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A CASE REPORT ON POLYCYSTIC OVARY SYNDROME WITH METABOLIC COMPLICATIONS

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ABSTRACT

Background: Polycystic Ovary Syndrome (PCOS) is a rather common endocrine and metabolic disorder, mainly found in women of reproductive age. In many cases it goes together with obesity, insulin resistance, dyslipidemia and also trouble in glucose regulation, so the chance of later cardiovascular and other metabolic issues can rise over time. **Case Presentation:** A 26-year-old unmarried female came in with irregular menses, steady weight increase, acne, unwanted hair growth, darkening of skin in the neck folds, plus fatigue for about six months. On clinical exam there was obesity, central fat patterning, acne vulgaris, hirsutism, and acanthosis nigricans. Lab investigations suggested impaired fasting glucose, hyperinsulinemia, dyslipidemia, raised serum testosterone, and an LH:FSH ratio that was clearly increased. Pelvic ultrasonography showed bilateral polycystic ovaries with a lot of small follicles sitting around the edges. So she was diagnosed with PCOS along with metabolic syndrome, insulin resistance, dyslipidemia, obesity, and prediabetes. Treatment was not only one thing, it included lifestyle changes, metformin, hormonal management, diet guidance and regular follow-up visits. **Conclusion:** Early recognition of metabolic complications in PCOS is essential to prevent long-term morbidity. Multidisciplinary management and lifestyle interventions play a significant role in improving both reproductive and metabolic outcomes.

KEYWORDS: Polycystic Ovary Syndrome, Metabolic Syndrome, Insulin Resistance, Dyslipidemia, Obesity, Prediabetes, Case Report.

INTRODUCTION

Polycystic Ovary Syndrome, PCOS for short, stands as one of the most common hormonal disorders that affects women across their reproductive years. It mainly hits the ovaries, and that ends up causing a bunch of things kind of together, like menstrual cycle disturbances, fertility complications, plus other hormonal disorders and metabolic problems. Most women with PCOS tend to have irregular periods, and at the same time they might deal with excess hair growth and acne, and often a weight increase, too, along with the usual difficulties when trying to become pregnant.[1]

In recent years there seem to be more PCOS cases, people developed unhealthy eating patterns, and they also stopped exercising, plus high stress levels came in, and then weight gain followed. PCOS is mostly about reproductive health but it can also bring on serious metabolic issues, especially when doctors do not recognize and manage it early on. And honestly the condition can really shape how women look and how they feel emotionally, it affects their day to day life in a bigger way than people expect.[2]

PCOS seems to come from a mix of genetic factors, plus hormonal shifts and also environmental stuff. In a lot of cases insulin resistance is kind of the main reason behind PCOS, because the body just doesn't use insulin correctly. When insulin is not handled well, the insulin level goes up in the blood, and that ends up pushing the ovaries into making extra male hormones, often called androgens.[3] Then the whole hormonal climate changes, and the symptoms follow , like irregular menstruation, acne, and hirsutism, and sometimes weight gain too.

Obesity can be a dual threat because it makes insulin resistance worse, and it also intensifies the rest of the symptoms that come along with PCOS. A lot of women still stay undiagnosed for years , mainly because the signs may show up slowly and are often brushed off at the beginning stages , like "it's nothing" or "it'll pass".[4]

PCOS can lead to reproductive troubles along with a bunch of metabolic problems, like obesity, dyslipidemia, hypertension, insulin resistance, impaired glucose tolerance, and type 2 diabetes mellitus, all of that kind of thing. In general women who have PCOS are more likely to end up with cardiovascular diseases, those show up at a higher rate compared with women who don't have the condition. Central obesity together with a weird fat distribution shows up in these patients, and that part gives a big push toward their metabolic syndrome status.

So if someone shows signs that resemble PCOS, then they really should get early screening plus a metabolic assessment, not just one or the other. With early diagnosis and the right approach, it becomes easier to spot the related issues, and that helps create better reproductive and metabolic health outcomes through treatment.[5]

Diagnosing PCOS is basically a process that uses three steps, like clinical assessment, hormonal testing, and imaging examination, sort of in that order. The Rotterdam criteria are usually treated like the standard diagnostic method, and it asks that a patient shows three specific things too. These include irregular ovulation, either clinical or biochemical hyperandrogenism and then polycystic ovarian morphology, which the radiologists find through ultrasonography.[6]

When it comes to managing PCOS, the main objectives are symptom relief, restoring endocrine balance, improving insulin sensitivity, and also preventing metabolic disorders. So the starting point in treatment is lifestyle changes, like keeping a healthy diet, staying with regular physical activity, and reaching weight loss.

