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A Prospective Study of Analysis of Polycystic Ovarian Syndrome in Infertile Women in Tertiary Care Hospital

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Abstract:
Introduction: *Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorder of reproductive age affecting 5% to 10% of women worldwide.[1] It is a heterogenous, multifactorial, complex genetic disorder.*
Materials and Methods: *A prospective study was performed at Department of obstetrics and gynecology, M.G.M medical College and Hospital, Jamshedpur over a period of 6 months. Women presenting with infertility were subjected to detailed history taking, general and gynecological examination. History was obtained for such as age, occupation, married life, type of infertility, parity index, menstrual history, obstetric history, sexual history and past medical or surgical illness. A comprehensive general examination was performed to note height, weight, BMI, thyroid enlargement, galactorrhea and hirsutism. Speculum, bimanual examination and ultrasound examination was carried out. Women with features of PCOS on ultrasound were identified and advised investigations such as serum FSH, LH (on day 2/3 of cycle), prolactin, AMH and laparoscopy when necessary.*
Results: *During the study period, 102 patients consulted the infertility clinic, out of which 56 were diagnosed with PCOS. The prevalence of PCOS was found to be 54.9% among infertile women. Among the 56 patients diagnosed with PCOS, 48 (85.71%) of them were in 21-30 years of age group, 7 (12.5%) of them were >30 years and 1 (1.78%) below 20years of age. The mean age of these women was 26.23±2SD as depicted in Table 1.*
Conclusion: *PCOS is a heterogenous disorder. There is a wide range in age of manifestation and symptomatology. Recent trends of sedentary lifestyle, carbohydrate and fat rich foods predispose adolescent girls to weight gain and high BMI. As a consequence, to these lifestyle changes there is an increased risk of PCOS, including hormonal imbalance, menstrual problems, infertility and altered pregnancy outcome in these women.*
Key Words: *PCOS, galactorrhea, hirsutism, FSH, LH*

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I. Introduction

Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorder of reproductive age affecting 5% to 10% of women worldwide.[1] It is a heterogenous, multifactorial, complex genetic disorder. [1]

PCOS was first described by Stein and Leventhal in 1935. In May 2003 Rotterdam consensus workshop was held in Rotterdam, Netherlands on PCOS, sponsored by European Society for Human Reproduction and Embryology (ESHRE) and the American Society for Reproductive Medicine (ASRM).[2,3] For diagnosis two out of three criteria should be fulfilled, they are:

- Oligo-ovulation or anovulation;
- Clinical and/or biochemical signs of hyperandrogenism (with the exclusion of other causes of androgen excess like cushing's syndrome, congenital adrenal hyperplasia, thyroid abnormalities, androgen-secreting tumours and hyperprolactinemia);
- Polycystic ovaries(PCO) detected on ultrasound.

The PCO definition was revised in 2003. Then Balen and co-workers suggested that 12 or more follicles in one ovary, each follicle measuring 2-9 mm in diameter and/or volume of the ovary >10ml.[4]

PCOS is frequently associated with obesity and insulin resistance. Obesity has long been recognized as one of the features of PCOS, and 40-80% of women with PCOS are overweight or obese.

The mechanisms by which obesity influences the pathophysiology and clinical manifestations of PCOS are not completely understood, but obesity has an important impact on the severity of hyperandrogenism, menstrual irregularities and insulin resistance.[5]The report of the bearded diabetic woman by Archard and Thiers in 1921 was a landmark in recognition of association between glucose intolerance and hyperandrogenism (HA).

The original National Cholesterol Education Programme-Adult Treatment Panel III (NCEP - ATP111) criteria in 2001 defines metabolic syndrome as the co-occurrence of three or more of the following risk factors (i) central obesity with waist circumference ≥88 cm in women, (ii) elevated systolic and/or diastolic blood pressure of ≥130/85 mmHg, (iii) impaired fasting serum glucose ≥110 mg/dL, (iv) elevated fasting serum triglycerides ≥150 mg/dL, and (v) fasting high-density lipoprotein (HDL) cholesterol <50 mg/dL.[6]

PCOS receives a considerable attention because of its high prevalence and metabolic, reproductive and cardiovascular consequences. Indians are known to have high prevalence of insulin resistance, so the prevalence of PCOS may be high in our population.

II. Materials And Methods

A prospective study was performed at Department of obstetrics and gynecology, M.G.M medical College and Hospital, Jamshedpur over a period of 6 months. Women presenting with infertility were subjected to detailed history taking, general and gynecological examination. History was obtained for such as age, occupation, married life, type of infertility, parity index, menstrual history, obstetric history, sexual history and past medical or surgical illness. A comprehensive general examination was performed to note height, weight, BMI, thyroid enlargement, galactorrhea and hirsutism. Speculum, bimanual examination and ultrasound examination was carried out. Women with features of PCOS on ultrasound were identified and advised investigations such as serum FSH, LH (on day 2/3 of cycle), prolactin, AMH and laparoscopy when necessary.

PCOS was defined by Rotterdam criteria (includes any 2), Clinical and/or biochemical hyperandrogenism, oligo-ovulation or anovulation, polycystic ovaries. The diagnosis of Polycystic ovaries was made on USG if there were presence of 12 or more peripheral follicles each 2-9 mm in diameter in one or both ovaries, increased ovarian volume (10cm3) in one or both ovaries.

