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Polycystic Ovarian Syndrome

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Introduction

Polycystic Ovary Syndrome, also known as PCOS, has been determined to be one of the most common endocrine disorders found in the reproductive-age women and can be the cause of infertility in women that have been diagnosed (Treede, Deeks and Moran, 2013).

The exact pathophysiology of PCOS is complex and remains largely unclear to the medical world. Within the last several years research on PCOS has been on the rise. Therefore, it is important for healthcare professionals and policy makers to translate new research into knowledge and action (Treede et al., 2013).

Figure 1: Ovary with cysts on ultrasound



(Polycystic Ovary, 2015)

Signs and Symptoms

- Evidence of ovarian cysts on ultrasound
- Acne
- Hirsutism
- Weight gain or difficulty losing weight
- Hair loss
- Oligomenorrhea and/or amenorrhea
- Trouble getting pregnant
- Chronic fatigue
- Sleep Apnea
- Headaches (Cunningham, 2017)

Presentation of Case

Stephanie is a 25-year-old female who is concerned with having difficulty getting pregnant with her husband after a year of trying. Around the age of 13, Stephanie recognized issues with both acne and irregular periods. She went to her primary care provider (PCP) to discuss these signs and symptoms. The PCP prescribed her OrthoTri-Cyclen, a combination birth control pill. After taking the pill, her periods became regular and her acne became more manageable. Over the years, Stephanie has always had issues with weight gain and difficulty losing weight. At age 24, Stephanie gets married and decides to stop taking her birth control. She notices her periods become increasingly spread apart. After a year of trying to conceive without a single positive pregnancy test, she schedules an appointment with her OB/GYN. The nurse practitioner decides to draw lab work (metabolic panel, TSH, lipid panel, HbA1c, and hormone levels) and perform a pelvic exam. On physical examination, her anatomy is normal without any signs of abnormalities or signs of infection. The metabolic panel, TSH, and lipid panel resulted within normal range. However, the HbA1c was within the prediabetic range of 5.9 while her estradiol levels were low and testosterone levels were high. Due to these abnormal results, the nurse practitioner schedules Stephanie for an ultrasound to evaluate her ovaries. Upon inspection with a transvaginal ultrasound, several cysts were evident on both ovaries. Based on these findings (irregular periods, abnormal lab results, and ovarian cysts), the nurse practitioner makes the diagnosis of Polycystic Ovary Syndrome (PCOS). The treatment plan prescribed includes Metformin 1500mg/day, teaching on ovulation tracking and family planning, and a referral to a fertility counselor for emotional support.

Statistics

- Research has shown that PCOS affects up to one in five women of reproductive age (Treede et al., 2013).
- It is estimated that close to 70% of women with PCOS have not been diagnosed (Watson, 2017).
- Up to 80% of women with PCOS are considered overweight or obese (Watson, 2017).
- About 70% of women with PCOS experience unwanted hair growth, or hirsutism (Watson, 2017).
- PCOS is considered the leading cause of infertility in women today (Pasquali, 2018).

Etiology

- Despite continued research, the exact cause of PCOS remains unclear. However, several factors have been found to possibly play a role in the prevalence of the syndrome (Watson, 2017).
 - Insulin resistance
 - When cells become resistant to insulin, blood sugar levels rise, causing the body to produce more insulin. Excess insulin can increase androgen production, which could lead to difficulties with ovulation (Watson, 2017).
 - Inflammation
 - Women with PCOS have been found to have increased levels of inflammation within their body. Inflammation can lead to becoming overweight as well as increased androgen production (Watson, 2017).
 - Genes
 - PCOS has been proven to be a familial condition. Although the role of genetics has been strongly supported, the exact genes responsible for the etiology of the syndrome have not been discovered (Cunningham, 2017).

Pathophysiology

PCOS is a heterogeneous condition that results in ovarian dysfunction in women of reproductive age (Cunningham, 2017). The term and diagnosis of PCOS is new to the medical world and has been on the rise within the last 20 years. Therefore, the exact pathophysiology and etiology of this endocrine disorder is complex and remains largely unclear (Treede et al., 2017). The three main features of PCOS include: cysts on the ovary, high levels of male hormones (androgens), irregular or skipped periods (Watson, 2017).

The hypothalamus and anterior pituitary gland control maturation of the ovaries. Both structures within the brain are responsible for the release of follicle-stimulating hormone (FSH) and luteinizing hormone (LH). Collectively, these hormones act on the ovaries which leads to ovulation. According to the World Health Association, PCOS is classified as a group II ovulatory disorder, which are dysfunctions of the hypothalamic pituitary-ovarian axis (Cunningham, 2017).

