Diagnosing and Treating the Causes of Women's Polycystic Ovary Syndrome: Clinical and Prospective Study

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Abstract:

This article aims to identify the methods of diagnosis and treatment of the causes of women's polycystic ovary syndrome: Clinical and prospective study. One hundred and twenty – three women were medically diagnosed by both medical laboratory tests and ultrasound image machines. Moreover, a questionnaire was designed to question 25 specialized obstetricians and gynecologists to provide answers based on their practising and experience, regarding the methods of diagnosis, symptoms of polycystic ovary syndrome, causes and approved treatment methods for women with polycystic ovary syndrome. Data analysis using statistical program for social sciences (SPSS version 24). A descriptive and Analytical approach was adopted. The study concluded that 37% of the women with polycystic ovary syndrome aged from (20 to less than 40 years), and 59% of the women with polycystic ovary syndrome were found at weights ranging from (over 65 kg). The study indicated that diabetic patients (DN) were the higher percent of women with Polycystic Ovary Syndrome (29%), followed by women with heart disease (18%), followed by women with HTN (15%), followed by women with ASTHMA diseases (8%), followed by the women with ANEMIA diseases (7%). An irregular menstrual period, the appearance of acne, especially in the neck and armpits, oily skin, increased hair growth on the face, chest, or thighs, dark spots and thickening of the skin, head hair loss, hair on the face and body, overweight, and density hair on the face and body infertility are the main symptoms of polycystic ovary syndrome with (68%). The hormonal imbalances, insulin resistance, genetics, inflammation, hyperanrdogenism, anovulation, and infertility are the root causes of polycystic ovary syndrome (80%). HBA1C: cumulative sugar, prolactin, luteinizing hormone (LH), follicle-stimulating hormone (FH), testosterone, and estrogens are the core methods to diagnose women with polycystic ovarian syndrome. Lifestyle, medication, Assisted Reproductive Technology (ART), and psychological support were approved by the experts in this field as the main methods of polycystic ovary syndrome treatment (72%).

Keywords: Polycystic ovary Syndrome, Symptoms, Causes, Treatment.

تشخيص وعلاج مُتلازِمة المِبيَض مُتعدِّد التكيُّسات لدى النساء: دراسة سريرية واستطلاعية

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الملخص

يهدف البحث إلى التعرف على تشخيص أسباب ومعالجة متلازمة تكيس المبايض لدى النساء. تم فحص وتشخيص 123 امرأة عن طريق التحاليل المعملية الطبية وجهاز تصوير فوق الصوتية، وكذلك تم تصميم استبانة موجهة لعدد 25 طبياً متخصصاً للإجابة عن علامات وتشخيص أسباب والطرق المعتمدة لعلاج متلازمة تكيُس المبايض اعتماداً على ممارستهم وخبراتهم العملية. ولتحليل البيانات تم استخدام برنامج الرزمة الإحصائية للعلوم الاجتماعية (SPSS :V24) لتحليل البيانات. بينت الدراسة السريرية أن 37% من النساء المصابات بتكيس المبايض يتراوح أعمارهن ما بين (من 20 سنة إلى أقل من 40 سنة)، وأن النساء المصابات بتكيس المبايض يزيد وزنهم على 655 كجم. وكشفت الدراسة أن المصابات بداء السكري هم أكثرهن إصابة بتكيس المبايض بنسبة (29%)، يليها المصابات بأمراض القلب بنسبة (18%)، يليها المصابات بأمراض الضغط بنسبة (15%)، يليها المصابات بالربو بنسبة (8%)، يليها المصابات بفقر الدم بنسبة (7%). إن عدم انتظام الدورة الشهرية، ظهور حب الشباب، ظهور الشعر على الوجه والصدر، البقع السوداء وسماكة الجلد، سقوط الشعر هي من أهم علامات تكيس المبايض بنسبة (60%). كما إن اختلال وظائف الهرمونات، مقاومة الأنسولين، الوراثة، الالتهابات، فرط الأندروجينية، انقطاع الإباضة، والعقم تعد الأسباب الرئيسية لعلامات تكيس المبايض. وكشفت الدراسة أن السكري التراكمي، البرولاكتين، هرمون LH، وهرمون FH، التستوستيرون، والأستروجين تعد أهم الطرق الشائعة لتشخيص حالات تكيس المبايض. وأشارت الدراسة إلى أن تعديل أسلوب الحياة، العلاج الدوائي، وتقنية الإنجاب المساعدة ART، والدعم النفسي هي الطرق المعتمدة من قبل أخصائي أمراض النساء والولادة بنسبة (72%).

