ORIGINAL ARTICLE

Frequency of Non-Obese Women with Polycystic Ovary Syndrome and Efficacy of Metformin in Non-Obese Women with Polycystic Ovary Syndrome

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ABSTRACT

Aim: To determine the frequency of non-obese patients presenting with polycystic ovary syndrome and efficacy of metformin in these patients

Methods: This descriptive case series study was conducted in Department of Obstetrics and Gynecology Unit III, Jinnah Hospital, Lahore from 29th October 2013 to 19th April 2014. Two hundred diagnosed patients of PCOS by presence of two of three factors i.e. oligomenorrhea or amenorrhea, clinical and/or bio-chemical signs of hyperandrogenism and polycystic ovaries on ultrasound examination showing at least one ovary with minimum of 12 follicles of a diameter of 2-9mm or a volume of >10ml were included. Frequency of non-obese patients (BMI< 25 kg/m^2) was determined. Efficacy was labeled if there was ovulation after 6 cycles determined bymid-luteal phase progesterone greater than 25 ng /ml.

Results: Mean age was 27.02±3.613 years. 63(31.5%) women were non obese while 137 women (68.5%) were obese. The non-obese women were treated with metformin. 43 women (21.5% of totaled sampled population and 65.2% of non -obese population) showed efficacy at end of 6 cycles.

Conclusion: It is concluded that frequency of non-obese patients is quite high in women with polycystic ovarian syndrome i.e.' 31.5% and metformin is efficacious in 65.2% non-obese polycystic ovarian syndrome patients.

Keywords: Polycystic ovarian syndrome, Efficacy, Metformin, Obesity

INTRODUCTION

One of the most common endocrinal problem in females during reproductive life is polycystic ovary syndrome (PCOS).[1] This condition also causes hyperandrogenism and oligo-anovulation which ultimately results in psychological, social, and economical problems[1].

Due to its physiological and metabolic effects on the body, PCOS is widely known as a metabolic syndrome.[2] It causes abnormalities like insulin resistance, hyperinsulinemia, obesity, dyslipidemia [decreased high-density lipoprotein (HDL) cholesterol and hypertri-glyceridemia and hypertension[2]. These metabolic abnormalities gathers together and produces increased risk of development of type 2 diabetes mellitus, endometrial hyperplasia and coronary artery disease.[2] The epidemiological studies reveal the prevalence of PCOS ranges from 3% to 23%[3]. Study from Pakistan depicts that the frequency of PCOS was 17.6% with increased rate of obesity (68.5%) and high level of insulin (59%). Females with normal BMI were only14% while 29.7% had BMI of 30 and 28.8% were having BMI above 30-35[4]. The use of insulin sensitizers like metformin, for the improvement of insulin resistance is considered to be of therapeutic value directly or indirectly in the management of PCOS.[5,6]

As obesity and insulin resistance is not observed in all patients with PCOS therefore it is uncertain whether insulin sensitizers would be beneficial in PCOS patients who have no insulin resistance[1]. Metformin, a second-generation biguanide, acts by stimulating transporters of glucose to facilitate glucose transport into hepatocytes and myocytes consequently reducing peripheral insulin resistance and serum glucose levels; but on giving it alone, hypoglycaemia do not occur because insulin release is not stimulated.[7]

While Kumari and co-workers showed entirely different results by showing that in non-obese and obese groups 15/17 women (88%) and 5/17 women (29%) ovulated resultantly comparison between the groups was found statistically significant[8] which creates discrepancy regarding effectiveness of the drug in obese versus non-obese women.

Some other studies[9-10] demonstrated that non-obese patients respond better than obese patients treating with metformin regimen but they did not record ovulation induction being the prime objective of the study. Tan[10] showed that metformin induced ovulation only in 59.5% non obese women with PCOS.

