

**CASE STUDY ON: ADVERSE EFFECT OF DRUGS USED IN
TREATMENT OF POLYCYSTIC OVARIAN SYNDROME (PCOS)**

**Akash S. Kapse¹, Abhijit N. Daf^{2*}, Roshankumar G. Satsure³, Dr. Prasad P. Jumade⁴,
Dr. Dinesh S. Wanjari⁵**

¹*Department of Pharmacology, ^{2,4,5}*Pharmaceutical Chemistry, ³*Pharmaceutics of Agnihotri
Institute of Pharmacy, Wardha and Agnihotri College of Pharmacy, Wardha, (MS) India-
442001.

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***Corresponding Author**

Abhijit N. Daf

Pharmaceutical Chemistry,
Wardha and Agnihotri
College of Pharmacy,
Wardha, (MS) India-
442001.

ABSTRACT

PCOS, also known as polycystic ovary syndrome, can afflict any woman who is of reproductive age. Women with this frequent hormonal condition create higher levels of masculine hormones than normal. It may impact up to 10% of these women. The hormones utilized for sex differ, which regulates a healthy menstrual cycle but causes issues with a woman's ovaries. Finding the ratio of adverse drug reactions in several PCOS patients was the goal of the current investigation. With the patients' prior consent, a survey consisting of sixteen questions was created and conducted across many hospitals. It was found that women often experience health problems as a result of PCOS, or polycystic ovarian syndrome, an endocrine condition. Chronic PCOS initially presents as reproductive and physiological problems, but over time it progresses to greater metabolic difficulties and infertility. Visual disturbance, skin problems, stomach trouble,

multiple gestations, and breast pain are common side effects that can potentially impact a person's lifestyle. Ultimately, our study which comprised a representative sample of the PCOS population shows no noteworthy side effects from PCOS medications, unless they are taken long-term. We discovered that women who use certain drugs have an increased risk of depression, multiple gestations, anorexia, heart failure, and osteoporosis. Further study and research on this topic are required.

KEYWORDS: The hormones utilized for sex differ, which regulates a healthy menstrual

cycle but causes issues with a woman's ovaries.

1. INTRODUCTION

These days, Polycystic Ovarian Syndrome (PCOS, Heterogeneous Disorder) is the subject of so much discussions that it's become difficult to determine how certain the situations that have already been reported actually are. Small cysts on the skin represent a complex issue. There are many symptoms of the illness that are difficult to differentiate or maybe very similar to symptoms of other illnesses, such as PMS (Premenstrual syndrome), menstruation, or a range of psychiatric illnesses.^[1,2] As per WHO, there are 8-13 % of the population have been affected by PCOS whereas 70% of population is still undiagnosed. All women of reproductive age may be affected by Polycystic Ovary Syndrome, or PCOS. This common hormonal disorder causes women to produce more male hormones than usual. Up to 10% of these women may be affected difference in the hormones used for sex manages a healthy menstrual cycle but produces complications in a woman's ovaries. In accordance with the fact that women with PCOS typically experience irregular periods and have difficulties becoming pregnant. Apart from being the primary factor leading to infertility, irregular periods are also responsible for the growth of tiny, fluid- filled sacs known as cysts in the ovaries. Only to find out later that they have PCOS after gaining a lot of weight or going through a difficult period getting a baby.^[2, 3]

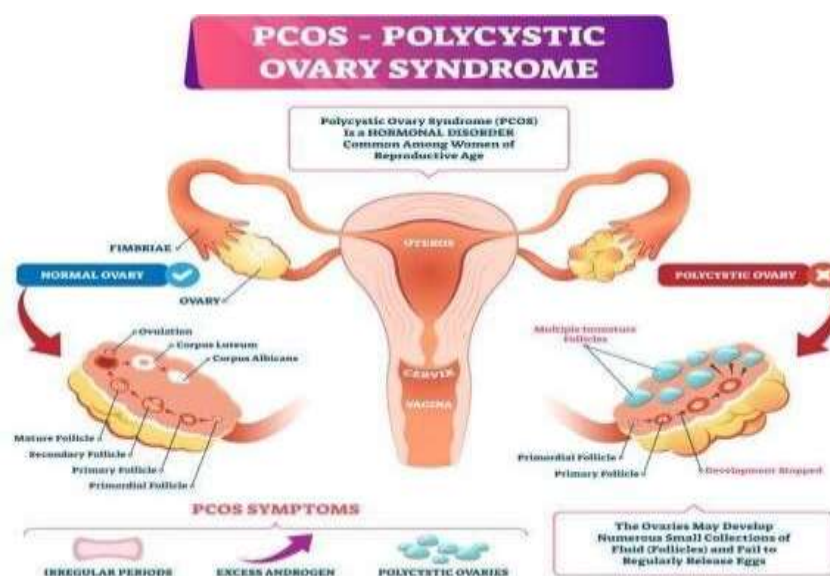


Fig. 1: Pathophysiology of PCOS.

