

# **Impact of polycystic ovarian syndrome -metabolic syndrome on pregnancy complication: Hospital based study at Alsulimaniya private hospital**

**By**

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## **Abstract:**

**Back ground:** Polycystic ovarian syndrome is one of the most common causes of unovulatory infertility which is presented by obesity, abnormal menstrual cycle and gonadotrophin secretion disorder. The aim of study was identify the relation between PCOS and metabolic syndrome and to estimate their effect on developing pregnancy complication. **Subject and method** It is a descriptive case series study from 1/5/2015-1/8/2017 at Al-Sulimanyia private hospital, 200 married patients with polycystic ovaries. **Results:** the menstrual cycle was found that 45% 90/200 were presented with secondary amenorrhea, secondary infertility was account 77.5%. clinical presentation of patients were with acne 25% 50/200, hirsutism 83% 166/200 while 6% 12/200 complained from decreased breast size and 37.5% 75/200 from depression. 9% 98/200 of patients had BMI more than 30 Kg/M<sup>2</sup> obese, By follow up of patients for 2 years the patients were having complications during pregnancy, gestational diabetes was account 37.5% 75/200, hypertension was 22.5% 45/200, abortion account 10% 20/200, preterm labour was 7.5% 15/200 while only 2.5% 5/200 developed cancer and 10% 20/200 were having more than one form of complications. It was founded that there is a significant relationship between secondary infertility and metabolic syndrome also between metabolic syndrome and pregnancy complications. **Conclusion** Polycystic ovaries had an association with metabolic syndrome and both had big role on occurring pregnancy complications.

**Key words:** PCOs, Metabolic syndrome, infertility

## INTRODUCTION

Unovulatory infertility is commonest complications of polycystic ovarian syndrome .PCOS classification depend on endocrine and clinical features with a well-diagnosed ovarian morphology in ultrasound, increase body weight ,abnormalities of menstrual cycle , hyperandrogenaemia , chronic ovulation failure ,abnormal secretion of gonadotrophin and insulin resistance<sup>(1 -3)</sup>.

Evidence suggests that PCOS is due to combination of genetic and non-genetic like environmental factors and metabolic disorder , mainly resistance to insulin and hyperinsulinemia, PCO is morphological ovarian phenotype in women with the polycystic ovary syndrome <sup>(4-6)</sup>.

About 7% of adult women suffer from PCOS, and family history of PCOS is relatively common, obesity can be increased due to eating unhealthy diet and decrease physical activity is implicated in PCOS, the role of infectious agents and toxins may be consider.<sup>(7,8,9)</sup>

Metabolic syndrome: define as having 3 or more of the following:

1-waist diameter in women > 88cm

2-serum glucose level at fasting at least 110 mg /dl,

3-serum triglycerides at fasting should be at least 150 mg /dl

4-HDL cholesterol < 50 mg/dl

5-Blood pressure at least 130/85 mmHg <sup>(10)</sup>

Risk of metabolic syndrome and resistance to insulin syndrome increased in women with PCOS. MBS includes a constellation of abnormalities in metabolism that confer increase chance of cardio vascular problems occurrence, diabetes Mellitus and problems in insulin action and B-cell function, defects that confer a substantially increase the possibility of glucose intolerance and diabetes Mellitus type 2.<sup>(11-13)</sup> Obesity is the putative denominators of Metabolic syndrome as the others are linked to the individual's metabolic susceptibility. Main indicator

of metabolic susceptibility is insulin resistance <sup>(14)</sup>. Obese as well as PCOS women appear to be affected by insulin resistance, as well as central adiposity. <sup>(15,16)</sup> The causes of polycystic ovary syndrome / Metabolic syndrome linkage seem to be correspond especially but not only to resistance of insulin and central obesity. The androgen excess may play a role in this linkage <sup>(17)</sup>.

## **Subject and Method:**

### **Administrative and Ethical Approval**

All patients were informed about the study and provided consent to participation. To delineate the risk factors associated with this disease, all the patients were subjected to specially constructed form which started by an interview and followed by thorough clinical examination and ended with some laboratory investigations, 20 patients refused the examination so they were excluded.

**Type of study:** A descriptive case series study designed to achieve the aim of study was carried from 1/5/2015-1/8/2017 at Al-Sulimanyia private hospital. And was following them for two years

**Type of sample:** Non-probability convenience sampling technique was carried 200 married patients with polycystic ovaries were enrolled in current study with clinical and ultrasound diagnosis of patients were proved and 2 years followed them their age from 18-42 years and body mass index was measured for each one before pregnancy, lipid profile assessment was done and risk factors were assessed. After interviewing, each patient was subjected to medical examination thoroughly; Blood pressure, weight and height of the persons were measured by the researcher. Body mass index BMI was calculated for each person, using the equation  $\text{weight [kg]} / \text{height [m]}^2$ .

