

Optimizing Female Fertility

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Once a subject that was paid relatively little regard, fertility has become increasingly popular, as the wear and tear of modern living has altered fertility levels. Various sources cite differing statistics surrounding this phenomenon:¹

- Some sources report that 1 in every 6 couples may be infertile.
- Other sources note that 14 percent of couples have infertility problems.
- In the United States, approximately 10.2 percent of women between 15 to 44 (roughly 6.2 million women) have some kind of impaired fertility and this incidence is increasing.
- 25 percent of women have infertility problems during their reproductive years, and the incidence of this problem increased 37 percent in 35–44 year-old women between 1982 and 1988.
- The number of women with infertility problems is projected to reach 7.7 million by 2025.

Infertility is generally defined as the inability to achieve pregnancy after 1 year of unprotected intercourse. Women in their 20s are usually advised to be persistent and but have greater leeway before seeking medical consultation while couples in their mid-to-late 30s are advised to be much more persistent. Female age is considered more of a factor than in males² and, if a woman is near or older than 35, she is advised to seek assistance sooner rather than later. Yet, because male factors actually account for an estimated 40 percent of conception difficulties, the first step in evaluating a couple who is having problems with conceiving is to determine which partner is infertile.

Causes of Female Infertility

There are many reasons for female infertility, ranging from anatomical to hormonal to nutritional. Complementary and alternative medicines can be helpful for addressing nearly all conditions and causes; a select few of these are covered in this article. There are also many confounding factors. Some of the better-known causes of infertility are:

- *Ovulation problems*—Ovulatory dysfunction may result from the aging process, anovulatory cycles, amenorrhea, luteal-phase defects, premature ovarian failure, polycystic ovarian syndrome, and hyperprolactinemia.

- *Tubal defects*—Anatomical problems in the structure or function of the fallopian tubes from past abdominal or pelvic surgery causing adhesions or past infections (pelvic inflammatory disease) may prevent eggs from traveling through the tubes.
- *Uterine growths*—Growths, such as fibromas, myomas, and leiomyomas, may exist inside the uterus and negatively affect implantation of the fertilized egg.
- *Endometriosis*—Fragments of endometrial tissue may be carried upward through the fallopian tubes and become implanted there and elsewhere in the pelvic area. Endometrial cysts may block passage of eggs through the tubes or become implanted on the ovaries, preventing release of eggs. Endometriosis can affect fertility in a number of other ways.
- *Medication use*—Several different types of medications have been reported to affect female fertility; among these are hormones, antibiotics, antidepressants, pain-relieving agents, and aspirin and ibuprofen when taken at midcycle.³

Other medical problems, such as inflammatory bowel disease, celiac sprue, epilepsy, thyroid conditions, and diabetes may all adversely affect a woman's state of fertility.⁴ In sum, fertility problems are attributable to either mechanical factors, such as endometriosis and adhesions, or ovulatory dysfunction or failure.

Although there are many documented causes for infertility, unexplained infertility affects many women. Many women, after having adequate medical workups for themselves and their partners, are still unable to conceive although both members of the couple appear to be in normal health. Women, in particular, are susceptible to more influences that affect fertility than men; women typically produce one egg per month and the entire menstrual cycle is governed by strict hormonal events.

In addition, female reproductive organs are more complex than those of males; thus women are more vulnerable to anatomic and physiologic factors that could reduce fertility. Therefore, when attempting to discern the cause of female infertility, multiple factors should be taken into account.

Treatments

The treatments discussed below are supports that assist a woman's body to attain a state of highest fertility. It is not surprising nor new that, when provided with adequate nutritional and environmental support, the body can achieve a state of excel-

Nutritional Supplements for Enhancing Female Fertility

Supplements	Comments
B vitamins	1 B-complex capsule per day containing at least 800–1000 mcg of folic acid and 25–50 mg of vitamin B ₆ ; may increase to 2 capsules if patient is taking pharmaceutical medications; use to address high-stress lifestyle or inadequate diet
Iron	18 mg/day, preconceptually; 27 mg/day while pregnant
Vitamin C	500–1000 mg/per day
Multivitamin/mineral supplement ^a	Choose a high-quality supplement; doses range from 2 to 6 capsules per day

^aThe majority of prenatal multivitamin/mineral supplements contain sufficient iron; extra supplementation with iron is contraindicated.

lent health; enhancing fertility. Until then, patients who have difficulty in conceiving are advised to take as many steps toward health as necessary to prepare their bodies for reproduction.

Nutritional and Lifestyle Factors

A number of strategies can be used to address certain female health conditions. Incorporation of all factors is important for achieving overall reproductive health, regardless of the diagnostic “label” a patient has been given. In particular, females will need to work on a variety of factors to optimize their fertility. It is also important that woman who wish to use nutraceutical and botanical regimens be strongly advised to work closely with a physician because some supplements taken to improve fertility may alter the fetal environment.

