



## AN OBSERVATIONAL STUDY ON CORRELATION BETWEEN LIFESTYLE MODIFICATION AND BETTER PROGNOSTIC OUTCOME OF POLYCYSTIC OVARIAN SYNDROME CASES.

### Gynaecology

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### ABSTRACT

As our Honourable Scientists are inventing the gadgets for more and more comforts in life, we all are gradually getting us habituated with less and less physical activity and more tendency to have ready-made fast food for our time management. This new life style is gradually pulling us to face a new problem like PCOS with derangement of metabolic and hormonal changes with the consequences. To fight out the fangs of this disease we are now in need of changing our life style by fixing the time for adequate physical activity and maintaining a habit for good balanced diet.

**Materials and Method** This study was done among the patients attended the out patient department in Gynaecology, in Calcutta National Medical College and Hospital, West Bengal, over a period of one year from 1<sup>st</sup> January, 2017 to 31<sup>st</sup> December, 2017.

**Study design** - A Cross-Sectional Study.

**Results** Total 100 cases were studied, where 55 cases were unmarried and 45 cases were married. Among them, 59 cases were obese. Number of study population, presented with Infertility was 35. Among them, 11 cases were conceived by reducing their body weight and strictly following the advice of changes in their life style along with ovulation induction. 7 cases of Infertility were dropped out. 17 cases attended OPD at variable time, were still continuing.

Menstrual irregularities were corrected, by reducing the body weight, along with some sort of hormonal medication for six months to start with. Most resistant problem was hirsutism. All cases were strictly supervised by the Resource People regarding the life style changes.

**Conclusion** Nevertheless, we must enjoy the blessings of our advancement, but at the same time we must adopt the new life style planning for "no more extra calorie, and no more extra fat."

### KEYWORDS

Polycystic Ovarian Syndrom, Life Style Change, Physical Activity, Balanced Diet.

### BACKGROUND

Now-a-days, in the Gynae, OPD one of the common problems emerging is obviously the Polycystic Ovarian Syndrom, and still today the actual cause of this disease is unknown. Though, it is not a life threatening disease to start with, but its fangs have so many distressing situations like - obesity, hirsutism, menstrual irregularities, infertility, risk of diabetes and possible cardiovascular diseases, along with increased prevalence of endometrial, breast and ovarian carcinoma<sup>11,12,14,15,16,18</sup> – which ultimately may endanger the life.

To fight this multifaceted disease, there is an obvious positive impact lying on the lifestyle changes, in terms of corrected food habit and physical activity to solve the problems of PCOS before everything worsens<sup>1,2</sup>.

All the threats of PCOS are mostly due to unhealthy life style, unbalanced diets and lack of exercise<sup>10,11,12,14,15,16</sup>. This documental study was aimed to identify this group and manage their ailments by making them aware of the needs of these days by changing their lifestyle as far as they can. The Resource Persons of the society are also made involved for the positive impact of healthy balanced diet and regular physical activity to assign the better outcome.

### OBJECTIVES

1. To assess the correlation of PCOS patients, between lifestyle modification and improvement of symptoms and outcome of infertility.
2. To establish lifestyle modification is the first line of treatment of PCOS patients.

### STUDY DESIGN

This was a non-comparative cross-sectional open label study carried out over the period of 12 months. A total of 100 newly diagnosed post-pubertal PCOS patients, attended in Gynae.- OPD, were studied. Patients complaining of irregular menses and /or infertility, were enrolled as per inclusion and exclusion criteria after taking written informed consent.

### INCLUSION CRITERIA

Rotterdam criteria (2 out of 3 required)

1. Oligomenorrhoea / amenorrhoea
2. Hyperandrogenism (clinical or biochemical)
3. USG- polycystic ovary

### EXCLUSION CRITERIA

1. Thyroid disorders
2. Hyperprolactinemia
3. Cushing's syndrome
4. CAH
5. Multicystic ovary (USG)
6. Functional hypothalamic amenorrhea, and
7. Patients receiving drugs for any other systemic illness

### MATERIALS & METHOD

The present study was done among the patients attended the OPD in Gynaecology Department, CNMCH, Kolkata; over a period of 1 year, from 1<sup>st</sup> January, 2017 to 31<sup>st</sup> December 2017.