الكلمات المفتاحية: متلازمة المبيض، تكيُس المبايض، التشخيص، الأسباب، العلاج.

Introduction:

The disorder polycystic ovarian syndrome (PCOS), which is one of the most common to affect women, has numerous unidentified causes. The excessive production of androgens, largely by the ovaries, along with insulin resistance, is known to cause this syndrome, which is a diverse illness [1].

The majority of women go through menopause, and the metabolic problems in Polycystic Ovary Syndrome may raise the risk of cardiovascular disease [2, 3]. Both men and women of reproductive age can be significantly impacted by a group of symptoms linked to the hormonal imbalance known as PCOS. It includes several androgen excess symptoms [4]. Insulin resistance, hyperinsulinemia, and weight gain are all symptoms of polycystic ovarian syndrome, and they all significantly contribute to the rise in androgens [5]. Insulin resistance, coupled with hyperinsulinemia and weight gain, are features of polycystic ovarian syndrome, and they significantly contribute to the rise in androgens [2, 6]. Women's irregular menstrual cycles, together with hyperanrdogenism and specific pelvic ultrasound findings, are what set polycystic ovarian syndrome apart. Obesity, poor metabolism, and infertility are common in women, which raises their long-term risk of cardiovascular disease and pregnancy difficulties [7]. Because of the complexity, interconnectedness, and multidimensional nature of this illness, the diagnosis is made by identifying its symptoms after excluding out known disorders that impact ovulation or hyperanrdogenism [8]. Diabetes and cardiovascular disease are made more likely by polycystic ovarian syndrome. Infertility, irregular menstruation, hyperanrdogenism, insulin resistance, abnormal glucose tolerance, and a risk of developing type 2 diabetes are all significant effects of polycystic ovarian syndrome, which affects approximately 6 – 15% of women of childbearing age [8]. Despite the fact that the exact etiology of polycystic ovarian syndrome is unknown, there are a few likely culprits, such as inherited genes from parents or even ancestors. Though not as much as men, women with polycystic ovarian syndrome are more prone to baldness due to facial acne, hair loss, and thinning of the scalp [9]. Irregular or nonexistent menstrual cycles are just one of the symptoms that can result from polycystic ovarian syndrome, a hormonal disease, and other symptoms such as: weight gain, especially around the waist, infertility, acne, excessive body, facial hair, skin tags, and darkening of the skin [10].

Methods

Study design and data collection

A case study was conducted at Al–Yasamin Hospital, Zliten, Libya during the year 2023, with data collected from the files of the patient's database. One hundred and twenty - three patients (123 with polycystic ovarian syndrome were diagnosed by both Medical Laboratory tests and ultrasound image machines. The following data was obtained such as age, weight, and history of previous chronic diseases. Moreover, a questionnaire was designed; which consists of three dimensions related to methods to diagnose women with polycystic ovarian syndrome, symptoms of polycystic ovarian syndrome, Causes of polycystic ovarian syndrome, and Approved Treatment methods for polycystic ovarian syndrome. The questionnaire was distributed to twenty-five specialized obstetricians and gynecologists to answer the questionnaire questions based on their practicing and practical experience. The data was analyzed using the Statistical Program for Social Sciences (SPSS version 24). Descriptive statistics were used and all results are presented as frequencies, means standard ± deviation and percentages.

Statistical Analysis of Data

Statistical analysis of the data was achieved using Excel program and all quantitative variables were analyzed using Statistical Package for Social Sciences (SPSS) version 24. All quantitative variables were examined for normality by Kolmogorov-Smirnov test before analysis. Continuous variables were presented as mean and standard deviations. Differences between proportions were considered statistically significant if (95%) . This study is ethically approved from Khoms Medicine Faculty, University of Elmergib and Al-Yasamin Hospital, Zliten, Libya.

