

A Pre-Conception Nutritional Approach

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*[Editor's Note: Chris D. Meletis, ND is co-author of the book *Enhancing Fertility: A Couple's Guide to Natural Approaches*.]*

The inability to conceive a child is one of the most heartbreaking situations a couple can endure. Unfortunately, due to reduced sperm counts, exposure to environmental estrogens and a variety of other modern day factors, more and more couples are struggling with infertility. In the U.S., an estimated 14 percent of couples have infertility problems and an estimated 10.2 percent of women between the ages of 15 to 44 (roughly 6.2 million women) experience some type of impaired fertility. The number of women with infertility problems is projected to reach 7.7 million by the year 2025.¹

Infertility can occur equally in men as in women, with 30 percent of infertility attributable to men and 30 percent to women, while another 30 percent is attributed to both partners and the remaining 10 percent is related to unknown factors. Other statistics indicate the annual incidence of male infertility is at least 2 million cases, which equates to an incidence rate of approximately 1 in 136 men in the U.S.²

Infertility in general is defined as the inability to become pregnant after one year of unprotected intercourse, but 4.5 million couples in the U.S. do not conceive at their first attempt. Women in their 20s are usually advised to be more persistent and have greater leeway, waiting more than a year before seeking medical consultation. Couples in their mid to late 30s, on the other hand, are advised to seek help if they have not been successful within a year.

The first step is to determine which partner is infertile and/or whether it is a combined effect of suboptimal fertility of both partners. This article will offer strategies that both genders can apply to enhance their ability to conceive.

Causes of Female Infertility

There are multiple reasons for infertility in females. Ovulatory dysfunction, resulting from the aging process, is an important cause of infertility as well as anovulatory cycles, amenorrhea (absence or suppression of menstruation), luteal phase defects, premature ovarian failure, polycystic ovarian syndrome, and high prolactin levels. Furthermore, anatomical problems in the structure or function of the fallopian tubes from past abdominal or pelvic surgery and past infections (pelvic inflammatory disease) prevent eggs from properly traveling through the tubes.

Another factor that affects a female's ability to conceive is uterine growths such as fibromas, myomas and leiomyomas (uterine fibroids), which negatively affect implantation of the fertilized egg. Additionally, endometriosis, where fragments of endometrial tissue may be carried upward through the fallopian tubes and become implanted there and elsewhere in the pelvic area, is a common cause of female infertility.

Alcohol³ as well as certain medications, such as hormones, antibiotics, antidepressants, pain medications, and aspirin and ibuprofen when taken at midcycle,⁴ also can impair conception as can

medical conditions such as inflammatory bowel disease, celiac sprue, epilepsy, thyroid conditions, and diabetes.⁴

Exposure to environmental chemicals is another aspect to investigate when considering the causes of female infertility. Increasing evidence indicates environmental exposure to chemicals, radiation, and infections on germ cells affects fertilized eggs, and hormonal balance as it relates to implantation and development.⁵ Second hand cigarette smoke, which contains cadmium, a toxic metal known to have negative effects on fertility, presents an additional problem.⁶

In addition to following the nutritional supplement regimen I outline below, I recommend taking a hair analysis test, which can offer insights into a woman's exposure to toxic, fertility-altering metals. Taking an organic acid metabolic profile test also will offer insights as to individual nutritional needs and environmental exposures.

Caffeine consumption⁷ is another important factor since studies show a decreased incidence of miscarriage in women who avoid caffeine during pregnancy. Furthermore, dramatic weight loss, especially when accompanied by excessive physical activity, can predispose a woman to irregular menstrual cycles and disturbed ovulatory patterns.⁸ Rapid weight loss is known to lower progesterone levels, slow follicular growth, and inhibit the luteinizing hormone surge, disallowing ovulation.⁹ Additionally, less intense weight loss may also depress hormone levels to an extent that an insufficiently sized corpus luteum fails to sustain an early pregnancy. Weight loss also mobilizes body fat that contains toxins and thus increases exposure to chemicals that have been previously stored in fatty tissue.¹⁰

