



Potential for Offspring with Varicocele and Pcos

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Abstract

Infertility affects a significant portion of couples worldwide, with 30% of cases attributed to male factors, 30% to female factors, 30% to both partners, and 10% to unknown causes. This study focuses on two common causes of infertility: varicocele in men and Polycystic Ovary Syndrome (PCOS) in women. Varicocele, characterized by the enlargement of veins within the scrotum, disrupts spermatogenesis by increasing testicular temperature, leading to poor sperm quality. PCOS, affecting 5-10% of women of reproductive age, is marked by excessive androgen levels, irregular menstruation, and obesity, significantly raising the risk of infertility. Through case studies and literature review, this research highlights the potential for individuals with varicocele or PCOS to achieve pregnancy with appropriate treatment. The study aims to explore the specific examination and treatment processes required for these conditions and to provide insights into improving fertility outcomes for affected individuals.

Keywords: Infertility, varicocele, Polycystic Ovary Syndrome (PCOS), sperm quality, androgen levels, treatment.

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Introduction

In a global context, 30% of infertility cases originate from men, 30% from women, 30% from both, and 10% have unknown causes (Wasilewski et al., 2020). One of the causes of infertility in men is varicocele, while in women it is PCOS (Polycystic Ovary Syndrome). Varicocele is an enlargement of the veins within the scrotum. It causes the scrotal area to become 'hot,' thus disrupting the process of spermatogenesis (sperm production). Therefore, individuals with

varicocele often experience fertility issues because the quality of the sperm produced is not as good as in normal individuals. Varicocele can cause damage to the testicles, resulting in smaller volume, softer texture, inhibited testicular growth, reduced sperm count, progressive damage to the ipsilateral testis, and bilateral testicular atrophy.(Franco et al., 2023) Varicocele is the most common cause of infertility in males. It occurs in 10-20% of the male population, 35-40% in males with primary infertility, and 80% in males with secondary infertility. (Tatem & Brannigan, 2017) In a case study from the Wardha region, a married couple experienced primary infertility for 4 years, with the male patient suffering from varicocele. The male patient received treatment in the form of hCG therapy, and after six months, this therapy yielded significant results in the form of improved sperm quality. (Will et al., 2011) From the case study, it can be understood that individuals with varicocele have the potential to conceive, but it requires specific examination and treatment processes.

Polycystic Ovary Syndrome (PCOS) is a condition experienced by women of reproductive age, causing 5-10% of women in their reproductive years to experience infertility. PCOS is characterized by excessive androgen, irregular menstruation, hirsutism, and obesity.(Khan et al., 2019) Based on research conducted at a private medical practice in Palembang, it was found that 249 women experienced PCOS, and there is a significant relationship between PCOS and infertility. Women with PCOS have a risk 8.572 times greater of experiencing infertility.(Armijo-Sánchez et al., 2024) In a case study of PCOS disorder in Gran Canaria, Spain, a 31-year-old female patient experienced infertility for 2 years. After receiving supplementation of MYO and DCI in a ratio of 3.6:1, antioxidant food supplements, and undergoing ART, pregnancy was successfully achieved in this female patient. Women with PCOS can achieve pregnancy in a short period, typically within 1-3 months. [Click or tap here to enter text.](#) From the case study, it can be understood that individuals with PCOS have the potential to conceive, but it requires specific examination and treatment processes

Every married couple wants offspring to continue their generation. In Indonesian society, the completeness of a family, consisting of a father, mother, and child, is seen as the ideal representation of a family.(Kavoussi et al., 2024) Of the many cases of married couples who want to have children, the author will discuss reproductive disorders, namely varicocele and PCOS as one of the causes of infertility in men and women.

Methodology

Literature Review: A comprehensive review of the existing literature on varicocele and PCOS was conducted to gather background information, prevalence rates, and the impact of these conditions on infertility. The sources included peer-reviewed journals, clinical case studies, and relevant medical texts. Articles were searched from National and International Journals, such as Scopus, and Google Scholar. The literature review used systematic literature review and PRISMA methods.

