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## Letter to the Editor

# Navigating the maze of polycystic ovarian syndrome enquiries with ChatGPT

Sir,

ChatGPT is a form of generative AI, a tool created by OpenAI and launched in November 2022. It lets users enter prompts to receive human-like texts or images, that are created by AI.<sup>1</sup> ChatGPT is trained with reinforcement learning through human feedback and reward models that rank the best responses. ChatGPT works through its Generative Pre-trained Transformer, which uses specialized algorithms to find patterns within data sequences. Users can ask ChatGPT a variety of questions, including simple or more complex ones, such as, “What is the meaning of life?” or “What is the history behind the invention of the telephone?”. However, ChatGPT uses

data up to the year 2021, so it has no knowledge of events and data past that year.

Medical knowledge is ever-increasing, and doctors face significant pressure in processing information due to the complexity of clinical practice. Both doctors and patients have shown interest in ChatGPT due to its ability to provide accurate and prompt responses across a wide range of topics. Since its launch, ChatGPT has shown tremendous potential in the medical field and advancements in healthcare, medical education, and research. In a study, conducted in Iran in March 2023, ninety percent of the cases in obstetrics and gynaecology were correctly handled by ChatGPT, in terms of diagnosis and management.<sup>2</sup>

**Table 1: Question and answer session with ChatGPT about PCOS.**

Questions	Answers by ChatGPT
<b>What is PCOS?</b>	PCOS stands for polycystic ovary syndrome. It's a hormonal disorder common among women of reproductive age. Symptoms include irregular periods, excess hair growth, acne, and polycystic ovaries. It can also lead to fertility issues and long-term health problems like diabetes and heart disease.
<b>How common is PCOS?</b>	Prevalence of PCOS varies depending on diagnostic criteria and populations studied, but it's estimated to affect between 5% to 20% of women worldwide. PCOS can present differently in different individuals and therefore, the true prevalence of PCOS may be higher than reported.
<b>What can cause PCOS?</b>	The exact cause of PCOS is not fully understood, but it's believed to involve a combination of genetic and environmental factors. Some possible contributors include insulin resistance, high levels of androgens (male hormones), and an imbalance in reproductive hormones. Additionally, lifestyle factors such as diet, exercise, and stress may also play a role in the development of PCOS.
<b>How do I know if I have PCOS?</b>	If you suspect you may have PCOS, it's essential to consult a healthcare professional for an accurate diagnosis. Typically, diagnosis involves a combination of medical history, physical examination, blood tests to measure hormone levels, and imaging tests such as ultrasound to check for cysts on the ovaries. Common symptoms to watch for include irregular periods, excess hair growth, acne, weight gain, and difficulty getting pregnant. However, only a healthcare provider can provide a definitive diagnosis based on your specific symptoms and test results.
<b>How to regularize menses in PCOS?</b>	There are several approaches to help regulate menstrual cycles in women with PCOS: Lifestyle changes: Maintaining a healthy weight through diet and regular exercise can help improve hormone balance and regulate menstrual cycles. Eating a balanced diet rich in fruits, vegetables, whole grains, and lean proteins while limiting processed foods and sugars can be beneficial. Medications: Hormonal contraceptives, such as birth control pills, patches, or rings, can regulate menstrual cycles by controlling hormone levels. Other medications, such as progestin therapy or anti-androgen medications, may also be prescribed to help regulate periods and reduce symptoms like excess hair growth or acne. Insulin-sensitizing medications: For women with PCOS who also have insulin resistance, medications such as metformin may be prescribed to help improve insulin sensitivity and regulate menstrual cycles.

Continued.