Results

This a cross-sectional study designed to identify The Causes of Women's polycystic ovary syndrome and methods of treatment. A set of diagnosis procedures such as laboratory tests and ultrasound image machines were carried out to diagnose 123 women, who were selected randomly at Zliten Al–Yasamin Hospital. Moreover, a questionnaire survey was conducted to twenty – five specialized obstetricians and gynecologists to answer the questions regarding the causes and treatments of women with polycystic ovary syndrome. Figure (1) indicated that the patient's ages ranged from (20 to less than 30 years) were the higher percentage (45%), then the ages from (30 to less than 40 years) were the second higher percent (28%), followed by the ages who were less than 20 years, with a percent (17%), then the least patient's ages were for the ages ranged (over 40 years), with a percent (17%). The study illustrated that most women with ovary syndrome and methods of treatment ranged from (20 to less than 40 years).
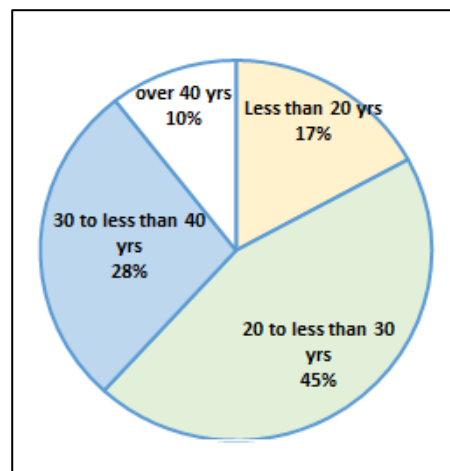

Figure 1 Age distribution of the patients.

As in Table (1), the weights of the patients were documented, the patients' weights ranged from (65 to less than 75kg) were higher weights (41%), the second higher weights were ranged from (50 to less than 65 kg) with (29%), followed by the weights ranged from (50 to less than 65 kg) with (29%), followed by the ages over 75 kg with (18%), then the least patient's weights who were (less 50 kg, with (11%). The study discovered that the women with polycystic ovary syndrome were found at weights ranged from (over 65 kg).

Table 1. Weight distribution of the patients.

No.	Weight	Frequency	Percentage (%)
1.	Less 50 kg	14	11%
2.	50 to less than 65 kg	36	29%
3.	65 to less than 75 kg	51	41%
4.	over 75 kg	22	18%
Total		**123**	**100%**

Table (2) shows the patient history: chronic diseases of the patients, the study indicated that diabetic patients were the higher percent of women with polycystic ovary syndrome compared with other diseases with (29%), women with HTN were the second higher women with polycystic ovary syndrome (15%), the third rate for women with heart diseases (18%), followed by women with ASTHMA diseases with (8%), followed by the women with ANEMIA diseases (7%).

Table 2. Patient history: Chronic diseases.

No.	Chronic disease	Frequency	Percentage (%)
1.	HTN	19	15%
2.	D.M	36	29%
3.	ASTHMA	10	8%
4.	ANEMIA	8	7%
5.	Heart diseases	22	18%
Total		**123**	**100%**

Five-point Likert scale was adopted to answer the questions of the questionnaire, considering the following scales for answering the questionnaire as following (0.8. – 1.59) is very low, (2.60. – 3.39) is low, (3.40 – 4.19) is high, (4.20 – 5.00) is very high. The reliability of the questionnaire was measured using Cronbach Alpha test and Cronbach Alpha Was found to be (0.867) which means the tool has a bog value of reliability.

Table 3. Methods to Diagnose women with polycystic ovarian syndrome.

No	Dimension	Mean	Sd. Deviation	Estimation	Rank
1.	HBA1C: Cumulative Sugar	3.24	0.786	Medium	6
2.	Prolactin	4.89	0.483	Very High	1
3.	LH: Luteinizing hormone	4.87	0.561	Very High	2
4.	FH: Follicle-stimulating hormone	4.51	0.499	Very High	3
5.	Testosterone	3.55	0..861	high	4
6.	Estrogens	3.41	0.784	high	5
Average		4.08	0.620		

It is noted from Table (3) that the general arithmetic average of the phrase of the (Methods to diagnosis women with polycystic ovarian syndrome dimension was high, with an average of 4.08 and the standard deviation was 0.620 < 1, which means all the respondents have the same direction of agreement towards the answers of this dimension. (The prolactin test) was ranked the first method to diagnose polycystic ovarian syndrome with an average (of 4.89) and an estimation (very high), the second highest phrase was for the phrase (LH: Luteinizing hormone) with an average (of 4.87), which means the use of the type analysis was also (very high). The least utilization of the medical analyses was for the phrase (HBA1C: Cumulative Sugar), with an average (3.24), which means the respondents' answers were (Medium).