Results and Discussion

Varicocele is clinically defined as the abnormal dilation of the pampiniform plexus veins and testicular veins with continuous or intermittent venous blood reflux (Valentino et al., 2014), is described in several studies as a condition where the veins within the scrotum enlarge. The incidence of varicocele in infertile couples is approximately 17-41%, whereas in the general population, it is about 4-30% (Ulhe et al., 2024). Varicocele occurs due to problems with the valves in the spermatic cord that carry blood to the testicles. When these valves do not function properly,

blood does not flow well and begins to accumulate in the veins at certain times (Veronika et al., 2022). Simply put, varicocele happens when the blood flow to the testicles is obstructed, causing the veins around the testicles to enlarge.

Varicocele causes inflammation in the testicular veins, which increases the temperature of the testicles, thereby reducing the number of sperm produced. Additionally, blood retention in varicocele can disrupt blood circulation in the testicles, leading to poor nutrient supply and a decrease in partial oxygen pressure. This results in the spermatogenesis process lacking energy and causing endocrine dysfunction (Akbar, 2020). Infertile men with varicocele often experience increased DNA damage in their semen. In one study, increased sperm DNA fragmentation (SDF) was observed in 49% of varicocele patients with normal semen profiles and 58% of patients with abnormal semen profiles (Smith et al., 2006). In another study, the highest SDF levels (according to SCD) were found in varicocele patients ($35.7 \pm 18.3\%$) and patients with subclinical genital infections ($41.7 \pm 17.6\%$) (Esteves et al., 2015). SDF (Sperm DNA Fragmentation) refers to damage or breakage of the DNA strands in sperm. High levels of DNA fragmentation in sperm can affect male fertility by being associated with lower sperm quality, reducing the chances of successful fertilization, and increasing the risk of miscarriage and genetic abnormalities in the fetus.

Magdar's study shows that 60% of varicocele patients who underwent surgery achieved pregnancy within one-year post-operation, compared to only 10% of patients who did not undergo surgery. Marks' research found a 41% increase in semen motility and a 21% improvement in morphology after varicocelectomy. Meanwhile, Pryor and Howards reported improvements in semen quality after varicocelectomy ranging from 51-78% (Pasqualotto et al., 2003). Completely avoiding varicocele might not always be possible, but several steps can be taken to reduce its risk. Avoid excessive heavy activities, wear supportive underwear, and maintain a healthy weight. Keep the scrotum's temperature regulated by avoiding excessive heat exposure and prolonged sitting. Adopting a healthy lifestyle with a nutritious diet, regular exercise, and avoiding smoking and excessive alcohol can also help. If there is a family history or suspicious symptoms, consult a doctor.

According to medical research, patients with PCOS have embryos that can be developed so that their high quality is equivalent to women who do not suffer from PCOS but still show unsatisfactory results (Kotlyar & Seifer, 2023). There are other studies, that have the opinion that PCOS patients have eggs with poor quality, so the potential to get pregnant will be lower than in women who do not suffer from PCOS. There are medical studies that explain that IVF treatment normalizes pregnancy and embryo development, but many still experience miscarriages and decreased fertilization (Agenor & Bhattacharya, 2015) According to (Wang et al., 2023) PCOS when doing the EPL test, the results are almost the same as those who do not experience PCOS. However, it has a relatively small number of ovaries compared to those without PCOS. According to (Namita et al., 2022), Retrieval of a large number of oocytes is not certain to increase pregnancy. Quality is important in increasing pregnancy in PCOS. The number of oocytes in PCOS is higher than those without PCOS, but in terms of quality and number of embryos, PCOS is slightly lower. Researchers were also able to find significant data on lowering blood cholesterol which can improve ART cycles in PCOS.

Patients with PCOS are worried about not being able to have offspring. However, PCOS sufferers have the possibility of having offspring with a lower chance and the time needed is also longer than women who do not suffer from PCOS (Simon et al., 2023). With the small chance that they have, then the patient must do a fairly intense treatment and treatment so that their fertility increases. So that it has a greater chance, but each patient has a different chance of getting pregnant. In treating PCOS, no treatment makes patients completely cured, their hormones

normalized, and their clinical appearance. Ovulation induction forms the background for assisted fertility treatment in PCOS sub-fertile women. Letrozole has already proved beneficial in women with clomiphene resistance. (Samardzic et al., 2021) treatment can be done with RCT on 60 clomiphene. Clomiphene citrate and receiving combined letrozole. Some ways can be done such as, laparoscopy is medical surgery performed to remove disease, bariatric surgery, checking prolactin hormone levels, TSH tested to diagnose, pelvic ultrasound, SHBG binds certain hormones, glucose tolerance tests, and many more treatments that are carried out both medical and non-medical.