### **Data collection**

Data collection tool was done by special designed form which including all information regarding the age, signs and symptoms of polycystic ovary syndrome and all clinical – laboratories finding. Data tabulated, analysis and interpreted was carried by applying SPSS soft ware program version 19.

## Results:

The age distribution of study samples was varies from 18 years old to 42 years age group 35-37 years was form 25% from study sample and 12.5% was within age group 38-42years which was lowest group. Regarding the menstrual cycle it was found that45% 90/200 were presented with secondary aminorrhoea while primary amenorrhea account 19%45/200 but irregular oligominorrhoea and irregular cycle were account 30% ,6% respectively as in table 1

**Table (1) criteria of study population age**

| Age ( year)                       | No. | %    |
|-----------------------------------|-----|------|
| <b>1-age</b>                      |     |      |
| 18-21                             | 35  | 17.5 |
| 22-24                             | 35  | 17.5 |
| 25-27                             | 30  | 15   |
| 28-34                             | 25  | 12.5 |
| 35-37                             | 50  | 25   |
| 38-42                             | 25  | 12.5 |
| Total                             | 200 | 100% |
| <b>2- type of menstrual cycle</b> |     |      |
| Primary aminorrhoea               | 38  | 19   |
| Secondary aminorrhoea             | 90  | 45   |
| Oligomenorrhoea                   | 60  | 30   |
| Irregular cycle                   | 12  | 6    |
| Total                             | 200 | 100% |
| <b>3- infertility</b>             |     |      |
| primary infertility               | 45  | 22.5 |
| secondary infertility             | 155 | 77.5 |
| Total                             | 200 | 100% |

From table 2 most of clinical symptoms were the study patients complained Described in this table like Acne about 25% 50/200 , hirsutism 83% 166/200 , deep voice 12.55 % 25/200 ,hair loss7.5% 15/200, while 6% 12/200 complained from decreased breast size and 37.5% 75/200from depression.

**Table 2 clinical features of study population**

| feature                   | No. | %    |
|---------------------------|-----|------|
| 1-Acne Yes                | 50  | 25   |
| No.                       | 150 | 75   |
| 2-hirsutism Yes           | 166 | 83   |
| No.                       | 34  | 17   |
| 3-Deep voiceYes           | 25  | 12.5 |
| No.                       | 175 | 87.5 |
| 4-Haire lossYes           | 15  | 7.5  |
| No.                       | 185 | 92.5 |
| 5-Decrease breast sizeYes | 12  | 6    |
| No.                       | 188 | 94   |
| 5-Depression Yes          | 75  | 37.5 |
| No.                       | 125 | 62.5 |

Regarding body mass index :BMI of study sample 49% (98/200) of patients had BMI more than 30 Kg/M<sup>2</sup> : obese and 26% 52/200 with BMI more than 25 Kg/M<sup>2</sup> while only one quarter of patients within normal BMI as in table 3.

**Table (3) BMI of study population**

| BMI criteria     | No. | %    |
|------------------|-----|------|
| BMI below 25     | 50  | 25   |
| BMI more than 25 | 52  | 26   |
| BMI more than 30 | 98  | 49   |
| total            | 200 | 100% |

By follow up of patients from researcher during study period for 2 years the patients were having complications during pregnancy ,gestational diabetes was account 37.5% 75/200m,hypertention was 22.5%45/200,abortion account 10% 20/200,preterm labour was 7.5% 15/200 while only 2.5% 5/200developed cancer and 10%20/200were having more than one form of complications as shown in table 4.

**Table (4) complication of pregnancy**

| Type of complication         | No. | %    |
|------------------------------|-----|------|
| 1-Hypertention               | 45  | 22.5 |
| 2-Diabetes mellitus          | 75  | 37.5 |
| 3-Abortion                   | 20  | 10   |
| 4-Preterm delivery           | 15  | 7.5  |
| 5-Abnormal vaginal bleeding  | 20  | 10   |
| 6-Ca                         | 5   | 2.5  |
| 7-more than one complication | 20  | 10   |

By applying test statistic, chi-square to study the effect of increase body mass index on pregnancy complications ,it was founded that there is a significant relationship between both variables ,p value less than 0.05 as explain in table (5).So study the effect of metabolic syndrome on pregnancy complications , it was founded that there is a significant relationship between both variables , p value less than 0.05 By applying test statistic , chi-square to as explain in table (65).