In PCOS, fluid filled sacs grow inside the ovary. These sacs are follicles of immature eggs that never matured enough to trigger ovulation (Pasquali, 2018). The lack of ovulation causes hormone imbalances. Typically, estrogen, LH, and progesterone levels are low while androgen levels are high (Pasquali, 2018). The presence of these cysts are thought to occur because of two abnormalities within the blood: hyperandrogenism and hyperinsulinemia. Hyperandrogenism, or high levels of androgen, has been argued to be the defining feature in the disease. Hyperandrogenism causes the egg follicles to go into an arrested state known as atresia which inhibits the maturation of the egg. Due to the high levels of androgen, the ovary is unable to release an egg for ovulation which causes oligomenorrhea and/or amenorrhea (Roisten, 2018).

Figure 2: Illustration of normal follicle growth versus in women with PCOS

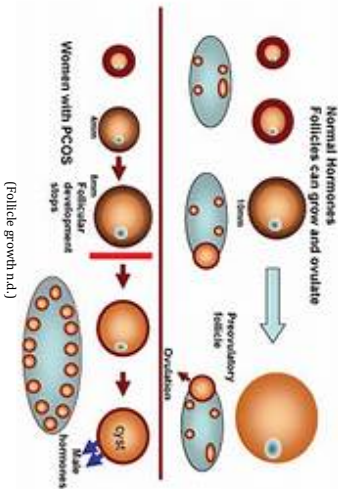
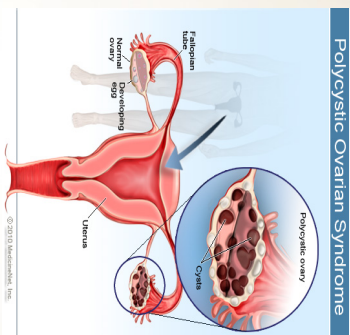


Figure 3: Demonstration of normal versus polycystic ovaries



Significance

PCOS combined with obesity put women at risk for high blood pressure, high blood sugar, low HDL, ("good") cholesterol, and high LDL, ("bad") cholesterol. Together these factors make up what is known as metabolic syndrome. Any one of these puts a person at greater risk for diabetes, heart disease, and stroke (Watson, 2017).

Due to the cysts within the ovaries as well as hormonal imbalances, women with PCOS most often experience irregular or an absence of periods. This means that ovulation did not occur and therefore conception cannot be carried out without the release of a matured egg. This is the reason PCOS is considered to be one of the main reasons for infertility in women of child bearing age (Treede et al., 2013).

Women with PCOS who do conceive are at an increased risk of developing gestational diabetes, preeclampsia, preterm labor, and stillbirth. Therefore, often pregnant patients with PCOS are considered "at risk" and require more frequent checkups and/or monitoring (Williams, Mordecai, and Portier (2016).

Treatment

- Because PCOS is a multifaceted syndrome, it is important to individualize treatment based on the patient's presentation and desire to get pregnant (Ovulation induction agent)
- Metformin (Insulin-sensitizing agent)
- Letrozole (Follicle-stimulating agent of clinical androgens)
- Hormonal contraceptives (Helps with menstrual irregularities, acne, and hirsutism)
- Diet and exercise (Prevents the prevalence of obesity) (Williams et al., 2016)

Implications for Nursing Practice

- It is important to get an in depth past medical history as well as description of signs and signs of patients in order to make the proper diagnosis.
- Teaching and coaching is a major component in the treatment of this disease. Patients will require information on diet and exercise.
- Ovulation tracking, family planning, etc.
- PCOS is a complicated disorder that affects many mechanisms within the body. Therefore, it is important for clinicians to do a thorough job of ordering tests and gathering the information needed to control PCOS as well as any other comorbidity they may exist as a result.
- One of the most important aspects of PCOS that has been discussed, the emotional aspect that has been discussed, is the emotional aspect that has been discussed. Women with a history of infertility often have been found to be at increased risk to develop mental health disorders (Hanson, Jakubone, Davis, Silver, Peterson, and Jakubone (2016). It is very important for psychiatric consultation in order to deal with the issues surrounding infertility, decreased sexual desire, and/or altered body image.

Conclusion

PCOS recognition and diagnosis has been on the rise and is becoming increasingly more common among women in their reproductive years. For that reason, it is extremely important for nurses and practitioners to be more vigilant for PCOS and advocate for the continued research and further development of understanding of this complex disorder that affects so many women.

References

