Original Article

PCOD

To See the Role of Metformin in Decreasing Hyperinsulinemia and Body Weight and Presentation of Poly Cystic Ovarian Disease

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ABSTRACT

Objective: The objective of this study is to evaluate the role of metformin in decreasing hyperinsulinemia and body weight in our population and see the pattern of presentation of PCOD

Study Design: **O**bservational / Descriptive study.

Place and Duration of Study: This descriptive study was held in the Gynecology Department of Peoples University of Medical and Health Science, Nawabshah Pakistan from 2nd Jan 2013 to Nov 2014.

Materials and Methods: Overall 329 cases satisfying the inclusion criteria were incorporated in the study. Criteria for inclusion were founded upon presence on U/S with two or further of the given criteria like hyperandrogenism, hirsutism, and oligomenorrhea and proportion of reversed LH: FSH.

After receiving well-informed consent, demographic data and comprehensive history were recorded on self-created questionnaire. A comprehensive analysis was conducted. Relevant analyzes were made and metformin was initialized with a dosage of 250 milligram s.i.d. (1/day) in starting then step by step adjusted to 500-milligram t.i.d. (thrice/day) for six months. Weight loss was promoted through exercise and diet. Cases were evaluated later than 6 months to analyze their serum fasting insulin and change in BMI. Statistical analysis was carried out by SPSS V.17.0. P value less than 0.05 taken significant after applying the paired t test and Chi-square test.

Results: Total 335 women were included in the study, but six patients had lost follow-up. Complete data was available for 329 patients, which is evaluated. Most common presentation of these patients with PCOD was oligomenorrhea which is seen in 253 (76.89%) patients. Mean serum fasting insulin before treatment was 23.47 micro U/ ml. After six months treatment with metformin, it decreases to 20.78 micro U/ ml (P=<0.001) . Mean body weight before treatment was 69.4 kg and after treatment, it was 68.8kg (P= 0.6167) .

Conclusion: Metformin was a useful treatment in decreasing the level of insulin. Further large sample size studies are required.

Key Words: PCOD, metformin, insulin level

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INTRODUCTION

Poly Cystic Ovarian Disease (PCOD) is a heterogeneous and prevalent state affecting 6% to 10% reproductive elderly females as well as 35% to 40% infertile females[1,2]. It is the commonest source of chronic ovulation[1,3,4]. The major current progress in the PCOD definition was acknowledged by PCOD consensus workshop in Rotterdam [5]. It was agreed by a workshop that 2 of following 3 criteria were needed so as to diagnose condition later than the exclusion of other androgen excess causes.

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These 3 criteria were; 1. An ovulation and/or oligo. 2. Biochemical and/or clinical hyperandrogenism signs. 3. Morphology of polycystic ovarian on U/S scan, described as the occurrence for ten or in the every ovary additional follicles (for the diagnosis only single ovary is adequate) that measure about 2-8 millimeters in diameter as well as for raised volume of ovarian (>10 ml). The clinical aspects in PCOD generally vary from without symptoms to obesity, hirsutism, menstrual abnormalities, acne & subfertility [6]. In PCOD biochemical modifications are a rise in LH level, U-turn of FSH/ LH proportion as well as in a few cases can possibly be increased levels of prolactin as well as testosterone. Transvaginal ultrasonography is valuable to diagnose PCOD. This syndrome, a complex disorder with manifold components, together with cardiovascular, metabolic and reproductive symptoms has long-standing implications throughout the life [7]. PCOD corresponds with the metabolic syndrome, marked with insulin resistance, hypertension, and dyslipidemia, which is related with raised probabilities for cardiovascular disease subsequently in life [8]. The relationship of resistance of insulin causative to

ovulation has caused fresh and progressing treatment of managing insulin sensitizing agents to females having PCOD so as to re-establish fertility as well as ovulation [9].

The relationship of PCODS is associated with hyperinsulinemia, the resistance of insulin and hyperandrogenemia are a significant element in reproductive abnormality[10,11]. Insulin resistance is the cause of metabolic disease which carries multisystem complications throughout the life span. Promoting the sensitivity of insulin by means of both lifestyle modification as well as appropriate treatment can upgrade these abnormalities. Hence, early diagnosis and management should be offered to women having PCOD. The purpose of this study is to assess metformin role in decreasing hyperinsulinemia and body weight in our population and see the clinical pattern of PCOD.

MATERIALS AND METHODS

This **o**bservational / descriptive study was performed in gynecology department of People University of Medical and Health Sciences Nawabshah, Pakistan from 2nd Jan 2013 to till Nov 2014. Overall 329 patients who were satisfying the criteria of inclusion were incorporated in this study. PCOD presentation was carried out on ultrasound with two or more of the given criteria like hyperandrogenism, hirsutism, and oligomenorrhea as well as reversed ratio of FSH: LH.