Causes of Male Infertility

The primary causes of male infertility entail problems with spermatozoa production or delivery that may result from certain types of hormonal dysfunction. Trauma or anatomical defects in the reproductive system and other illnesses also can all lead to infertility. For example, factors that affect male infertility may include: 1) Cryptorchidism, a failure of one or both testes to descend, which can impair spermatogenesis; 2) Cystic fibrosis, which may cause an absence of sperm, vas deferens, or seminal vesicles; 3) Ductal obstruction, caused by repeated infection, inflammation, or a developmental defect; 4) Hemochromatosis, a metabolic disorder that causes iron deposition in the testes; 5) Hormone dysfunction, caused by a dysregulation in the hypothalamic-pituitary-gonadal axis; 6) Retrograde ejaculation, an anatomical defect involving the muscles and nerves of the bladder neck and 7) Varicocele, which can alter testicular temperature affecting spermatogenesis.

Like in women, use of certain pharmaceutical and recreational drugs can cause infertility in men. Drugs used to treat hypertension, arthritis, and digestive disease, and chemotherapy drugs are associated with sperm production problems and infertility. Sexually transmitted infections and sickle cell anemia also are associated with fertility problems in men and systemic diseases such as a high fever, infection, kidney disease, or metabolic disorders can impair spermatogenesis.

Environmental factors can have an equally devastating effect on fertility. Chemical exposure and environmental toxins and lifestyle habits such as smoking,¹¹ alcohol consumption,¹² dietary factors (insufficient nutrition), oxidation, and even wearing brief-style underwear,¹³ which hold the testes closely to the body, can all have a role to play in infertility.

Several reports have detailed the occurrence of decreased sperm counts in men who reside in developed countries over the last 50 years. The results of these reports have given birth to the theory that this trend may be the result of increased environmental exposure to estrogen-like compounds, a theory validated in a number of investigations.¹⁴⁻¹⁶

Nutritional Interventions to Enhance Female Fertility

Strategies can be employed in women to optimize the chances of conception. Folic acid can be used for maintaining proper cervix health by preventing cellular oxidative damage. Folic acid interferes with the activity of human papilloma virus (HPV) infection, a leading cause of abnormal pap smears and cervical cancer.¹⁷

B vitamin deficits may be relatively common today as a result of certain medications (oral contraceptives) or lifestyle factors (inadequate intake of vegetables and fruits). Inadequate B vitamin levels may predispose a person to altered hormone levels.¹⁸

Iron may prove to be another important preconception nutrient. One report demonstrated that women with lower iron levels could improve their fertility when supplemented with this mineral.¹⁹ Physiologically, this makes sense, as a woman with insufficient amounts of iron will not be able to respond to the high demand for this nutrient once conception has been achieved and a new blood supply is being created for the developing baby. Prior to supplementing with iron, a woman should be tested to determine the actual iron needs of her body by measuring (ferritin) and complete blood count (CBC) levels.

Known for its multiple health effects, vitamin C may assist certain populations in achieving pregnancy. One study showed that women taking a fertility agent known as clomiphene with no results were then able to have a menses and ovulate following supplementation with 400 milligrams of vitamin C.²⁰ Another study, showed that when supplemented with vitamin C and E, laboratory animals were able to ovulate more frequently when supplemented in comparison to other non-supplemented animals of similar age.²¹

Prenatal vitamins should be taken not only during pregnancy, but prior to it as well. A study evaluating the supplementation of multivitamins during a 28-day preconception period demonstrated a significantly increased rate of conceptions among women who supplemented preconceptually in comparison to women given placebo in the same time period. This difference registered as a 5 percent decreased time to achieve conception among those supplemented.²² Additionally, these researchers demonstrated a significantly higher occurrence of multiple births among the supplemented group in comparison to both the placebo group as well as the entire population from which the study groups were taken.²³

Botanicals can work with the nutrients mentioned above to enhance hormonal health in females. Tribulus terrestris is useful in assisting in producing productive ovulatory cycles. A concentrated form of tribulus standardized to 45 percent steroidal saponin content was demonstrated to assist women in achieving ovulatory cycles when dosed at 250-500 milligrams three times per day for 3 months.²⁴