According to table analysis no. (4), the general arithmetic average of the dimension (symptoms of PCOS) was found to be (3.41), which means the respondents answered with (high) on these symptoms. The standard deviation for all phrases was 0.730 < 1, which means all the respondents have the same direction regarding the answers of this dimension. (Irregular menstrual periods) was ranked as the first symptom of polycystic ovarian syndrome with an average (of 3.84) and an estimation (high), the second highest phrase, was the phrase (Appearance of acne) with an average (of 3.69), which means the symptoms of polycystic ovarian syndrome was also (very high). The last symptoms of polycystic ovarian syndrome were for the phrase (Oily skin), with an average (of 2.71), which means the respondents answered with (Medium).

Table 4. Systems of polycystic ovarian syndrome

No	Dimension	Mean	Sd. Deviation	Estimation	Rank
1.	Appearance of acne.	3.69	0.685	high	2
2.	Oily skin.	2.71	0.753	Medium	10
3.	Increased hair growth on the face, chest, or thighs.	3.51	0.684	High	5
4.	Dark spots and thickening of the skin.	3.32	0.689	Medium	7
5.	especially in the neck and armpits.	3.55	0.841	high	3
6.	Head hair loss.	3.41	0.637	high	6
7.	hair on the face and body.	3.25	0.764	Medium	9
8.	Overweight.	3.28	0.681	Medium	8
9.	irregular menstrual periods.	3.84	0.762	high	1
10.	infertility.	3.41	0.761	high	3
Average		**3.41**	**0.730**	high	

Figure (2) indicates the seven pillars regarding the causes of the polycystic ovarian syndrome, the higher cause recorded according to respondents (specialized obstetricians and gynecologists) point of view are several reasons,

mainly due to hormonal imbalances with (99%), insulin resistance with (96%), and the other reasons were having different percentages as seen in the figure (2).
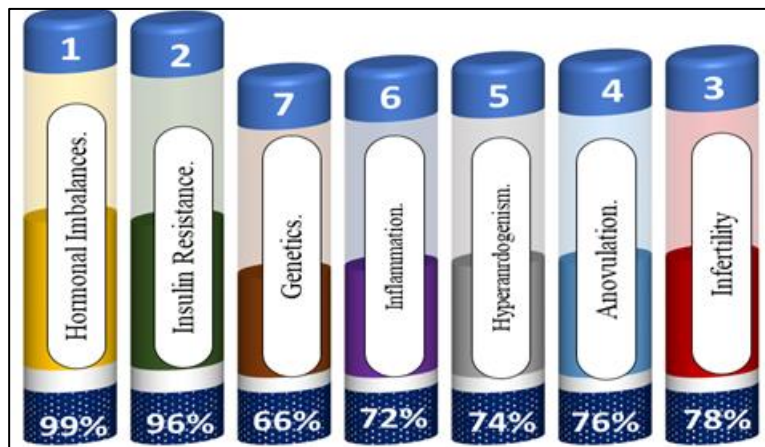

Figure 2 Causes of polycystic ovarian syndrome.

Figure (3) illustrates the most Approved treatment methods of the polycystic ovarian syndrome from specialized obstetricians and gynecologists points of view:
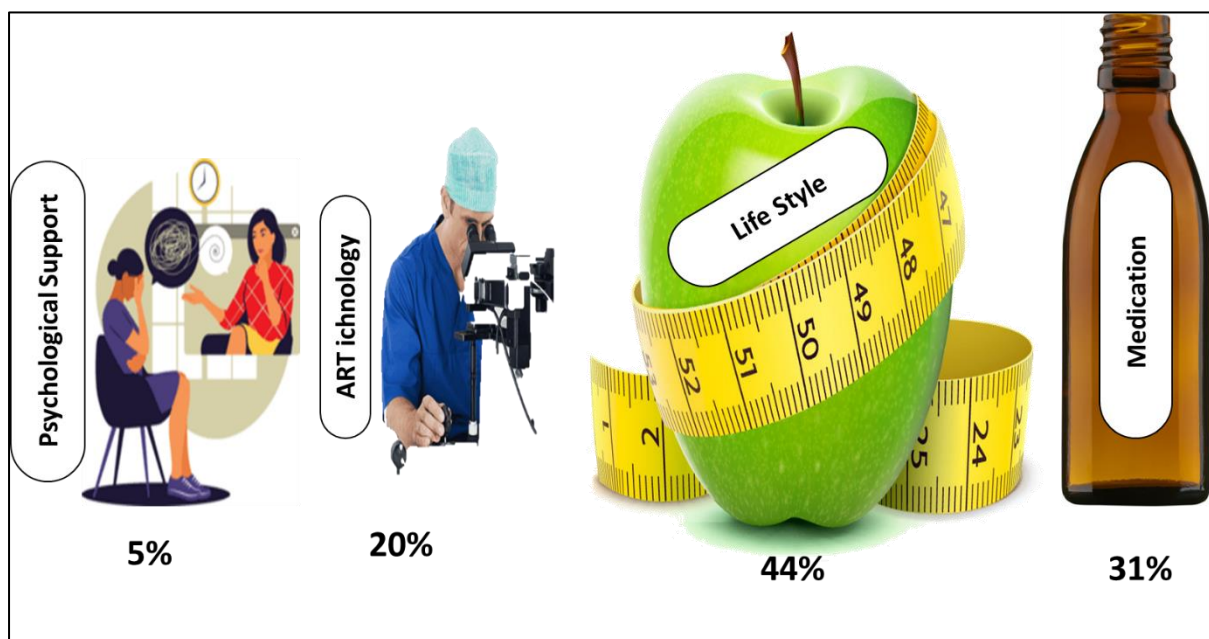