After that, physicians often rely on metformin, oral contraceptives and anti-androgen medications as the main treatment choices. They decide among them based on how the patient is presenting clinically, and also what other medical conditions might already be there.[7]

The current case report shows the medical condition of a young female patient who suffers from Polycystic Ovary Syndrome along with severe metabolic disorders, including obesity, insulin resistance dyslipidemia and prediabetes. It sort of illustrates how women with PCOS really do need early recognition along with appropriate metabolic evaluation and interdisciplinary management approaches. The combination of lifestyle adjustments together with medication support and routine clinical follow ups led to meaningful progress in both metabolic outcomes and reproductive health metrics. Overall the case also highlights that patient education plus continual health reassessments helps women with PCOS sustain better wellbeing and possibly avoid later, avoidable medical issues.[8,9]

CASE PRESENTATION

Patient Details: A 26-year-old unmarried female presented to the gynecology and endocrinology outpatient department with complaints of irregular menstrual cycles, gradual weight gain, excessive facial hair growth, acne, dark pigmentation over the neck folds, and generalized fatigue for the past six months. The patient belonged to a middle-class family and had a sedentary lifestyle with poor dietary habits and minimal physical activity.

Chief Complaints

The patient presented with:

- Irregular menstrual cycles for 6 months
- Progressive weight gain
- Excessive facial hair growth
- Acne over face
- Dark pigmentation over neck folds
- Generalized fatigue

History of Present Illness

The patient was apparently asymptomatic six months ago when she started experiencing irregular menstrual cycles associated with gradual weight gain. Initially, her cycles were delayed by 10–15 days, but later occurred once every 45–60 days. Over the following months, she noticed increased facial hair growth over the chin and upper lip along with acne over the cheeks and forehead.

She also developed dark discoloration over the neck folds and axillary region. The patient reported fatigue, reduced physical activity, and difficulty losing weight despite dietary modifications. She gained approximately

8 kg over the last six months. Due to persistence of symptoms and cosmetic concerns, she visited the hospital for further evaluation. There was no history of severe abdominal pain, fever, galactorrhea, abnormal vaginal bleeding, or thyroid-related symptoms.

Past Medical History
- No previously diagnosed diabetes mellitus
- No previously diagnosed hypertension
- No history of thyroid disorders
- No chronic kidney disease
- No liver disease
- No previous endocrine disorders
- No prior hospital admissions

Past Surgical History
- No previous surgeries
- No gynecological procedures

Medication History
- No regular medications before diagnosis
- Occasional use of analgesics for menstrual discomfort
- No prior hormonal therapy
- No history of corticosteroid use
- No known drug allergies

Menstrual History

Parameter	Details
Age at menarche	13 years
Menstrual cycle pattern	Irregular
Cycle interval	45–60 days
Duration of flow	4–5 days
Menstrual flow	Moderate
Dysmenorrhea	Mild occasionally

Dietary History
The patient consumed:
- Frequent fast foods
- Sugary beverages
- Fried snacks
- Bakery products
- Irregular meal timings

Low intake of:
- Fruits
- Vegetables
- Fiber-rich foods

Social History
- Sedentary lifestyle
- Minimal physical activity
- Prolonged screen time
- Disturbed sleep occasionally
- No smoking history
- No alcohol consumption
- No substance abuse

Family History
- Mother diagnosed with type 2 diabetes mellitus
- Father hypertensive
- Elder sister overweight with irregular menstrual cycles
- Positive family history of obesity and metabolic syndrome

Occupational History
The patient was working as a software trainee involving prolonged sitting hours, work-related stress, irregular food habits, and minimal physical activity.

Personal History

Parameter	Observation
Appetite	Increased
Sleep	Occasionally disturbed
Bowel habits	Regular
Bladder habits	Normal
Physical activity	Poor
Addictions	None

General Examination

Parameter	Observation
Height	160 cm
Weight	84 kg
BMI	32.8 kg/m²
Waist Circumference	98 cm
Blood Pressure	138/88 mmHg
Pulse Rate	86 beats/min
Respiratory Rate	18 breaths/min
Temperature	Afebrile

Significant Clinical Findings
- Central obesity present
- Acne vulgaris over cheeks and forehead
- Hirsutism over chin and upper lip
- Acanthosis nigricans over neck folds and axilla
- Increased abdominal adiposity

Systemic Examination
Cardiovascular System
- S1 and S2 heard normally
- No murmurs