Vitex agnus castus (Chasteberry) may have prolactin-inhibiting effects, and has been used in women experiencing sterility due to secondary amenorrhea and luteal insufficiency. The herb has

normalized luteal phase defects, and may increase the chances of becoming pregnant in women with relative progesterone deficiency. In women with hyperprolactinemia, Vitex suppressed prolactin release, lengthening luteal phases and improving progesterone synthesis in women after 3 months of using the herb.²⁵ In one study, 120 women with polymenorrhea (abnormally frequent menstrual cycles), oligomenorrhea (scanty or infrequent menstrual flow) and corpus luteum insufficiency were treated with a standardized extract of Vitex for 6 months. Sixty percent of these women had sought conception assistance previously. During the study progesterone levels increased from an average of 6.4 nanograms per milliliter to 9.3 nanograms per milliliter while 64 percent of the women's cycles became normalized and 29 percent became pregnant.²⁶

As mentioned above, chasteberry increases the chances of becoming pregnant in women with relative progesterone deficiency. Therefore, a logical approach is to use natural progesterone cream in conjunction with chasteberry and the other nutrients mentioned above to enhance female fertility. Progesterone is made in the ovaries of menstruating women, by the placenta during pregnancy, and in smaller amounts by the adrenal glands. About 20-30 mg of progesterone are produced per day during the luteal phase of the menstrual cycle and up to 300-400 mg are produced daily during pregnancy. During the third trimester of pregnancy, women secrete 20 times more progesterone than during the last two weeks of their normal menstrual cycle. Low progesterone levels are associated with infertility and progesterone supplementation in animals restores reproductive function.²⁷

In a randomized, double-blind study of women with inadequate luteal phase and an increased risk of miscarriage prior to 12 weeks of pregnancy, vaginal administration of progesterone reduced pain and the frequency of uterine contractions and improved the outcome of pregnancies in many of the subjects.²⁸ Moreover, clinical experience indicates an increased rate of conception when women who have had difficulty conceiving use natural progesterone.

TABLE 1. Nutritional Support for Female Fertility Enhancement	
Folic Acid	Promotes good cervical health and, together with other B vitamins, helps support proper hormone levels.
Iron	Low iron levels linked to a more difficult time conceiving; important for the new blood supply to the developing fetus. Ferritin and complete blood count should be tested prior to supplementation.
Vitamin C	Assists with healthy ovulation and menses.
Prenatal Vitamin Formula	In a human, placebo-controlled trial, increased conception rates.
Tribulus Terrestris	Assists in producing productive ovulatory cycles.
Chasteberry (Vitex agnus castus)	Inhibits prolactin, normalizes luteal phase defects, and may increase the chances of becoming pregnant in women with relative progesterone deficiency.
Natural Progesterone Cream	Low levels of progesterone are linked to infertility; progesterone supplementation in animals restores reproductive function; Human studies and clinical experience indicate progesterone can improve the outcome of pregnancies.

Strategies to Enhance Male Fertility

In males, one of the primary focuses of enhancing fertility is to assist the body in producing healthy sperm. A number of nutrients and botanicals influence this critical function. Low zinc levels have a negative effect on serum testosterone concentration and seminal volume,²⁹ while seminal plasma zinc concentration are significantly correlated with sperm density, possibly contributing a positive effect on spermatogenesis.³⁰ Infertile males have lower levels of seminal plasma zinc, which was associated with reduced levels of zinc in the blood.³¹

In one study, researchers studied zinc's effects in infertile male smokers by investigating the mechanism of the zinc-cadmium relationship in the testes of laboratory animals.³² Smokers have increased seminal cadmium levels, decreased sperm count, motility and morphology. In this animal study, zinc was able to improve sperm quality and it increased seminal levels of interleukin-4 yet also decreased TNF-alpha and IFN-gamma. When a zinc-deficient diet was fed to the animals, this allowed for cadmium accumulation in the testicles in similar amounts to that seen in animals supplemented with cadmium.

Researchers have hypothesized that zinc improves sperm parameters through a membrane stabilizing effect as an antioxidant as well as its effect on cellular and humoral immunity by decreasing antisperm antibody levels.