**Table 5 Test Statistics between Outcome , pregnancy complications , obesity and metabolic syndrome**

|               | Outcome | Obesity |
|---------------|---------|---------|
| Chi-Squarea,b | 118.500 | 22.120  |
| df            | 6       | 2       |
| Asymp. Sig.   | .000    | .000    |
|               | Outcome | Mbs     |
| Chi-Squarea,b | 118.500 | 37.000  |
| df            | 6       | 3       |
| Asymp. Sig.   | .000    | .000    |

The effect of metabolic syndrome on infertility ,it was founded that there is a significant relationship between both variables , p value less than 0.05 By applying test statistic , chi-square as explain in table(6).

**Table6:Test Statistics between infertility and metabolic syndrome**

|               | mbs    | infertility |
|---------------|--------|-------------|
| Chi-Squarea,b | 37.000 | 60.500      |
| df            | 3      | 1           |
| Asymp. Sig.   | .000   | .000        |

### **Discussion:**

The polycystic ovarian syndrome was frequent from 35- 37 years old which was form 25% from study sample. This result disagreed with other study done in Iraq that reported 59.8% of PCOS cases at 25-32years old<sup>(18)</sup>. amenorrhea 45%, and 30% oligmenorrhea , other study showed thatthe prevalence of oligomenorrhea is more 43.93%, while 22% have amenorrhea and 6.56% have regular cycles<sup>(18)</sup>.This study found that the 100% of PCOS developed infertility in both forms, primary and secondary account 22.5%, 77.5%. Other study found that infertility affects 40% of women with PCOS<sup>(2)</sup>, due toanovulatory infertility. Nearly 90%–95% of anovulatory women presenting to infertility clinics have PCOS. PCOS Women have adequate number of follicles, primary and secondary follicles are significantly increased,butas a result of derangements in factors that contribute in follicular development, the growth of follicular will be arrested when the follicles reach 4–8 mm indiameter. As a

result of dominant follicle does not develop, ovulation does not occur<sup>(19,20)</sup>. The frequent complaint was hirsutism about 83%, this agreed with other study done on Indian women, that showed 44.16% of PCOS women had hirsutism then acne 20% and baldness 6.66%<sup>(21)</sup>. But other study by Kiddy et al assured that hirsutism was the second common problem among attendants with Pcos about 64.49% of them<sup>(22)</sup>. About 49% of PCOS cases have (BMI) > 30 Kg/M<sup>2</sup> obese, this results assured by Pasqualiet al<sup>(23)</sup> who found that about 50% of PCOS women were obese. while other Iraqi study showed that 63.5% overweighted BMI more than 25kg/m<sup>2</sup><sup>(18)</sup>, the result also has been proved by Kiddy et al who found that 35% of PCOS women were obese<sup>(22)</sup>. The reasons of previous results of overweight, and obese might be due to the dietary habits in Iraq and absence of exercise between Iraqi women. But this result differ in an Indian study that found women who have PCOS, 71.8% were nonobese, 7.5% cases were overweight, and 20.7% were obese<sup>(24)</sup>.

Researchers followed up patients during period of study 2 years, the patients developed many complications during pregnancy like gestational diabetes which was account 37.5% while other study showed that 15 of 94 women 16% had gestational diabetes among those with PCOS cases<sup>(25)</sup>, this result agreed with other study done by Enrico Carmina who assured that 16% of PCOS cases had gestational diabetes<sup>(26)</sup>. Other study revealed that gestational diabetes occurred mostly in PCOS females than females without PCOS 20.46% vs. 10.54% subsequently<sup>(27)</sup>. The current work found that 22.5% of PCos cases had hypertension, But hypertension form 40% of PCOS cases reported by Enrico Carmina<sup>(26)</sup>. Many studies approved that PCOS females have high chance of getting hypertension, the mechanisms of elevated blood pressure in PCOS may be due to dysfunction of endothelial cells, which proved by elevation of endothelin-1 levels<sup>(28)</sup>, and elevation of aldosterone concentrations related to insulin resistance<sup>(29)</sup>. The results present 2.5% of PCOS developed cancer, in comparison with meta-analytic study which is demonstrated that PCOS doesn't increase the risk of breast cancer<sup>(32)</sup>, while other meta-analysis study about women with PCOS are more likely to develop cancer of the endometrium and ovarian cancer but have no chance to cause breast cancer.

**Ethical clearance:** Ethical clearance was taken from Al-Sulimanyia private hospital as well as all patients were informed about the study and provided consent to participation. Ethical clearance also taken from Tikrit medical college committee

**Source of funding :** self



## **Conflict of interest** Gynecology and obstetrics interesting

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