2. Symptoms

During puberty, during the menarche period, signs and symptoms of PCOS often appear.

Periodically, after acquiring a significant amount of weight or experiencing difficulty conceiving, they discover that they have PCOS. Different PCOS symptoms can be present. Typical PCOS symptoms consist of.

- Heavy bleeding during menstruation: Amidst the border of the uterus takes longer than usual to expand, it is to be expected that you will have massive bleeding than normal.
- Inconsistent Periods (or none at all): The lack of ovulation prevented the uterine border from being destroyed every two months. Some women may get their period only once a year, while others may not receive their period.
- Overgrowth of Body Hair: Due to an abundance of male hormones, PCOS-affected women often to be experience in hirsutism, or excessive facial and body hair development.
- Hormonal acne: The overproduction of oil that is caused by male hormones likely manifest as acne on your upper back and face.
- Hair Loss/Thinning: While body hair grows excessively, your scalp's hair begin to lose weight again, as a result of all those masculine hormones.
- Headaches: Women who experience a variety of hormonal shifts experience from PCOS which can set off headaches.
- Dark Complexioned Skin: It is not atypical to notice dark patches of skin in women who have PCOS especially on the neck, groin, and under the breasts.
- Polycystic ovaries. Your ovaries might be expanded and accommodate follicles that surround the egg. Further the ovaries might fail to work consistently.^[3, 4, 5]

3. Types of PCOS

About 70% of patients suffer with Insulin Resistant PCOS, which is the most common kind of PCOS. The main cause of insulin resistance is when the body's insulin levels are higher than normal referred to as hyperinsulinemia. PCOS after taking medication many people who quit taking the oral contraceptive pill develop post-pill PCOS. Given that oral contraceptives like Ginnet, Yasmin, and Yaz are synthetic progestogens, often included in this particular kind of PCOS. Following a pill cessation, your ovaries mostly a party might cause an increase in androgens, which can result in symptoms similar to PCOS. Despite this type do not exhibiting insulin resistance.

About 10% of people with PCOS are diagnosed with adrenal PCOS, which is caused by an unusual stress response. Unfortunately, testing for this form of androgen is not routinely done unless you see an endocrinologist or other specialist. Inflammatory PCOS: Prolonged pain

stimulates the ovaries to create an excess of testosterone, which results in symptoms and ovulation problems. This kind of PCOS is characterized by inflammation-related symptoms such as migraine, joint pain, unexplained fatigue, dermatitis, and gastrointestinal issues like irritable bowel syndrome.^[6, 7, 8]

4. Diagnosis

PCOS cannot be definitively diagnosed with a test. The patient's medical history, including her menstrual cycles and weight fluctuations, will probably be covered first by the doctor. A physical examination will involve looking for indications of acne, insulin resistance and excessive hair growth.

The doctor might then advise.

A pelvic examination. Your reproductive organs are examined by the doctor both manually and visually for growth, or other anomalies lumps, blood examinations. It is possible to measure the quantities of hormones in your blood. Through testing, potential causes of irregular menstruation or androgen excess that resembles PCOS can be ruled out. Further blood testing to assess your fasting cholesterol and triglyceride levels as well as your glucose tolerance may be necessary.

An ultrasound (USG). Your doctor checks the appearance of your ovaries and the thickness of the lining of your uterus. A wand-like device (transducer) is placed in your vagina (transvaginal ultrasound). The transducer emits sound waves that are translated into images on a computer screen. If a patient has a diagnosis of PCOS, then the doctor might recommend additional tests for complications.