Respiratory System
- Bilateral air entry present
- No added sounds

Central Nervous System
- Conscious and oriented
- No neurological deficits

Abdominal Examination
- Abdomen soft and non-tender
- Central obesity noted
- No organomegaly

Gynecological Examination

- External genitalia normal
- No abnormal vaginal discharge
- No pelvic tenderness
- Features suggestive of oligo-ovulation

Laboratory Investigations

Hematological Investigations

Investigation	Result	Reference Range
Hemoglobin	12.4 g/dL	12–15 g/dL
Total WBC Count	7,800 cells/mm³	4,000–11,000 cells/mm³
Platelet Count	2.8 lakh/mm³	1.5–4 lakh/mm³

Biochemical Investigations

Investigation	Result	Reference Range
Fasting Blood Glucose	118 mg/dL	70–100 mg/dL
Postprandial Blood Glucose	156 mg/dL	<140 mg/dL
HbA1c	6.0%	<5.7%
Serum Insulin	30 µIU/mL	2–25 µIU/mL
Total Cholesterol	228 mg/dL	<200 mg/dL
Triglycerides	248 mg/dL	<150 mg/dL
LDL Cholesterol	152 mg/dL	<100 mg/dL
HDL Cholesterol	38 mg/dL	>50 mg/dL

Hormonal Investigations

Investigation	Result	Reference Range
Serum Testosterone	Elevated	15–70 ng/dL
LH	Elevated	Normal
FSH	Normal	Normal
LH:FSH Ratio	3:1	<2:1
Serum Prolactin	Normal	Normal
Thyroid Function Tests	Normal	Normal

Imaging Findings

Pelvic Ultrasonography

Ultrasonography revealed:

- Bilaterally enlarged ovaries
- Multiple small peripheral follicles
- "String of pearls" appearance
- Increased ovarian stromal volume

Findings were suggestive of polycystic ovarian morphology.

Metabolic Complications Identified

- Obesity
- Central adiposity
- Insulin resistance
- Prediabetes/impaired glucose tolerance
- Dyslipidemia
- Borderline elevated blood pressure
- Metabolic syndrome

Final Diagnosis

Based on the patient's clinical presentation of irregular menstrual cycles, hirsutism, acne, obesity, and acanthosis nigricans along with laboratory findings including elevated serum testosterone, increased LH: FSH ratio, impaired fasting glucose, hyperinsulinemia, dyslipidemia, and ultrasonographic evidence of bilateral polycystic ovaries, the patient was diagnosed with Polycystic Ovary Syndrome associated with metabolic syndrome, insulin resistance, obesity, dyslipidemia, and prediabetes.

Treatment Details

On admission, the patient was counseled regarding the nature of Polycystic Ovary Syndrome and its association with metabolic complications such as obesity, insulin resistance, dyslipidemia, and prediabetes. Baseline investigations including blood glucose levels, lipid profile, hormonal analysis, and pelvic ultrasonography were reviewed. The patient was advised strict lifestyle modifications including calorie restriction, regular physical activity, avoidance of processed foods, and maintenance of proper sleep hygiene. Dietary counseling was provided to reduce intake of refined carbohydrates, sugary beverages, and oily foods while increasing consumption of fruits, vegetables, and fiber-rich foods.

On Day 1 of treatment, the patient was started on oral metformin 500 mg twice daily after meals to improve insulin sensitivity and impaired glucose tolerance. Combined oral contraceptive pills containing ethinyl estradiol and cyproterone acetate were initiated once daily for menstrual regulation and management of hyperandrogenic symptoms. Oral spironolactone 50 mg once daily was prescribed for treatment of hirsutism and acne. Vitamin D3 supplementation of 60,000 IU once weekly was also initiated to improve nutritional status and metabolic health.

During the first follow-up visit after two weeks, the patient reported mild gastrointestinal discomfort associated with metformin therapy, which gradually subsided with continued use and intake after meals. She was encouraged to continue regular exercise including

brisk walking for 30–45 minutes daily. Counseling regarding medication adherence and weight reduction strategies was reinforced by the clinical pharmacist.

At one month follow-up, the patient showed mild reduction in body weight and improvement in fatigue. Menstrual irregularity persisted but acne lesions had slightly reduced. Blood pressure and blood glucose levels were monitored regularly. The patient was advised to continue the same treatment regimen along with strict dietary modifications and physical activity.

At three months follow-up, significant improvement in menstrual regularity and reduction in acne were observed. Facial hair growth had reduced moderately. The patient lost approximately 4 kg body weight with improvement in waist circumference. Repeat blood investigations demonstrated improvement in fasting blood glucose and triglyceride levels. Medication adherence was satisfactory.