100 PCOS cases with varieties of clinical presentations, were selected and studied. Detailed menstrual history, marital status, their residence and the causes for which they were seeking medical advice, all were recorded. In patients, complaining of amenorrhea, pregnancy was ruled out. All the cases were clinically, biochemically and ultrasonographically assessed and diagnosed as Polycystic Ovarian Syndrome according to Rotterdam criteria. Cut-off body mass index (BMI) with body fat as Standard Consensus Statement of Indian population was considered, i.e., Normal BMI: 18.0-22.9 kg/m<sup>2</sup>, Overweight: 23.0-24.9 kg/m<sup>2</sup>, Obesity: >25 kg/m<sup>2</sup>. So, BMI ≥ 25 was considered as obese. Serum dehydroepiandrosterone (DHEA) and testosterone levels were measured in patient showing any sign of HA.

Then the data were collected regarding their age and marital status first, as because, the management of PCOS varies accordingly. The study of Geographical distribution of their residence was very informative. Clinical presentations were multifaceted. Majority cases were put in medication initially. Either no remarkable improvement were noticed or the conditions recurred. The patients were counselled repeatedly involving their family members about the lifestyle changes along with the medication. Resistant cases were guided more strictly, taking the

help of Dietician and involving the Department of Physical Medicine. In every visit the data (mainly weight loss, and improvement of clinical symptoms, urinary pregnancy test result for infertility patient) was collected to assess the final outcome.

## RESULT ANALYSIS

**TABLE 1** Distribution Of Cases According To Their Age And Marital Status

| Age in years | Unmarried (n=55) |       | Married (n=45) |       |
|--------------|------------------|-------|----------------|-------|
| 15 – 19      | 21               | 38.1% | 0              | 0%    |
| 20 – 24      | 19               | 34.5% | 13             | 28.8% |
| 25 – 29      | 9                | 16.3% | 17             | 37.7% |
| 30 – 34      | 4                | 7.2%  | 7              | 15.5% |
| >35          | 2                | 3.6%  | 8              | 17.7% |

This table is showing that majority numbers of patients are in 20 – 24 yrs. of age group (63.3%), and among married patients, they were mostly in the 25 – 29 age group (37.7%).

**TABLE 2** Geographical distribution of patients (n=100):

| Distribution of the residence | Number     | %   |
|-------------------------------|------------|-----|
| Urban                         | 73         | 73% |
| Semi urban                    | 21         | 21% |
| Rural                         | 6          | 6%  |
| <b>Total :</b>                | <b>100</b> |     |

This table is clearly showing that majority came from urban and from semi urban areas, where lifestyle means -- automobiles, no play, school and study only, and obviously the junk foods everywhere. Whereas rural people have to walk miles for everything for their day to day life and also get adequate space for play. As well as they are more habituated to homemade food. That is why, PCOS is less prevalent among rural ladies.

**TABLE 3** Prevalence of clinical presentation among unmarried ladies:

(n=55)

| Clinical Presentation                              | Number of cases | %      |
|----------------------------------------------------|-----------------|--------|
| Menstrual Problem                                  |                 |        |
| • Amenorrhoea + Hirsutism                          | 5               | 9.09%  |
| • Delayed cycle + Hirsutism                        | 15              | 27.22% |
| Cosmetic Problem                                   |                 |        |
| • Obesity + delayed cycle                          | 25              | 45.45% |
| • Hirsutism only                                   | 1               | 1.81%  |
| • Acne                                             | 1               | 1.81%  |
| • Obesity + Hirsutism                              | 3               | 5.45%  |
| Metabolic problems                                 |                 |        |
| • Menorrhagia with Obesity and glucose intolerance | 1               | 1.81%  |
| • Menorrhagia with Obesity and HTN                 | 1               | 1.81%  |
| • Amenorrhoea with obesity and depression          | 3               | 5.45%  |
| • Coronary disease                                 | 0               | 0%     |

Patients with hirsutism only, acne only, and obesity associated with hirsutism, were referred from Medicine OPD and Skin OPD after diagnosing the case as PCOS at their end. Obesity with delayed cycle cases were in majority, which had a great success with life style changes.

**TABLE 4** Prevalence of clinical presentation among married ladies.

(n=45)

| Clinical presentation                          | Number of cases | %     |
|------------------------------------------------|-----------------|-------|
| • Infertility                                  | 15              | 33.33 |
| • Delayed cycle and obesity (oligomenorrhoea)  | 6               | 13.33 |
| • Infertility with Obesity and Oligomenorrhoea | 20              | 44.44 |
| • Recurrent pregnancy loss                     | 3               | 5.45  |
| • Menorrhagia and hirsutism                    | 1               | 1.81  |
| <b>Total :</b>                                 | <b>45</b>       |       |

Table 3 and Table 4, are highlighting 59% cases of obesity. (33

unmarried case and 26 married case among total 100 cases). But majority of married women attended OPD due to infertility (35 case out of 45) and that is 77.7%.