Dietary Deficiencies

Regardless of research studies on the benefits of specific supplements for enhancing fertility, there is no substitute for a healthy diet. The foundation of good health has always been the proper care and feeding of the human body. Diet, in both women and men, has a profound effect on fertility; what is (and what is not) put into the body can affect the multiple things that must go right for conception to occur (or not occur).

Interestingly, the human body almost seems to have a built-in mechanism to prevent conception to the degree a person is undernourished or overstressed. Certainly, pregnancy occurs often in undernourished individuals, yet, this tendency is thought-provoking at the very least.

Indeed, food is the best medicine and avoiding contaminated food is equally important as proper diet and nutrition. Consumption of therapeutic foods and correctly prescribed supplements can help offset less-controllable environmental factors.

Environmental Contaminants

Increasing evidence relates the effects of environmental exposure to chemicals, radiation, and infections on germ cells, fertilized eggs, and on hormonal balance to implantation and

Fertility-Promoting Lifestyle Factors

What to Tell Your Patients

Help your patients improve their fertility by advising them to:

- Maintain an optimal diet, including varied sources of nutrition
- Avoid environmental chemicals at work, home, and in food sources
- Eliminate or avoid caffeine prior to conception
- Avoid drastic weight loss and dieting at least 6 months prior to conception.

development.⁵ Passive environmental exposures to pollutants are common, from workplace chemicals, to products in the air from manufacturing facilities, to urban water supplies with supposed-ly “acceptable” levels of contaminants.

Environmental chemicals that affect fertility are also in many people’s food if they do not consume foods from organic farms or derived from similar production means. Second-hand cigarette smoke presents a problem because cadmium, a toxic metal in smoke, is absorbed in the body and is known to have negative effects on fertility, as well as other components of cigarette smoke.⁶

It is easy to become overwhelmed by the numerous ways in which the world has become increasingly inconducive to optimal fertility levels; patients must be trained to be diligent in protecting themselves without becoming overwhelmed.

Alcohol

Research has proven that alcohol affects the fertility of women and men adversely and that fertility can be improved when alcohol is eliminated from the diet.⁷ The strong link between alcohol consumption by a pregnant mother and the incidence of fetal-alcohol syndrome provides strong evidence for alcohol avoidance during pregnancy; however research now points to the importance of avoiding alcohol prenatally as well, in order to boost fertility.⁸

Caffeine

Caffeine, while not the most detrimental of dietary incursions, does apparently have a rather negative effect on fertility. In fact, there is strong evidence that avoidance of caffeine is important for women who are trying to conceive. One study indicated that consumption of more than 2 cups of coffee per day may lead to adverse effects on fertility, especially among women with fallopian-tube disease and endometriosis.⁹

Other studies have shown interesting evidence associating caffeine consumption with delayed conception. Hatch and associates discerned that women who consumed >300 mg of caffeine per day had a 27-percent lower chance of achieving conception while woman who consumed <300 mg per day of caffeine had a 10-percent lower chance of conception compared to women who consumed no caffeine.¹⁰ Studies have also shown a decreased incidence of miscarriage in women who avoid caffeine during pregnancy.

Sources of caffeine other than coffee include green and black tea, soft drinks, cocoa, chocolate, and some over-the-counter medicines. Elimination of caffeine, even though the

research is not entirely conclusive, may help a couple achieve peak fertility thereby enhancing their chances for successful conception.

Dieting for Weight Loss

Dieting, adhering to a calorically stringent diet, may be detrimental to fertility in two ways:

- (1) Dramatic weight loss, especially when accompanied by excessive physical activity, can predispose women to amenorrhea. Although body weight and composition (fat versus muscle) are considered important for maintaining regular menstrual cycles, no single determinant of regularity is known at this time. Severe malnutrition, which can occur at times of intense caloric restriction, is known to result in amenorrhea and anovulation, among other ill effects.
- (2) Weight loss through less-dramatic means that achieves a loss of 30 percent or more of body fat can also lead to menstrual irregularities and then amenorrhea.¹¹ Patients who have participated in weight-loss programs aggressively may find it easier to become pregnant once some weight is gained back; individuals vary widely in this respect.

Rapid weight loss is known to lower progesterone levels, slow follicular growth, and inhibit the luteinizing hormone surge, disallowing ovulation.¹² In addition, less-intense weight loss may also depress hormone levels to an extent that an insufficiently sized corpus luteum fails to sustain an early pregnancy.