Data were collected in a preformed data collection sheet. Collected data was compiled and tabulated in a Microsoft excel sheet and analyzed. Appropriate statistical parameters were used to analyze the patient distribution based on various parameters.

III. Results

During the study period, 102 patients consulted the infertility clinic, out of which 56 were diagnosed with PCOS. The prevalence of PCOS was found to be 54.9% among infertile women.

Among the 56 patients diagnosed with PCOS, 48 (85.71%) of them were in 21-30 years of age group, 7 (12.5%) of them were >30 years and 1 (1.78%) below 20years of age. The mean age of these women was 26.23±2SD as depicted in Table 1.

Variable	Distribution	Number	Percentage
Age	<20 years	1	1.78
	21-30 years	48	85.71
	31-35 years	07	12.5
BMI	<18 kg/m2	02	3.5
	18-25 kg/m2	25	44.64
	26-30 kg/m2	16	28.77
	31-35 kg/m2	11	19.6
	>35 kg/m2	02	3.5
Menstrual irregularity	Regular	23	41
	Irregular	33	59
Type of infertility	Primary	40	71.42
	Secondary	16	28.57
Hirsutism	Present	19	33.9
	Absent	37	66.1

Table 1: Age distribution, BMI, menstrual cycle, type of infertility and hirsutism among study subjects

Variable	Distribution	Number
LH/FSH ratio	<1	25
	1-2	18
	2.1-2.9	10
	≥3	03
TSH-Euthyroid	0.39-4.6 ml U/L	44
Sub clinical	4.6-20 ml U/L	04

Overt	>20 ml U/L	01
PRL	>25 ng/ml	04
USG	PCOS	47
	Normal	04
	Other features	06

Table 2: Investigations of the study subjects

Majority of these women had married life of 1-5 years (67.8%). Mean BMI among them was 27.24±2SD. Menstrual irregularity was found in 33 (59%) women, however, 23 (41%) had regular menstrual cycles. 4 among the 33 patients complained of dysmenorrhoea, 5 had heavy menstrual bleeding and 1 patient reported of having bleeding only after withdrawal was given. 40 (71.42%) were nulliparous and presented with primary infertility and 16 (28.57%) of them presented with secondary infertility, out of which 2 had previous ectopic pregnancies, 12 had previous miscarriages and 2 patients had preterm deliveries without a living issue.

Previous medical illness was reported in 15 (26.79%) patients. 3 of them had diabetes mellitus and were on treatment and 1 among them underwent gastric bypass surgery for the same. Hypothyroidism (10 patients), hyperprolactinemia (1) and asthma (1) were other medical illnesses noted. On examination, 19 (33.9%) were found hirsute, 8 (14.28%) had thyroid enlargement and 2 (3.57%) had galactorrhoea.5 women had evidence of PID and 1 had septate vagina on gynecological examination. Investigations as depicted in Table 2 revealed mean FSH and LH levels of 8.7±2SD and 13.7±2SD respectively and mean LH/FSH ratio of 1.57±2SD.

IV. Discussion

PCOS is closely associated with obesity, overweight and elevated BMI. Obesity is known to increase insulin resistance, hyperandrogenism and menstrual irregularities leading to further exacerbations of metabolic, reproductive and physiological features of PCOS. Mean BMI among the study patients was 27.24±2SD which indicates that majority of women were overweight (25- 29 kg/m2) and obese (>30 kg/m2). Similar findings were noted in various other studies.[7]

It has been suggested that even a modest loss of up to 5% of the initial body weight can result in spontaneous ovulation, restoration of menstrual cycle regularity, and pregnancy in obese women with PCOS. Menstrual irregularity is one of the key symptom of PCOS women and in present study, it was found in 59% women which correlates with other studies.Hirsutism was noted in 33.9% of women which was consistent with the findings published in literature of a few studies as 28% and 30%.[8] However, few studies have reported a higher incidence (64%) of hirsutism in women with PCOS. Derangement in the gonadotrophin ratio (FSH/LH) occurs in PCOS due to discriminate increase in LH levels. In the present study, deranged gonadotrophin ratio was noted in 54% of obese and overweight group. On ultrasound examination, 89.3% women were confirmed to have features of PCOS. Out of 56 women, 50 underwent laparoscopy for various reasons and 47 showed thickened, smooth and pearl-white outer surface of the ovary which were labeled as PCOS. However, laparoscopy was not used as a diagnostic purpose in these women.[9]

PCOS not only causes infertility but, if conceived also makes the women unable to maintain pregnancy. 25% of women in this study had history of at least single miscarriage. Hence, there is a need for intensified efforts in early detection, periodic monitoring and effective treatment in these high-risk women.[10]

V. Conclusion

PCOS is a heterogenous disorder. There is a wide range in age of manifestation and symptomatology. Recent trends of sedentary lifestyle, carbohydrate and fat rich foods predispose adolescent girls to weight gain and high BMI. As a consequence, to these lifestyle changes there is an increased risk of PCOS, including hormonal imbalance, menstrual problems, infertility and altered pregnancy outcome in these women. PCOS has high prevalence in infertile women. Apart from its impact on reproductive outcome, PCOS also presents with delayed manifestations which has many potential metabolic and cardiovascular risks if not managed appropriately. Lifestyle modification at early age, counselling of the parents, better knowledge and attitude of women towards PCOS is crucial in improving the quality of life in women with PCOS.

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