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Original Research Article

Laparoscopic ovarian drilling in clomiphene citrate resistant polycystic ovarian syndrome patients

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ABSTRACT

Background: Polycystic ovarian disease (PCOD) or polycystic ovarian syndrome (PCOS) is a common endocrine disorder which commonly affects women in their reproductive age, often leading to anovulatory infertility. There has been a resurgence of surgical intervention with the advent of ovarian drilling. This study was performed to assess the surgical management for patients with PCOS resistant to hormonal therapy.
Methods: A thorough history and demographic details were taken from all the patients. A detailed clinical examination, along with transvaginal sonography was done. Laparoscopic ovarian drilling was performed on the patients under general anesthesia.
Results: Most of the women were in the 3rd decade of their life and majority of the women had attained menarche at 13 years. The chief complaint of the patients was irregular periods experienced by 80%. 44.4% of the patents had normal BMI, while 31.5% were underweight. Most of the patients (6.7%) showed no evidence of hyperandrogenism, while 20% had hirsutism, 11% had acne.
Conclusions: Polycystic ovarian syndrome is quite prevalent among the women of reproductive age. The effective treatment for PCOS which are resistant to hormonal therapy is laparoscopic drilling of the ovaries which results in ovarian function.

Keywords: Clomiphene citrate, Infertility, Laparoscopic ovarian drilling, Polycystic ovarian syndrome

INTRODUCTION

Polycystic ovarian disease (PCOD) or polycystic ovarian syndrome (PCOS) is a common endocrine disorder which commonly affects women in their reproductive age, often leading to anovulatory infertility. The prevalence of PCOD is estimated to be around 17-20%.[1-3]

The cause of PCOS is unclear and is reported that it is an X linked dominant condition.[4] The PCOS is accompanied by presence of enlarged ovaries along with small cysts measuring about 2-8 mm. They may be associated with a hypovascularized, androgen-secreting stroma having signs of menstrual cycle disturbance, obesity and excess androgen causing hirsutism, alopecia, acne.[5-7] High levels of testosterone, dehydroepiandrosterone sulfate (DHEAS) and androstenedione have been found in the serum of these patients. However, there are individual variations observed wherein the patient may have normal androgen levels.[8]

PCOS is also said to be associated with obesity and peripheral insulin resistance and hyperinsulinemia. Insulin resistance is usually secondary to the defect in post binding in insulin receptor pathways. Elevated insulin levels have a gonadotropin-augmenting effects on

ovarian function. Adiponectin, which is a hormone secreted by the adipocytes and regulates the lipid metabolism and glucose levels are also associated with PCOS. Low levels of adiponectin are seen in both obese as well as leaner women.[8]

During a normal ovarian function, the follicle is selected and responds to the follicle stimulating hormone for the appropriate signal for growth and ovulate. If this function is disturbed, the resultant is the production of small multiple cysts which may contain viable oocytes with dysfunctional polyps.[9] Another mechanism which has been proposed for anovulation and elevated androgen levels is that the increased levels of luteinizing hormone results in the increased simulation of theca cells of the ovaries. These in turn increase the production of the androgen hormones such as androstenedione and testosterones. Due to the decreased FSH levels in comparison to the LH, the ovarian granulosa cells cannot aromatize the androgens to estrogens, thus leading to the decreased levels of estrogen and anovulation.[4-5]

Most of the PCOS cases result in infertility, therefore, the treatment is of utmost importance. The first surgical intervention for PCOS was done in 1935, where laparotomy was the only treatment with bilateral ovarian wedge resection. This had lead to the restoration of normal and regular menses in 80% of the cases.[10-11] However, this method was not without complications such as ovarian and peri adnexal adhesions. Medical treatment of PCOS was later done using clomiphene citrate, which was the preferred mode and was considered the first line of therapy. In the case of poor response, stronger gonadotropins were used.[12]

There has been a resurgence of surgical intervention with the advent of ovarian drilling or ovarian electrocautery. This is used in patients who do not respond to clomiphene citrate treatment using mono or bipolar electrode or using laser energy. Laparoscopic surgery often follows along with the treatment with metformin or with OCP pills. This study was performed to assess the surgical management for patients with PCOS resistant to hormonal therapy.

METHODS

This study was conducted by the Department of Gynecology and Department of Surgery at Bhaskara Medical college from March 2016 to July 2017. All the women who had polycystic ovarian syndrome and were resistant to clomiphene citrate were included into the study. All these women went in for surgical management of PCOS. The procedure was properly explained to the patient as well as the relatives in detail and informed consent was taken from all the patients.

A thorough history and demographic details were taken from all the patients. A detailed clinical examination, along with transvaginal sonography was done. Hysterosalpingography was done for all the cases along with the tests for serum prolactin, follicle stimulating hormone and luteinizing hormone was done. Semen as collected for analysis from the spouses of all of them. Patients who went in for medical management of PCOS were excluded from the study.

General anesthesia given to all patients and endotracheal incubation was done. Introduction the laparoscope was done through sub umbilical level. 10.5cm trocar and cannula was used to puncture the abdomen. For diathermy probe and grasping forceps, 2-6 mm trocars were introduced into the iliac fossae. He diathermy probe was inserted to around 1 cm deep and 50 hz current was applied for 2 secs at 4 to 8 points into each ovary. Saline was introduced into the pouch of Douglas, in order to fasten the ovarian cooling.

RESULTS

A total of 54 patients underwent laparoscopic management of PCOS in the present study. Most of the women were in to 3rd decade of their life that is aged between 21-30 years (70.4%). 20.4% of them we below 20 years (Table 1).

Majority of the women had attained menarche at 13 years (39%), while some attained at the age of 14 years (22.2%). 9 (15.7%) had attained menarche at the age of 12 and 9% at the age of 15 (Figure 1).