Hyperinsulinemia is defined as fasting serum insulin level >/=20 micro U/ml. weight in Kg and fasting blood sugar was documented. Females with decreased function of the kidney (creatinine >1.5) were not included due to the risk of lactic acidosis with metformin. After receiving well-informed consent, demographic data and comprehensive history were recorded on the self-written questionnaire. A comprehensive examination was conducted in each patient with BMI calculation. Applicable investigations were held and metformin was initialized with a dosage of 250 milligram s.i.d. (Latin: Semel in di; meaning 1 time/day) in starting then step by step adjusted to 500-milligram t.i.d. (Latin: ter in die; meaning thrice/day) for six months. Weight loss was promoted through exercise and diet. Patients were assessed later than 6 months for analyzing their serum fasting insulin and change in BMI. Statistical analysis was made by SPSS V.17.0 Paired t test and Chi-square test applied where suitable. P value below 0.05 was considered significant statistically.

RESULTS

Overall 335 women were incorporated in the study, but six patients had lost follow-up. Complete data was available for 329 patients, which is evaluated.

Most common presentation of these patients with PCOD was oligomenorrhea which is seen in 253 (76.89%) patients (Table 1).

Mean serum fasting insulin before treatment was 23.47 micro U/ ml. After six months treatment with metformin, it decreases to 20.78 micro U/ ml (P=<0.001) (Table 2).

Mean body weight before treatment was 69.4 kg and after treatment, it was 68.8kg (P= 0.6167) (Table 3).

Table No.1: Presentation of patients with PCODS n=329

Presentation	Frequency	Percentage
oligomenorrhea	253	76.89%
Hypomenorrhoea	84	25.53%
Amenorrhoea	67	20.36
Subfertility	53	16.10
Hirsutism	46	13.98
Weight gain	42	12.76

Table No.2: Changes in serum insulin levels after metformin therapy n= 329

Serum Insulin	Mean	95% CI	Standard Deviation	Standard Error of mean	P-value
Insulin before treatment	23.47	23.1 to 24.7	0.9930	0.07199	P < 0.001
Insulin after treatment	20.78	19.56-21.25	0.8480		
Difference	-2.69	-2.83 to -2.54	1.23		

Table No.3: Changing in body weight after metformin therapy n=329

Body Weight	Mean	95% CI for mean	Standard Deviation	Result of paired t- test
Body weight before treatment	69.4	67.3 – 77.8	13.2	P= 0.6167
Body weight after treatment	68.8	66.5 – 71.6	12.4	
Difference	0.58	-2.46 to -1.46	1.3	

DISCUSSION

In this study, we discussed the metformin effect over hyperinsulinemia as well as body weight. In our study, oligomenorrhea was observed in 76.89% of cases while hirsutism was found in 48.0% patients. Similar results are seen in a study conducted by Baen et al [12]. In another study conducted by Adil F, [13] oligomenorrhea was present in 79.68% of patients. In one more study, the most common indication was menstrual disorder seen among 84% of cases [14].

Although, oligomenorrhea was the commonest presentation in our study, normal menses were present in 27% of our patients. Similar results are seen in a study conducted by Balen et al [12].

Insulin resistance causing hyperandrogenism along with outcome anovulation is a newly realized significant

pathogenetic system in PCODS. Insulin resistance not only takes place in obese females with PCODS, where it can possibly be probable since obesity is often related to insulin resistance, but in 50 % of average weight females also with PCODS. Outcomes of our study demonstrate that metformin significantly lowers the fasting serum insulin level in patients. Alike outcomes are shown in a study carried out by Wang A.[15] One more study carried out by Zafar S, shows the same results [16]. Another study conducted by K-Idris[17] author shown that metformin significantly reduces hyperinsulinemia.

Weight loss has numerous advantageous effects on metabolic, endocrinological as well as clinical characteristics of patients representing with PCODS. In our study, no significant weight loss is seen later than 6 months of metformin treatment. Alike outcomes are exposed in a study carried out by Zafar S[16].

Kocak as well concluded that metformin treatment was efficient in decreasing hyperandrogenism as well as insulin resistance in females with PCOD [17].

It is greatly emphasized that correction of insulin resistance is important to lower the complications of pregnancy like miscarriage, IUGR, and development of gestational diabetes mellitus.

A challenge to health care expert must be the proper application of pharmacotherapies for improving insulin sensitivity, leading to advantageous modifications in PCODS.

CONCLUSION

Metformin was a useful treatment in decreasing the level of insulin. Further large sample size studies are required.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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