Fasting For the glucose level test, you would have to abstain from eating and drinking for at least eight hours. These tests may consist of routine measurements of blood pressure, glucose tolerance, triglyceride and cholesterol levels. Anxiety and depression screening. Obstructive sleep apnea screening can be utilized.^[8, 9, 10]

5. Treatment

Managing each patient's unique issues, such as obesity, acne, hirsutism, or infertility, is the main goal of PCOS treatment. Medication or dietary adjustments may be part of a specific treatment plan. Modifications to lifestyle, A low-calorie diet along with modest exercise may be suggested by a doctor to help patients lose weight. Even a small weight loss, like five

percent of your body weight, could help you feel better. In addition to helping with infertility, losing weight may improve the efficacy of PCOS drugs prescribed by doctors.

Your doctor may advise combination of birth control pills to control the menstrual period. Progestin-androgen- containing pills control estrogen levels and reduce the synthesis of testosterone. In addition to treating irregular bleeding, excessive hair growth, and acne, hormone regulation can reduce your risk of endometrial cancer. The use of progestin periods can be regulated and endometrial cancer can be prevented by taking progestin for 10 to 14 days every one to two months. Both testosterone levels and pregnancy prevention are not achieved by progestin medication. Your doctor may suggest Clomifene to aid with your ovulation process. During the initial phase of your menstrual cycle, this oral anti-estrogen drug works.

Use of Femara or letrozole the ovaries may be stimulated by this medication for breast cancer. Metformin oral treatment for type 2 diabetes decreases insulin levels and increases insulin resistance. Metformin can assist people with prediabetes lose weight and slow the onset of type 2 diabetes. Gonadotropins hormone treatments are administered intravenously. Your doctor may suggest the following to lessen excessive hair growth: birth control tablets. These tablets reduce the androgen production that might lead to an overabundance of hair growth. Salicylic acid prevents testosterone from having an adverse effect on the skin. Vanique lotion can help women's facial hair grow more slowly.^[11,12,13]

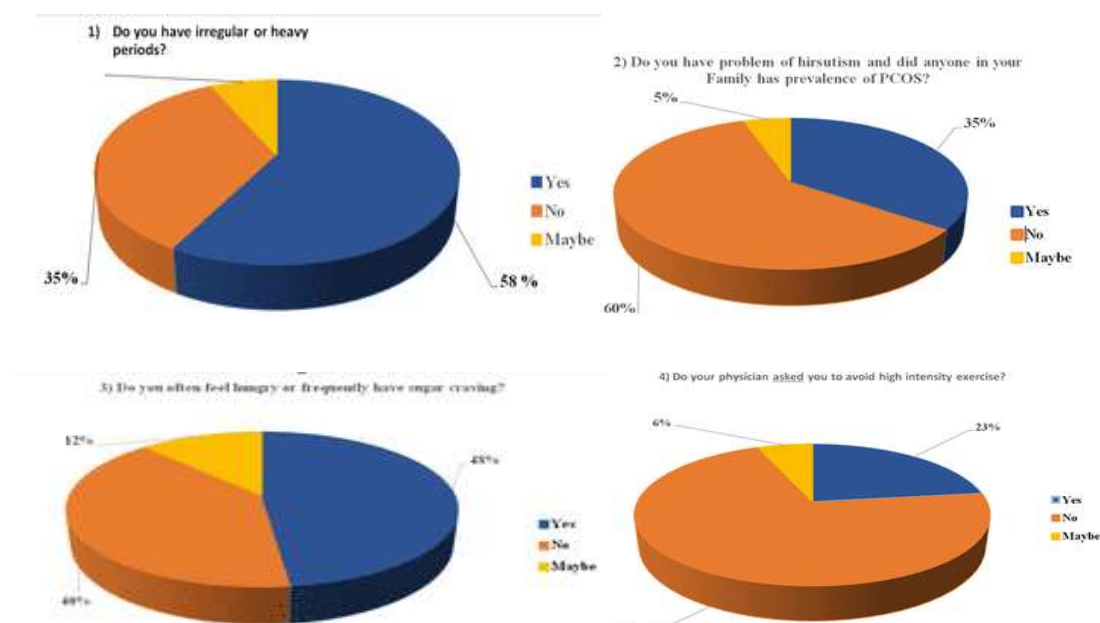
The present study was aimed to find adverse effect of drugs used in treatment of polycystic ovarian syndrome (PCOS). The principle objective of the study was to identify adverse effect of drug used in PCOS by using questionnaire and interpretation of data from the questionnaire.