**TABLE 5:** Outcome following supportive medicine only

| Parameters               | Total Case          | Resultant Case                | %     |
|--------------------------|---------------------|-------------------------------|-------|
| BMI                      | 59 cases were Obese | 50 cases with no improvement. | 84.7% |
| Menstrual irregularities | 77                  | 66 cases recurred             | 85.7% |
| Infertility              | 35                  | 2 cases had pregnancy         | 5.7%  |

The result was not satisfactory. May be the lady was not boosted up for reduction of weight, along with other lifestyle modification, in association with intake of medicine.

**TABLE 6 :** Outcome following strict life style changes and corrected food habit along with supportive medicine

| Parameters             | Total Case          | Resultant Case                                                                | % of success |
|------------------------|---------------------|-------------------------------------------------------------------------------|--------------|
| BMI                    | 59 cases were Obese | 55 cases attended with corrected BMI                                          | 93.2%        |
| Menstrual irregularity | 77                  | 52 cases attended with regular Menstrual cycle                                | 67.5%        |
| Infertility            | 35                  | -11 cases had pregnancy<br>- 7 cases dropped out<br>-17 cases were continuing | 31.4%        |

Table 6, revealing the achievement of the target ultimately, following a strict and formatted way, with an aim to reduce the body weight mainly. There is no way of definitive assessment that excess weight is the cause of Infertility, but we can say also, with confidence, that losing weight can improve fertility rate. Menstrual irregularity was also corrected following correction of hormonal imbalance which was helped immensely by reduction of bodyweight.

## DISCUSSION

In 1935, Stein and Leventhal described seven women presenting with oligo/amenorrhea combined with the presence of bilateral polycystic ovaries established during surgery. Three of these seven patients also presented with obesity, whereas five showed signs of hirsutism. Only one woman was both obese and showed hirsutism<sup>18</sup>. These findings imply that in case, polycystic ovary (PCO) is diagnosed by morphology in women with oligo/anovulation, not all the features which are believed to be associated with PCOS need to be present<sup>3,10</sup>. It has become evident that women with oligo/amenorrhea, obesity and hirsutism do not all have the typical PCO morphology on USG. In the present study also, a diverse presentation of PCOS was observed.

Maintaining the Rotterdam criteria<sup>14</sup>, which tells two of the following three features: oligo- or anovulation; clinical and, or, biochemical signs of hyperandrogenism; or, polycystic ovaries, -- cases were selected and observed.

In our study, among 100 cases, 59 women were obese. Majority of them had a fatty liver, 25 cases presented with hirsutism, and 77 patients had menstrual irregularities. 35 cases of PCOS sought medical advice for Infertility. In the present study, the mean age of the patients was 24.5. Oligomenorrhoea/Amenorrhoea was present in 74 cases (out of 100 i.e. 74%). 3 cases attended with Menorrhagia. Though more number of obese patients had oligomenorrhoea, the difference between obese and non-obese was not significant. Oligomenorrhoea is considered as a highly predictive surrogate marker of PCOS. Nurses' Health study II reported that over an 8-year period, the conversion rate to type 2 diabetes among oligomenorrhoeic women was approximately two-fold greater than that for eumenorrhoeic women, regardless of whether the oligomenorrhoeic women were obese or lean, indicating that oligomenorrhoea was an independent predictor of type 2 diabetes<sup>16</sup>.

Majumdar and Singh have compared the clinical features of PCOS in Indian women. The authors have reported prevalence of menstrual irregularities as 79.2% and 44% were obese women<sup>9</sup>. In the present study, we are reporting the prevalence of menstrual irregularities as 77% and obese women were 59%.

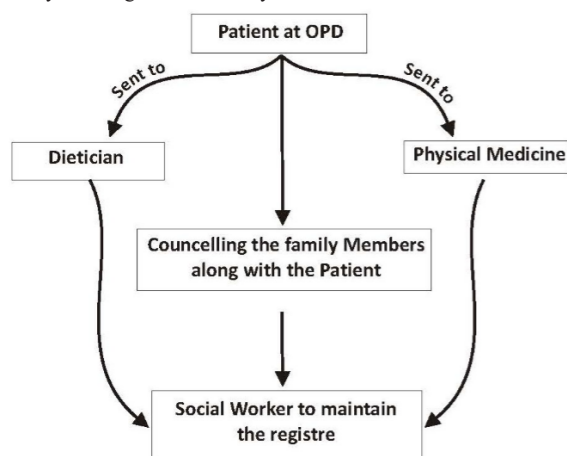
It is also a possibility that obese women, because of obesity become more health conscious, and/or have co-morbidities and seek medical advice as compared to non-obese women. Increase in weight as the age advances is a natural phenomenon, nonetheless young PCOS should be categorically advised to have or maintain a normal BMI. Obesity exacerbates the PCOS phenotype in previously asymptomatic individuals. So, weight reduction in adult women has been shown to improve free androgen levels, insulin sensitivity and ovulatory function<sup>12,17</sup>.

