[10-12] none of our study population had ovarian hyperstimulation, which could be a significant benefit, compared to clomiphene or gonadotropin ovulation induction.

Anovulatory infertility in PCOS has traditionally been managed with clomiphene citrate and then gonadotropins or laparoscopic ovarian surgery in women who are resistant to clomiphene.[7] The ovulation rate after LOD varies between 70-80%, and the conception rate between 37-48%.[10] In a large randomised controlled trial from Netherlands.[13] comparing LOD to ovulation induction with recombinant FSH, women treated with diathermy took longer to conceive and 54% needed additional medical treatment to induce ovulation.

Pregnancy success rates from ovarian drilling range from 30% to 85%. A few studies have shown that success rates are higher in women within the normal range for BMI or Body Mass Index. In most cases, the risks of ovarian damage and other complications do not outweigh the benefits of the surgery. Make sure to discuss the procedure and the associated risks and benefits with your doctor before having any type of surgery.[14]

Laparoscopic ovarian drilling is an interesting alternative approach to treat anovulatory polycystic ovary syndrome (PCOS) patients. The results yield a lower multiple pregnancy rate and avoid the risk of ovarian hyperstimulation. Furthermore, laparoscopic ovarian drilling (LOD) normalises the hormonal environment, provides long-term effects and might improve the ovarian reaction to hormonal treatment. The need of a surgical approach and the formation of de novo adhesions is a major disadvantage of the method. In hyperinsulinemic patients, metformin treatment seems to offer higher pregnancy rates. Therefore, ovarian drilling must not be considered as the treatment of first choice. Patients with poor response to hormonal stimulation or disagreement with repeated multifollicular reaction to gonadotrophin stimulation might benefit from the surgical approach.[7]

CONCLUSION

We conclude that laparoscopic ovarian diathermy drilling increases the rate of ovulation and pregnancy in women with polycystic ovaries. This approach should be offered to the couple as second line therapy for those who fail to respond to medical methods of ovulation induction.

LOD helps in regulating ovulation and enhancing conception rates so it increases ovulation and pregnancy rate and also provides an opportunity to assess the pelvis for other potential causes of subfertility by laparoscopy.

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