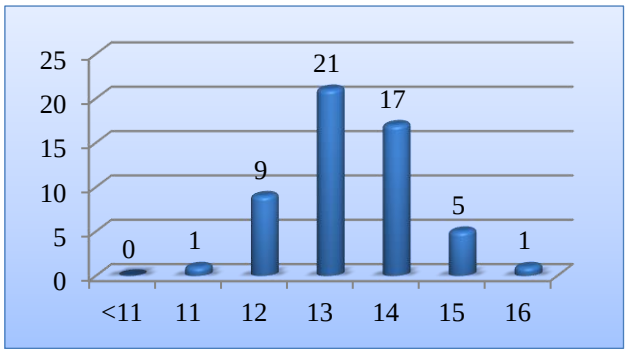

Figure 1: Age of attainment of menarche.

The chief complaint of the patients was irregular periods experienced by 80%. Of the 43 patients, 25 (58.1%) had oligomenorrhoea. 44.4% of the patents had normal BMI, while 31.5% were underweight. Most of the patients (6.7%) showed no evidence of hyperandrogenism, while 20% had hirsuitism, 11% had acne and 1 patient developed alopecia (Table 2).

Table 1: Age of the patients.

Age (in years)	Number	percentage
<20 (2nd decade)	11	20.4
21-30 (3rd decade)	38	70.4
>30 (4th decade)	5	9.2

The Luteinizing hormone levels of the patients were in the range of 21.5-42.0 mlU/ml while the mean was 26.2±3.95 mlU/ml. The Follicle stimulating hormone levels ranged from 5.68-11.1 mlU/ml with the mean being 6.6±1.26 mlU/ml (Table 3).

Table 2: Patients symptoms.

Symptoms	Number	Percentage
Menses		
Regular	11	20.4
Irregular	43	79.6
Oligomenorrhoea (N=43)		
Absent	18	41.8
Present	25	58.1
BMI		
Underweight (<18.5)	17	31.5
Normal (18.5-24.9)	24	44.4
Overweight (25-29.9)	8	14.8
Obese (≥30)	5	9.3
Evidence of Hyperandrogenism		
No Evidence	36	66.7
Acne	6	11.1
Alopecia	1	1.9
Hirsuitism	11	20.4

Table 3: Preoperative hormonal status of patients.

Hormone	Mean±SD	Range
LH (mlu/ml)	26.2±3.95	21.5-42.0
FSH (mlu/ml)	6.6±1.26	5.68-11.1
PRL (ng/ml)	18.9±3.26	13.2-26.9

Table: 4: Postoperative status of patients.

Status	Number	Percentage
Regularized cycles	47	87
amenorrheic	2	3.7
Amenorrheic after 1/2 periods	3	5.6
Pregnant	2	3.7

Post-surgery, 87% of the patients regained regularity in their menstrual cycle and 2 patients (3.7%) conceived before the first period. Less than 10% of the patients did not get the periods (Table 4).

DISCUSSION

PCOS is estimated to be present in around 4-8% of the women of the reproductive age.[5-13] This estimation has been observed in United States of America, England, Most of Europe, Australia as well as in Mexico.[14] Mecnaeche was achieved by most women between 12-14 years. This was very similar to the results in another study by Singh, Ramanand et al. This shows that the prevalence of PCOS is not related to the age of menarche.[16] The most common age In the present study to be affected with PCOS was 21-30 years. This was corroborated by a study by Dunaif et al, where it was found that the women in their 3rd or 4th decade of life were affected. This is because most of the symptoms are not evident until the woman reaches 20-30 years.[17] Another similar study by Singh et al reported similar results.[15]

The symptoms for most of the women was irregular periods which suggested the dysfunctional ovarian symptoms. Oligomenorrhoea was another symptom observed among these women. Similar results were observed in similar studies by Singh et al.[15]

Most of the patients in the present study had normal BMI or were under weight. Only round 20% of the patients were either overweight or obese. It was observed in one study that the patients with a BMI of more than 35kg/m2 had a lower rate of ovulation when compared to the ones in the normal range. However, this was not found to be statistically significant.[18]

It has been reported that the levels of the LH and testosterone fall after the LOD due to the restoration of the ovarian activity. This also results in the chances of conception as well as reduction of miscarriage.[19-20]

The levels of Luteinizing hormone was considerably higher before the surgery. In the present study, the mean LH levels was 26.2±3.95 mlu/ml. Similar case was observed in a study by Hayashi et al, who also observed the high levels of LH before the patients had undergone laparoscopic surgery.[21] In a retrospective study by Johannes et al, it was reported that the levels of LH, FSH, testosterone and androstenedione act as predictors for spontaneous ovulation after laparoscopic treatment.[22] In the present study, 87% of the patients had their menses regularized after the surgery and 2 (3.7%) had become pregnant before their first cycle. Around 10% were still amenorrhoeic.

In a study of 40 patients who underwent surgical procedure due to clomiphene citrate resistance, it was observed that an ovulation rate of 83% was observed which was in concordance to present study.[21] In yet another study by a Chinese group, 61% of the patients had normal ovulation after the surgery, showing that ovarian drilling was an effective method to induce ovulation in PCOS patients.[23]

CONCLUSION

Polycystic ovarian syndrome is quite prevalent among the women of reproductive age. The age of menarche is not one of the predictors for the prevalence though the levels of Luteinizing hormone is. The endocrine changes after the surgery is observing to fall to normal levels due to the functional ovaries resulting in feedback to the pituitary gland and hypothalamus. The effective treatment for PCOS which are resistant to hormonal therapy is laparoscopic drilling of the ovaries which results in ovarian function.

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