In our study, all 100 cases, at their first visit, were advised some supporting investigations including sonography of whole abdomen and pelvis. Along with it, to treat delayed cycle and amenorrhoea cases, some medicines were prescribed. At the same time counselling for good food habit and physical activity done also. They all were instructed for review with all reports.

On subsequent visit all were diagnosed as a case of PCOS mainly by ultrasonography reports. One interesting finding of fatty liver noticed in majority of cases. All were again counselled to maintain prescribed BMI, to change food habits and treatment with supportive medicines continued.

After 6 months, cases were reviewed. Less improvement noticed in cases of reduction of body weight. 84.74% remain obese (i.e. out of 59 cases, 50 cases remain obese). 85.71% cases recorded as recurrence of menstrual irregularities (i.e. among 77 cases, 66 cases recorded as recurrence). Only 2 pregnancy (5.7%) occurred among 35 cases.

The cases were again counselled stressing on lifestyle changes more strictly & through formatted way:



Here the parents were involved in cases of unmarried women and spouses were counselled too with the married ladies. They were referred to dietician for providing a healthy, nutritive and balanced diet chart, advised no more junk food; and 20 – 45 min. physical activity per day. The enjoyable brisk walking, jogging, the skipping, regular gym schools and particularly the swimming -- all were discussed to get rid of their ailments for which they were running here and there. Instead of 3 big meals, small 5 meals at regular interval and at fixed time, were also advised<sup>20</sup>. Ultimately, at their scheduled visit the target was achieved in majority of cases.

67.53% cases (52 cases out of 77) had their menstrual irregularities corrected even if following withdrawal of medicine. 93.22% (55 cases out of 59) cases of obesity presented with corrected BMI. Not only that, the ladies became very much conscious about not to take extra calorie as well as not to gain extra fat. Rather, they were enjoying their reduced body weight. 11 ladies (31.4%) had pregnancy out of 35 cases, and the others were listening them, how correction of BMI causes regularization of their menstrual cycle, when ovulation – induction clicked the success<sup>12,17</sup>.

## CONCLUSION:

During the last 2 decades, there has been a major alteration in life, running fast and fast and no time for defined physical activities, along with at-hand fast food, -- ultimately causing emergence of multifaceted disease like PCOS.

In this study, it has been noticed that short term weight loss has been consistently successful in reducing insulin resistance and restoring menstruation. But problems arise with maintaining all those changes; which should emphasize sustainable weight loss through dietary modification with food of low glycemic index and routine exercise. As because visceral fat is metabolically more active, it has been shown that only 5 – 10% reduction of body weight, causes significant loss of visceral fat<sup>6</sup>. Information about the food of low glycemic index is very important. High fibre foods like - beans and lentils, green and red peppers, broccoli, cauliflower, and Brussels sprouts, red leaf lettuce, almonds, berries, sweet potatoes, winter squash, pumpkin – all can help combat insulin resistance by slowing down digestion and may be beneficial to women with PCOS. Lean protein sources like tofu, chicken, and fish do not provide fiber but are very filling and a healthy dietary option for PCOS ladies. As anti-inflammatory foods like - spinach, tomatoes, kale, almonds and walnuts, olive oil, fruits like blue-berries and straw-berries; fish with omega-3-fatty acids like salmon and sardines, - all of them help reduce inflammation, which is very common in PCOS, causing them - more resistant to insulin, chronically fatigued and prone to gaining weight<sup>7,20</sup>. So all these foods should be recommended through diet chart and advised to follow these as much as possible, to reduce insulin level and to maintain the blood glucose level evenly, along with stability of other hormone levels.

Lastly, to conclude, with a “take home message”, which is rightly said that – rising from bed with a determination of adequate physical activity; planning of the time to stop and eat at fixed time, in small quantities at intervals; to have a glass of water and catch up the rest of the day<sup>2</sup>. And we, the Resource Persons, should always try to percolate this message to the society to prevent having PCOS or to guide the affected population rightly.

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