PATIENTS AND METHODS

This descriptive case series study was conducted in Obstetrics and Gynecology Unit III of Jinnah Hospital, Lahore between 29th October 2013 and 19th April 2014. Two hundred diagnosed patients of PCOS by presence of two of three factors i.e. oligomenorrhea or amenorrhea, clinical and/or bio-chemical signs of hyperandrogenism and polycystic ovaries on ultrasound examination showing at least one ovary with minimum of 12 follicles of a diameter of 2-9mm or a volume of >10ml were included. Frequency of non-obese patients (BMI< 25 kg/m^2) was determined. Efficacy was labelled if there was ovulation after 6 cycles determined by mid-luteal phase progesterone greater than 25 ng /ml. Metformin therapy was started in these patients at an oral dose of 500mg/ day for one week, then twice a day for another week and then was maintained at 1500 mg/

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day for 6 months. Follow up by the researcher was ensured on monthly visit of the patients to OPD. Detailed clinical, biochemical and ultrasound examination was repeated after completing 6 cycles of therapy. Efficacy, as per operational definition, was documented after six months of administration of metformin and all findings will be recorded. Data was entered and computed on SPSS-17.

RESULTS

Mean age was 27.02±3.61 years the age (Table 1). Sixty three women (31.5%) were non obese while 137 women (68.5%) were obese (Table 2). The non-obese women were treated with metformin 43 women (21.5%) responded efficaciously i.e. metformin is effective in 68.25% non-obese patients 20 patients did not responded to metformin (Table 3).

Table 1: Frequency of age (n = 200)

Age (years)	n	%age
<25	85	42.5
>25	115	57.5

Table 2: Frequency of obesity in women (=n=200)

Obesity	n	%age
Obese	137	68.5
Non-obese	63	31.5

Table 3: Frequency of efficacy of metformin (n=200)

Efficacy of metformin	n	%age
Yes	43	21.5
No	20	10.0
Not applicable	137	68.5

DISCUSSION

One of the most common endocrinal problem in females during reproductive life is Polycystic ovary syndrome (PCOS)[1]. This condition also causes hyperandrogenism and oligo-anovulation which ultimately results in psychological, social, and economical problems[1-10].

Due to its physiological and metabolic effects on the body, PCOS is widely known as a metabolic syndrome.[2] It causes abnormalities like insulin resistance, hyperinsulinemia, obesity, dyslipidemia [decreased high-density lipoprotein (HDL) cholesterol and hypertri-glyceridemia and hypertension[2]. These metabolic abnormalities gathers together and produces increased risk of development of type 2 diabetes mellitus, endometrial hyperplasia and coronary artery disease[11-15].

The age distribution in our sampled population shows that our sample is quite representative of total population as it is normally distributed. Mean age of 27 years shows that polycystic ovarian syndrome is a disease of adulthood. More young aspirant women are at the risk of developing this morbid disease the effects resulting from polycystic ovarian syndrome are quite stigmatizing.

Previously it was thought that polycystic ovarian syndrome is present in obese women only but our study has shown an increase risk in non-obese women too. The frequency of obesity in our study was 68.5% which is quite concordant with a previous Pakistani study[4]. Metformin has well established efficacy in obese women in reducing the effects of polycystic ovarian syndrome and patients regained ovulation resultantly in our study efficacy of metformin was 68.5%in non-obese women which is comparable to the results of Kumari et al[8]. They showed that 88% non-obese women have regained normal ovulation. Our results are bit high as compare to Tan[10]. He has shown that metformin induced ovulation in 59.9% of polycystic ovarian syndrome patients. Strength of our study is lab confirmation of regaining the ovulation process by measuring the mid- luteal phase progesterone greater than 25ng/ml. Limitations and weakness of our study is small sample size and no placebo. A better study with large sample size and comparison group is needed to further dig into causes and effects of metformin.

CONCLUSION

It is concluded that frequency of non-obese patients is quite high in women with polycystic ovarian syndrome i.e. 31.5% and metformin is effective in managing non-obese polycystic ovarian syndrome patients in 65.2%.

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