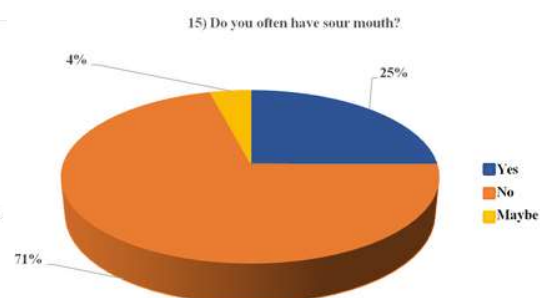
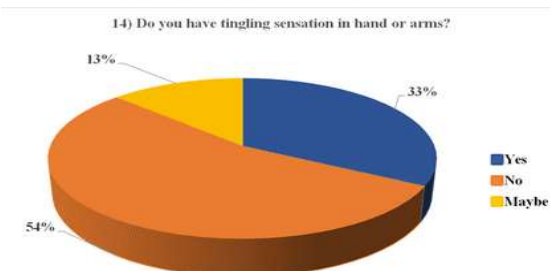
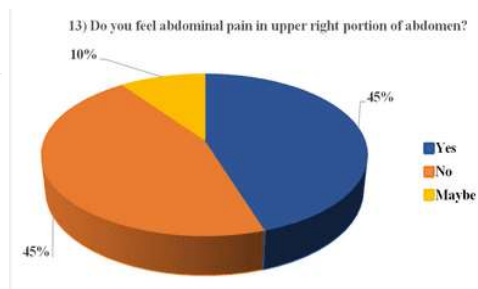
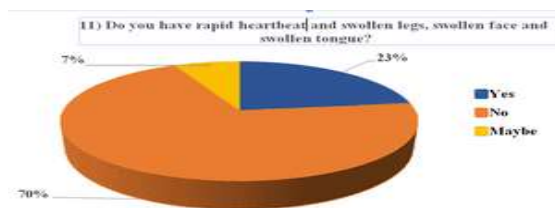
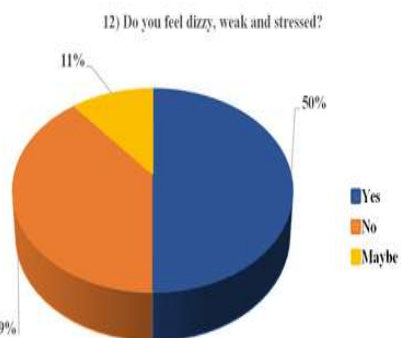
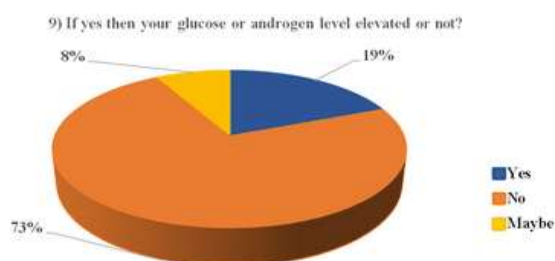
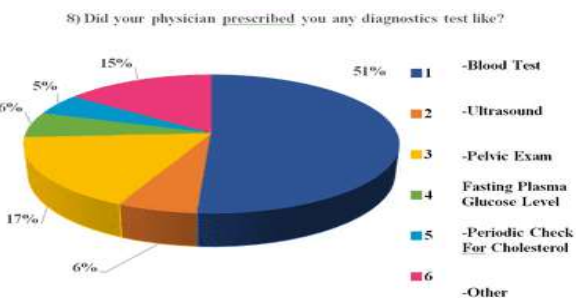
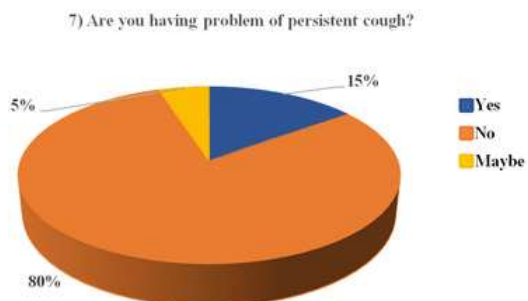
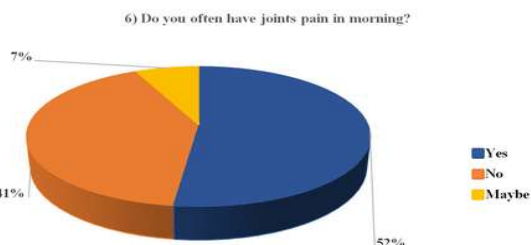
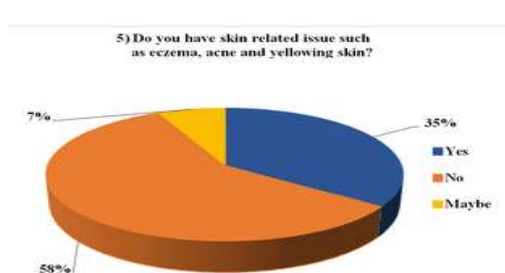
Places of study were Dr. Lokhnde Sanjiwini Hospital, Wardha, Dr. Gharote Hospital, Wardha and Datta Meghe Institute of Medical Sciences Hospital, Wardha. Study Design was Case control study and ample size was 100 patients. All patients were recruited from outpatient department of hospital. The questionnaire was prepared in vernacular languages i.e. Marathi, Hindi & English with 16 MCQs in 100 patients.