Figure 3 Approved treatment methods for polycystic ovarian syndrome.

The figure shown above indicated 4 main methods for treatment, Doctors see that lifestyle is the most important method of treatment (44%), including Weight management. Losing weight can help improve insulin sensitivity, regulate menstrual cycles, and reduce androgen levels. Dietary changes focus on consuming a balanced diet that includes whole foods, lean proteins, fruits, vegetables, and healthy fats. It is recommended to limit processed foods, sugary snacks, and beverages. Regular exercise plays a crucial role in managing polycystic ovarian syndrome. Engaging in aerobic exercises, such as brisk walking, cycling, or swimming, for at least 150 minutes per week can help improve insulin sensitivity and promote weight loss. The next method of treatment was medication, with (31%) birth control pills commonly prescribed to regulate menstrual cycles and reduce androgen levels. They contain hormones that suppress ovulation and help balance hormone levels. Anti-androgen medications, such as spironolactone or flutamide, can be used to block the effects of androgens. They help manage symptoms like acne, hirsutism, and hair loss. Metformin, originally used to treat type 2 diabetes, is often prescribed to women with polycystic ovarian syndrome who have insulin resistance. It helps lower insulin levels and improve insulin sensitivity, which can positively impact hormone balance and menstrual regularity. The third method the treatment was Assisted Reproductive Technology (ART) with (20%). In vitro fertilization (IVF) may

be recommended for women with polycystic ovarian syndrome who have difficulty conceiving naturally. IVF involves stimulating the ovaries to produce multiple eggs, retrieving the eggs, fertilizing them with sperm in a laboratory, and transferring the resulting embryos into the uterus. Psychological support is also crucial for managing the emotional and psychological aspects of polycystic ovarian syndrome. PCOS can have a significant impact on mental health, body image, self-esteem, and overall quality of life. Seeking support from therapists, counselors, or support groups can provide valuable emotional support and coping strategies.

discussion:

Polycystic Ovary Syndrome (PCOS) is a common hormonal disorder that affects women of reproductive age. It is characterized by a combination of symptoms, including irregular menstrual cycles, excess androgen levels (male hormones), and the presence of small cysts on the ovaries. PCOS can have various impacts on a woman's health, fertility, and overall well-being. Several studies have been conducted to identify the causes of polycystic ovarian syndrome and methods of study. Understanding the ovulation process, the menstrual cycle, and the function of several hormones is necessary to comprehend the symptoms of PCOS. The average menstrual cycle lasts between 24 and 35 days, and it involves the development of the egg, its release from the ovary, and the preparation of the uterus for the reception and sustenance of the embryo. The menstrual cycle regulates the body's hormone levels, which fluctuate on a monthly basis throughout reproductive life. An egg is prepared for release by follicle stimulating hormone (FSH), which is released by the pituitary gland at the base of the brain when the cycle is healthy. FSH promotes the growth of a follicle with a diameter of 2 cm from the fluid-like sac that surrounds the egg [13].

Around two weeks prior to the cycle in which the egg is at a ready stage, the pituitary gland releases a hormone (LH) that prompts the follicle to release one egg into the fallopian tube, a process known as ovulation.