PCOS can be avoided by maintaining a healthy diet, lifestyle, physical activity, taking medicines from doctors, exercising, and 5-10% weight reduction which is significant enough to improve insulin resistance, restore ovulation and improve menstrual regularity, improve, hirsutism, and dyslipidemia (Calcaterra et al., 2021). In research (Kite et al., 2019) discussing the patient, a 36-year-old woman who experienced infertility for seven years after marriage. She was diagnosed with PCOS and had a family history of PCOS. Her ovarian reserve was very low with high FSH. However, she was not the only one experiencing problems, her husband also suffered from *teratozoospermia* which caused almost all of the sperm to be damaged. This case was treated with medical procedures. The first step is to do it with HMG for 3 days to speed up the maturation process and develop the corpus luteum. Next, do the cetrorelix process and develop the corpus luteum. Next, do the cetrorelix process to delay ovulation, and trigger it with hCG for 36 hours before OPU. When you get the oocyte, add semen and go through the IMSI process. After that, fertilize the embryo for five days and check. Do it continuously for one month. But not only that. Inject estradiol for progesterone twice a day until day 20 to carry out embryo transfer.

Another patient who also experienced infertility (Tan et al., 2018) This patient was a 37-year-old woman. She was diagnosed as a PCOS sufferer and failed to undergo the IUI process. Had a miscarriage when I was 6 weeks pregnant due to the IVF cycle. She has symptoms such as weight gain, and high blood pressure and experiences irregular menstruation for around 45 to 60 days. The procedures used to treat this case include giving medication containing metformin, doing physical activity, and dieting. Next, she attempted ICSI but failed due to the patient's inability to accept the treatment. So what can be done is to reduce FSH and consume supplements for more than 12 weeks. Finally, get nice oocysts that are mature and can be transferred for a successful pregnancy process.

Polycystic Ovary Syndrome (PCOS) is a common hormonal condition in women of reproductive age. The WHO thinks that the cause of PCOS is anovulatory infertility. Some studies suggest that the disease can be passed on through mothers who have been identified with PCOS. PCOS causes irregular egg release each month so menstruation will also be irregular (Love et al., 2016); . In general, PCOS can be caused by (Patel, 2018): (1) hormonal imbalance, either excess androgen or excess insulin. (2) genetic factors. (3) chronic inflammation that disrupts the ovaries and ovulation. (4) lifestyle, such as lack of physical activity and being overweight. The fertility rate of women with PCOS is around 60% and it takes a long time to successfully conceive. There are two types of infertility: primary infertility if the wife has never experienced pregnancy, and secondary infertility if the married couple fails in the pregnancy process calculated from one year after giving birth or after one year of fostering a household but has not yet experienced pregnancy. This is not only caused by the wife, but the husband is also likely to cause it to happen. Therefore, researchers conducted a study to determine the length of time it takes PCOS sufferers to have offspring. That is around a year or more of time needed to get pregnant.

Conclusion

Infertility is a significant global issue, with varicocele in men and Polycystic Ovary Syndrome (PCOS) in women being common contributors. Varicocele, causing poor sperm quality through increased testicular temperature, and PCOS, characterized by excessive androgen levels, irregular menstruation, and obesity, both substantially raise the risk of infertility. This study, through a comprehensive literature review and case studies, highlights that with specific examination and targeted treatments, individuals affected by varicocele or PCOS can improve their fertility outcomes. The effective management of these conditions requires tailored medical interventions, which have shown promising results in enhancing the chances of conception. Ongoing research and improved treatment protocols are vital for further advancements in addressing infertility related to varicocele and PCOS.

Conflicts of Interest

The authors declare no conflict of interest.

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