Questions	Answers by ChatGPT
<b>How common is infertility in PCOS patients?</b>	Infertility is a common concern for women with PCOS, but not all women with PCOS experience infertility. The exact prevalence of infertility in PCOS patients varies depending on factors such as age, weight, and other underlying health conditions. However, it's estimated that about 70-80% of women with PCOS have fertility issues due to irregular ovulation or other hormonal imbalances. Fortunately, many women with PCOS can still conceive with appropriate medical intervention, lifestyle changes, or fertility treatments. It's important for individuals with PCOS who are trying to conceive to work closely with healthcare providers to develop a personalized treatment plan.
<b>Is PCOS curable?</b>	PCOS is a chronic condition, meaning there is no cure for it. However, its symptoms can often be managed through lifestyle changes, medication, and other treatments. Lifestyle modifications such as maintaining a healthy diet, regular exercise, and managing stress can help improve symptoms and overall health. Medications may be prescribed to regulate menstrual cycles, reduce excess hair growth, and manage other symptoms. Additionally, fertility treatments may be recommended for women trying to conceive. While PCOS cannot be cured, with proper management, many women can lead healthy and fulfilling lives.
<b>Does PCOS go away after menopause?</b>	PCOS is a hormonal disorder that affects women of reproductive age, so it typically persists after menopause. Menopause marks the end of a woman's reproductive years, and with the cessation of menstruation, many of the symptoms of PCOS, such as irregular periods and fertility issues, may no longer be relevant. However, other symptoms of PCOS, such as insulin resistance, weight gain, and cardiovascular risks, can persist beyond menopause. Therefore, while menopause may alleviate certain symptoms of PCOS, the underlying hormonal imbalances and associated health concerns may still need to be managed through lifestyle changes and medications even after menopause.
<b>Role of myoinositol in PCOS treatment</b>	Myoinositol, a type of sugar alcohol, has been studied for its potential role in the treatment of PCOS. It is believed to improve insulin sensitivity, regulate menstrual cycles, and reduce other symptoms associated with PCOS. Some potential roles of myoinositol in PCOS treatment include: Improving insulin sensitivity: Myoinositol may help improve the body's response to insulin, which is often impaired in women with PCOS. By enhancing insulin sensitivity, myoinositol may help regulate blood sugar levels and reduce the risk of complications associated with insulin resistance, such as type 2 diabetes. Regulating menstrual cycles: Research suggests that myoinositol supplementation may help regulate menstrual cycles in women with PCOS by promoting normal ovarian function and ovulation. This can help improve fertility and reduce symptoms such as irregular periods and infertility. While research on the efficacy of myoinositol in PCOS treatment is still ongoing, some studies have shown promising results. However, it's essential to consult with a healthcare provider before starting any new treatment, including myoinositol supplementation, to determine the appropriate dosage and ensure safety, especially if you have any underlying health conditions or are taking other medications.
<b>Is there any problem if I conceive with PCOS ?</b>	Conceiving with PCOS can pose some challenges, but many women with the condition are able to have successful pregnancies. Some potential concerns associated with PCOS and pregnancy include: Women with PCOS may have a slightly higher risk of miscarriage compared to women without the condition. Pregnant women with PCOS have an increased risk of developing gestational diabetes, a type of diabetes that occurs during pregnancy. Women with PCOS may have a higher risk of developing high blood pressure and preeclampsia during pregnancy, which can lead to complications such as preterm birth and low birth weight. Women with PCOS may have a slightly higher risk of preterm birth and may be more likely to require a caesarean delivery (C-section) due to factors such as gestational diabetes or complications during pregnancy. Despite these potential challenges, many women with PCOS are able to have healthy pregnancies and give birth to healthy babies. It's essential for women with PCOS who are planning to conceive to work closely with their healthcare providers to manage their condition and optimize their chances of a successful pregnancy. This may involve lifestyle modifications, medications, and close monitoring throughout pregnancy.

Polycystic ovarian syndrome (PCOS) is a chronic endocrine disorder affecting women of reproductive age.<sup>3</sup> It is characterized by various symptoms such as menstrual dysfunction, infertility, hirsutism, acne, and obesity. According to WHO, PCOS affects around 8%-13% of

reproductive aged women and up to 70% of affected women remain undiagnosed worldwide. Individuals with the above-mentioned symptoms, are sometime seeking answers from AI, like ChatGPT to obtain information about PCOS and look for potential solutions.<sup>4</sup>

The attached table outlines the answers given by ChatGPT to enquiries, that might be posed by individuals lacking prior medical education.

The answers provided by ChatGPT can be appealing to common people as the language is easy to understand and explained in layman's terms such as, "Pregnant women with PCOS have an increased risk of developing gestational diabetes, a type of diabetes that occurs during pregnancy."<sup>5</sup> ChatGPT quite accurately mentioned the possible risk factors and management pertaining to a particular complaint. At the same time, all the answers were provided in an empathetic manner by creating a virtual comfortable milieu around the enquirer. Furthermore, it appropriately raised concern and emphasized on consultation with healthcare provider, wherever deemed necessary.

However, ChatGPT is not a specialized medical application and should not be solely relied upon for the purpose of decision-making. It is limited by hidden social biases, risk of mis-interpretation and thereby, dissemination of false information and failure to provide references for verification. ChatGPT does not have access to external sources or databases, which raises concern in this era of evidenced based medicine.

At present, ChatGPT is at a nascent stage in terms of experimentation. Medical practitioners are yet to explore such an AI for the purpose of managing clinical conditions, medical education and research. There is a necessity for large scale studies to both understand the utilisation potential of ChatGPT and find a balance between vast pool of information and accuracy. To state further, there is a scope for clinicians to embrace AI for the advancement and betterment of the medical practice in the coming future, as famously quoted, "The role of artificial intelligence in healthcare is not to replace the work of doctors, but to augment their capabilities and enable them to provide better care", by Dr. Daniel Kraft.

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