The following questionnaire after review of existing literature was prepared with 16 questions and the case study was done with prior consent from patients.

- 1) Do you have irregular or heavy period?
- 2) Do you have problem of hirsutism and did anyone in your family have prevalence of PCOS?
- 3) Do you often feel hungry or frequently have sugar craving?
- 4) Did your physician ask you to avoid high intensity exercise?
- 5) Do you have skin related issue such as eczema, acne and yellowing of skin?
- 6) Do you often have joint pain or migraine?
- 7) Are you having problem of persistent cough?
- 8) Did your physician prescribed you any diagnostic test like blood test/pelvic exam, fasting and post meal glucose test or any other?
- 9) If yes then your glucose or androgen level elevated or not?
- 10) From how many years you are taking treatment related to PCOS?
- 11) Do you have rapid heartbeat and swollen legs, swollen face and swollen tongue?
- 12) Do you frequently feel dizzy, weak and stressed?
- 13) Do you feel abdominal pain in upper right portion of abdomen?
- 14) Do you have tingling sensation in hand or arms?
- 15) Do you often have sore mouth?
- 16) Did you feel any changes in your vision, speech and mood?

6. RESULTS





7. Statistical Interpretation of Data

CASE	CONTROL	CAUSES	DRUG	ADVERSE DRUG REACTION
58%	35%	Irregular periods leads to hormonal Imbalance	Clomifene Gonadotropin	Multiple gestation, Thromboembolism, Visual disturbance, Injection site Reaction.
			Antiandrogen	Affect kidney Function, Hypotension.
35%	60%	Virallization (Voice changes, Baldness)	Antiandrogen	Hypotension Hyperkalemia Increase internal Menstrual bleeding.
48%	40%	Increase in insulin level	Insulin sensitizing agent	G.I. upset Hepatotoxicity, CHF, Increase in Homocystine level.
23%	71%	Increase in stress, insulin, Androgen level	Insulin sensitizing agent	Hepatotoxicity, CHF, Increase in Homocystine level,
			Antiandrogen	G.I. upset
				Hypotension,
				Hyperkalemia,
				Increase internal
				Bleeding.
35%	58%	Hormonal imbalance- Increase in androgen level	Spiranolactone	Hyperkalemia Hypotension Increase internal bleeding breast tenderness
52%	41%	Severe pain in joints	NSAID	Thrombocytopenia Leucopenia Hepatotoxicity
15%	80%		Centrally acting appetite suppressants like sibutramine	Headache Cough (Blood in sputum)
51%	-	Hormonal imbalance	Clomifene	Multiple gestation, Visual disturbance
6%	-	Ovarian cyst	Gonadotropin	Memory problem,
				Bone loss
17%	-	Thick endometrial wall	Antiandrogen	Hypotension, Hyperkalemia
6%	-	Inadequate Insulin level	Insulin sensitizing agent	Hepatotoxicity, CHF, Increase in Homocystine level
5%	-	Increase cholesterol level	Oral contraceptive	Induced liver damage Cancer incidence Thromboembolic event
19%	73%	Decrease insulin and Increase androgen level	Insulin sensitizing agent- Metformin pioglitazone, rosiglitazone, acarbose Antiandrogen desogestrol	Anorexia, lactic acidosis, Hepatotoxicity CHF, Edema, Thromboembolism, Stroke, Myocardial infarction
46%	-	Insulin resistance	Insulin	Hepatotoxicity Increase risk for