After six months of continuous treatment and lifestyle modification, the patient showed marked clinical improvement. Menstrual cycles became regular with intervals of 30–35 days. Significant reduction in acne, hirsutism, and acanthosis nigricans was noted. Body weight reduced by approximately 7 kg and metabolic parameters including fasting blood glucose, HbA1c, and lipid profile improved considerably. The patient was advised regular long-term follow-up to monitor metabolic and reproductive health outcomes.

S. No	Drug Name	Dose	Frequency	Route	Indication	Duration
1	Metformin	500 mg	Twice daily after meals	Oral	Management of insulin resistance and impaired glucose tolerance	6 months
2	Ethinyl Estradiol + Cyproterone Acetate (Combined Oral Contraceptive Pill)	0.035 mg + 2 mg	Once daily	Oral	Regulation of menstrual cycle and reduction of hyperandrogenism	6 months
3	Spironolactone	50 mg	Once daily	Oral	Management of hirsutism and acne	6 months
4	Vitamin D3	60,000 IU	Once weekly	Oral	Nutritional supplementation and metabolic support	8 weeks
5	Multivitamin Supplement	1 tablet	Once daily	Oral	General nutritional support	3 months

DISCUSSION

Polycystic Ovary Syndrome is one of the most common endocrine disorders affecting reproductive-aged women and is frequently associated with metabolic abnormalities. The present case demonstrated classical manifestations including menstrual irregularities, obesity, hirsutism, acne, and polycystic ovarian morphology. Insulin resistance plays a central role in the pathogenesis of PCOS by increasing ovarian androgen production and worsening metabolic dysfunction. Similar findings were reported by Azziz et al., who described the strong association between hyperandrogenism and metabolic disturbances in PCOS patients. Escobar-Morreale also emphasized that obesity and insulin resistance significantly contribute to disease severity and reproductive dysfunction in affected women.[10,11]

The patient in the present case showed metabolic complications including obesity, dyslipidemia, impaired fasting glucose, and insulin resistance, indicating metabolic syndrome associated with PCOS. Similar metabolic abnormalities were reported by Lim et al., who observed increased prevalence of obesity and central adiposity among women with PCOS. Diamanti-Kandarakis and Dunaif also reported that insulin resistance contributes significantly to impaired glucose tolerance and dyslipidemia in these patients. Early identification of metabolic complications is essential because these abnormalities increase the long-term risk of type 2 diabetes mellitus and cardiovascular diseases among women with PCOS.[12,13]

Management of PCOS mainly focuses on improving insulin sensitivity, correcting hormonal imbalance, and preventing metabolic complications. In the present case, lifestyle modifications along with metformin therapy resulted in significant improvement in menstrual regularity, weight reduction, and glycemic control. Similar outcomes were reported by Moran et al., who emphasized that weight loss and dietary modification improve both reproductive and metabolic parameters in PCOS patients. Legro et al. also reported beneficial effects of metformin in improving insulin resistance and ovulatory function. Multidisciplinary management and patient counseling are important for achieving long-term therapeutic success in women with PCOS.[14,15]

The coexistence of metabolic syndrome in women with PCOS substantially increases the risk of future cardiovascular diseases and type 2 diabetes mellitus. Therefore, regular monitoring and early intervention are essential. In the present case, continuous follow-up and pharmacist-led counseling improved medication adherence and lifestyle compliance. Teede et al. highlighted the importance of evidence-based

multidisciplinary management for improving reproductive and metabolic outcomes in PCOS patients. Rotterdam ESHRE/ASRM consensus guidelines also recommended early screening for metabolic abnormalities in women diagnosed with PCOS. Comprehensive care can significantly reduce long-term morbidity and improve quality of life in affected individuals.[16,17]

CONCLUSION

Polycystic Ovary Syndrome is a multifactorial endocrine disorder commonly associated with significant metabolic complications such as obesity, insulin resistance, dyslipidemia, and impaired glucose tolerance. The present case highlights the importance of early diagnosis through careful clinical evaluation, hormonal assessment, and metabolic screening. Timely initiation of lifestyle modifications along with pharmacological therapy resulted in considerable improvement in menstrual irregularities, metabolic parameters, and hyperandrogenic symptoms. Regular follow-up and multidisciplinary management play a crucial role in preventing long-term complications including type 2 diabetes mellitus and cardiovascular diseases. Early intervention and patient education can significantly improve overall reproductive, metabolic, and psychological outcomes in women with PCOS.

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