Because free radicals are involved in male infertility, antioxidants need to be included in any male fertility-enhancing protocol. Elevated levels of reactive oxygen species (ROS) are known to compromise sperm function and viability (damage of spermatid nuclear DNA); this oxidative stress is derived from excessive production of ROS and or impaired antioxidant defense mechanisms in the semen.³³

Antioxidants important to sperm health include selenium and vitamins A, C and E. In a study of 69 infertile men treated with placebo, selenium or selenium in combination with vitamins A, C, and E for three months, both selenium groups showed significant improvements in sperm motility.³⁴ Additionally, 11 percent of the antioxidant-treated men impregnated their partners during the study period.

Another study of men with low sperm counts with decreased motility experienced an increase in both of these parameters after 6 months of supplementation with vitamin E combined with selenium.³⁵ These benefits were reinforced in an additional study where vitamin E reduced concentrations of a marker of lipid peroxidation damage known as malondialdehyde (MDA) and increased sperm motility, resulting in a 21 percent pregnancy occurrence during the course of the study.³⁶

Vitamin C also tops the list of conception-assisting nutrients in males. Decreased levels of vitamin C have been linked to infertility and increased oxidative damage to spermatid DNA. In one astonishing study, vitamin C supplementation resulted in a 140 percent increase in sperm count in infertile male smokers, and at the end of the 60-day study every vitamin C-supplemented subject had impregnated their partner while no placebo subjects were successful in this regard.³⁷⁻³⁸

The antioxidant glutathione is an equally important part of sperm antioxidant defense and glutathione supplementation has been repeatedly shown to have a positive effect on sperm motility. Glutathione and selenium are essential for a specific protein in sperm that is responsible for motility.

In one interesting study, glutathione was supplied in a dose of 600 milligrams, and administered intramuscularly for two months. In comparison to a placebo, the treatment group showed a statistically significant effect on sperm motility, specifically in the percentage of sperm demonstrating forward motility.³⁹

Other antioxidants that play an important role in sperm health include: 1) coenzyme Q10, which protects against reactive oxygen species in the spermatic membranes, significantly increases motility in infertile men, improves fertilization rates, and increases sperm count and motility;⁴⁰ 2) Arginine, a precursor of several compounds thought to play a role in sperm motility⁴¹ and 3) Carnitine, which plays several roles in the development of healthy spermatozoa and has been shown to increase sperm count and motility.⁴² CoQ10-H2™ is an ideal form of CoQ10 since it is more bioavailable than other forms of this nutrient.

Two botanicals—Panax Ginseng and Pygeum africanum—further enhance the effects of the above antioxidants. Panax Ginseng, well known for its energy enhancing effects, appears to have some impact on sexual function as well. A group of patients treated with an extract of ginseng had an increased number of sperm and improved motility.⁴³ Also noted in this study was an increase in total and free testosterone and a decrease in fertility-impairing prolactin. Pygeum africanum may affect male fertility due to its effects on prostatic secretions. An important part of the ejaculate, these secretions assist spermatic survival outside of the body. Sperm motility is affected by the pH of prostatic fluid, and some studies indicate Pygeum can beneficially affect prostatic fluid pH.⁴⁴ as well as support the health of subjects with prostatitis and benign prostatic hyperplasia (BPH).⁴⁵

Zinc	Low zinc levels have been associated with low serum testosterone concentration and seminal volume. Infertile males have low levels of seminal plasma zinc.
Antioxidants (Selenium, Vitamins A, C and E)	Improve sperm motility and increase chance of conception; decrease oxidative damage to spermatic DNA.
Glutathione	Has positive effect on sperm motility.
CoQ10-H ₂ ™	CoQ10 increases sperm motility in infertile men, improves fertilization rates.
Arginine	Precursor of compounds involved in sperm motility.
Carnitine	Plays role in development of healthy spermatozoa; increases sperm count and motility.
Panax Ginseng	Decreases levels of fertility-impairing prolactin; increases sperm count and motility.
Pygeum africanum	Affects prostatic secretions, which assist spermatic survival outside of the body; beneficially affects prostatic fluid pH, thereby improving sperm motility.

Conclusion

There are many causes of infertility among both men and women. Combining the nutritional supplement regimen recommended above with removal of negative influences such as exposures to environmental toxins, alcohol and cigarettes, can have fairly dramatic results. Although not a cure all, adopting these measures will serve to greatly increase the chances of successful reproduction.

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