		Hyperandrogenis m	ensitizingagent Antiandrogen	cardiovascular disease
23%	70%	Insulin resistance	Drug-insulin sensitizingagent- pioglitazone centrallyacting appetite Suppresant- sibutramine	CHF, Edema, Increasein LDL with rosiglitazone Hypertension
50%	39%	High intensityexercise Insulinresistance	Metformin, pioglitazone, rosiglitazone, acarbose	Anorexia , lactic acidosis, cardiovascular disease
45%	45%	Ovarian cyst	Hormonal Therapy	Memory problem,Weight gain, Bone lossand Higherrisk for fracture
54%	33%	Interferewith absorptionofvitaminB12	Metformin	Anorexia, Permanent neurologicalandnervedamage
25%	71%	Increasedlevelof cholesterol	Ora Contraceptive	Induced liver damage,Cancer incidence, Thromboembolic Event
34%	58%	Hormonal imbalance	Clomiphene Metformin	Visualdisturbance Mood swings

8. DISCUSSION

These days, PCOS, also known as polycystic ovarian syndrome, is a highly prevalent endocrine condition that affects women's health. PCOS is a long-term medical disorder that initially presents as reproductive and physiological problems, but eventually leads to increased metabolic abnormalities and infertility. Common side effects that can also impact a person's way of life include breast soreness, multiple gestations, gastrointestinal trouble, skin problems, and visual disruption. This Case Study makes it abundantly evident that every drug used to treat PCOS has a number of negative side effects, such as hirsutism or infertility. Severe bleeding during the menstrual cycle: Because the uterine barrier takes longer than typical to stretch, you should anticipate bleeding more heavily than usual. Periods that are inconsistent, or none at all: The present study was initiated with the aim to know about the adverse drug reactions due to PCOS treatment and we revealed that from the survey questionnaire with prior consent from hospitals and patients. The questionnaire was prepared in vernacular languages i.e. Marathi, Hindi & English with 16 MCQs in 100 patients. The ratio we found after the study was 58% of the patients were having irregular or heavy menstruation and 35% were having no worries in the same whereas 7% patients were unaware about the same. When we assessed about hirsutism or genetic history 60% patients

were not having any such symptoms or history. Sugar craving and hunger was 50-50% due to PCOS. When we asked about their Physician's opinion for avoiding intensive exercise, it was little bit less because the patients were of younger age but their Physician had suggested them to check regularly for blood test and pelvic examination. Joints pain and Migraine was found in about 50% of patients and prophylactic treatment they are taking. Rapid Heartbeat, swollen legs & face was observed in less number of patients but dizziness and stressed feeling were there in almost half of the study cases. Right abdominal heavy pain was found in most of patients whereas there was no significance in feeling tingling or sore throat but blurred vision as per demographics patients below the age of 30 was highly significant. The study finally revealed that there are several ADRs due to PCOS treatment and an innovative approach is required for the treatment and management of PCOS.

9. Limitation of the Study

There are various restrictions on this study. All of the drugs used to treat PCOS do not have complex side effects, but long-term usage of the drugs will increase the chance of certain serious consequences. So the same survey and awareness should be done to increase the awareness in large number of population.

10. CONCLUSION

These days, PCOS, also known as polycystic ovarian syndrome, is a highly prevalent endocrine condition that affects women's health. PCOS is a long-term medical disorder that initially presents as reproductive and physiological problems, but eventually leads to increased metabolic abnormalities and infertility. Common side effects that can also impact a person's way of life include breast soreness, multiple gestations, gastrointestinal trouble, skin problems, and visual disruption. This Case Study makes it abundantly evident that every drug used to treat PCOS has a number of negative side effects, such as hirsutism or infertility, severe bleeding during the menstrual cycle: Because the uterine barrier takes longer than typical to stretch, you should anticipate to bleed more heavily than usual. Periods that are inconsistent, or none at all: In summary, unless PCOS medicine is taken long-term, our study, which included a representative sample of the PCOS population, shows no significant side effects from PCOS meds. We found that using specific medications increases the risk of osteoporosis, heart failure, anorexia, multiple gestations, and depression among women. and more investigation and learning about this subject are needed.

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