The fertile phase of a woman's menstrual cycle is called ovulation. The ovaries also emit modest amounts of androgens (male hormones), such as testosterone, which is turned into estrogen, as well as other hormones like progesterone and estrogen to thicken the lining of the uterus and prepare it for pregnancy at this time [7].

PCOS investigations include a general physical exam, pelvic ultrasound, blood test and family history, and this disease is usually misdiagnosed or misunderstood with other disorders. Since then, a number of diagnostic criteria have been put out, each of which varies from menopause to Hyperanrdogenism to ovarian morphological alterations that may be seen by pelvic ultrasound. In addition to obesity, menopause, and enlarged bilateral ovaries that showed up as numerous cysts, a group of seven women was the first to be diagnosed with what is now known as PCOS by Stein and Leventhal in 1935 [14].

Conclusions:

Polycystic Ovary Syndrome (PCOS) is a common hormonal disorder that affects women of reproductive age. It is characterized by a combination of symptoms, including irregular menstrual cycles, excess androgen levels (male hormones), and the presence of small cysts on the ovaries. PCOS can have various impacts on a woman's health, fertility, and overall well-being. The study aimed to identify the methods of diagnosis and treatment of the causes of women's polycystic ovary syndrome: Clinical and prospective study. One hundred and twenty – three women were medically diagnosed by both medical laboratory tests and ultrasound image machines. Moreover, a questionnaire was designed to question 25 specialized obstetricians and gynecologists to provide answers based on their practicing and experience, regarding the methods of diagnosis, symptoms of polycystic ovary syndrome, causes and approved treatment methods for women with polycystic ovary syndrome.

1. The study concluded that 37% of the women with polycystic ovary syndrome aged from (20 to less than 40 years).
2. 59% of the women with polycystic ovary syndrome were found at weights ranging from (over 65 kg).
3. The diabetic patients (DN) were the higher percent of women with Polycystic Ovary Syndrome (29%), followed by women with heart diseases (18%), followed by women with HTN (15%), followed by women with ASTHMA diseases (8%), followed by the women with ANEMIA diseases (7%).
4. An irregular menstrual period, the appearance of acne, especially in the neck and armpits, oily skin, increased hair growth on the face, chest, or thighs, dark spots and thickening of the skin, head hair loss, hair on the face and body, overweight, and density hair on the face and body infertility are the main symptoms of polycystic ovary syndrome with (68%).
5. The hormonal imbalances, insulin resistance, genetics, inflammation, hyperanrdogenism, anovulation, and infertility are the root causes of polycystic ovary syndrome (80%). HBA1C: cumulative sugar, prolactin, luteinizing hormone (LH), follicle-stimulating hormone (FH), testosterone, and estrogens are the core methods to diagnose women with polycystic ovarian syndrome.
6. Lifestyle, medication, Assisted Reproductive Technology (ART), and psychological support were approved by the experts in this field as the main methods of polycystic ovary syndrome treatment (72%).

Recommendations:

1. Maintaining a healthy weight or achieving weight loss if overweight or obese.
2. Adopting a balanced diet that includes whole foods, such as fruits, vegetables, whole grains, lean proteins, and healthy fats.
3. Engaging in regular physical activity, such as aerobic exercises and strength training.
4. Birth control pills that contain both estrogen and progestin are commonly prescribed to regulate menstrual cycles, reduce androgen levels, and alleviate symptoms such as acne and hirsutism.
5. Medications like spironolactone or flutamide may be prescribed to block the effects of androgens, helping to manage symptoms like excess hair growth and acne.
6. Metformin, typically used to treat type 2 diabetes, can be prescribed to improve insulin sensitivity and regulate menstrual cycles in women with PCOS who have insulin resistance.
7. For women trying to conceive, fertility medications such as clomiphene citrate or letrozole may be recommended to stimulate ovulation and increase the chances of pregnancy.
8. In cases where other treatments have not been successful, procedures like in vitro fertilization (IVF) may be considered. IVF involves fertilizing eggs with sperm in a laboratory and transferring resulting embryos to the uterus.
9. It's recommended that women with PCOS consult with a healthcare professional specializing in reproductive endocrinology or gynecology to develop a personalized treatment plan.
10. Regular follow-up appointments are essential to monitor progress, adjust treatments if necessary, and address any new concerns. With proper management and support, women with PCOS can effectively manage their condition and improve their quality of life.

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