Another reason for avoiding dramatic weight loss and dieting is possibility of increased exposure to chemicals that have been previously stored in fatty tissue. As bioaccumulators, humans and other animals at the top of the food chain store certain chemicals in various tissue compartments in the body. Fat tissue is one of the main repositories of many different chemicals. By sequestering these chemicals in fatty tissue rather than storing them in more metabolically active tissue, the body is relatively protected from these chemicals.

Several studies in the literature document the biological plausibility of chemicals stored in adipose tissue creating various potential health risks.^{13,14} Rapid weight loss creates the potential for increased exposure as the chemicals that are released from adipose cells are allowed to circulate throughout the body; this may affect other organ systems.

Approximately 6 months is a safe period of time for patients to avoid rapid weight loss prior to conception, or attempts to conceive. Although this recommendation is not solidly backed by research, it is a minimal step that women who are trying to conceive may take to enhance their chances of success.

Supplements

Vitamin C, B-complex vitamins, and iron all can help assist women to conceive as shown by a number of studies.

B Vitamins

The grouping of B vitamins, as a whole, has multiple uses for health and medicine throughout the human body. Adequate sup-

Selected Botanicals and Applications for Enhancing Female Fertility^a

Herbs or preparations	Use for addressing
Puncture vine (<i>Tribulus terrestris</i>)	Anovulatory cycles
Chasteberry (<i>Vitex agnus-castus</i>)	Luteal-phase defects
Shakuyaku-Kanzo-To	Elevated androgen levels
Zhibai Dihuang	Presence of anti-zona pellucida antibodies

^aOnce a woman becomes pregnant she should be warned to discontinue these botanical medications because they may alter the fetal environment.

plementation with these vitamins may ensure fertility and healthy pregnancy in a number of ways.

Folic acid, is well-known as a necessary nutrient for preventing neural-tube defects in fetuses. The vitamin can also be used to maintain proper cervix health by preventing cellular oxidative damage. Folic acid acts as a chemopreventive agent that interferes with the activity of human papilloma virus infection (a leading cause of abnormalities that are revealed by Papanicolaou smears) and of cervical cancer.¹⁵

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 depression, carpal tunnel syndrome, and most importantly, altered hormone levels.¹⁶

What is more, it is interesting to note the therapeutic ability of vitamin B₆ and folic acid to prevent and treat morning sickness; it appears that women who ingest inadequate amounts of these vitamins tend to experience more illness during the course of pregnancy.

Vitamin C

Known for its multiple health effects, vitamin C has been shown to assist certain populations of women to achieve pregnancy. An older study showed that women taking a fertility agent (clomiphene) with no results were then able to have a menstrual period and ovulate following 400 mg of vitamin C supplementation.¹⁷

Another study, using laboratory animals as models, showed that animals who were given vitamins C and E experienced a decrease in age-related reduction in their ovulation rates; that is, the animals were able to ovulate more frequently when given the supplements compared to other animals of similar age who were not given the supplements.¹⁸ Although direct implications for human fertility cannot be assumed on the basis of this study, it does have suggest implications for age-associated infertility in humans.

Iron

Iron, which is important for erythropoiesis, may prove to be an important preconception nutrient for women who are trying to conceive. One report noted that women with lower levels of iron

could improve their fertility by taking iron supplements.¹⁹ Physiologically, this makes sense, because women with insufficient amounts of iron will not be able to respond to the high demand for this nutrient once conception has been achieved. It is important to note that, prior to taking iron, women should be tested to determine the actual (ferritin) and apparent (complete blood count) levels of iron in their bodies. It is also important to be aware if a woman is taking a multivitamin/mineral supplement because many of these contain required amounts of iron and additional supplementation may be contraindicated.

Multivitamins/Minerals

Prenatal vitamins, as their name suggests, should be taken during pregnancy and prior to it. Multivitamin/mineral supplements promote general health and supply the body with the nutrients it needs as well as those needed for a new, developing life.

A study that evaluated multivitamin supplementation during a 28-day preconception period demonstrated a significantly increased rate of conceptions among women that took a test supplement preconceptionally compared to women who took placebo during the same time period; this difference was a 5-percent decreased time to achieve conception for the women who took the test supplement.²⁰

In addition, the same research team noted a significantly higher occurrence of multiple births among the women in the supplement-treated group compared to women in the placebo group as well as the entire population from which the study groups were taken.²¹ Multivitamin supplementation seems to increase chances for successful conception when taken during preconception; supplementation should begin 3–6 months prior to conception, if possible.

Botanical Medicines and Fertility

When utilizing herbal medicine to treat medical conditions, including infertility, it is important to note that herbal medicine, when used in traditional practice, embodies the concept of natural medicines. Herbal medicines are not necessarily meant to treat specific health problems directly but rather to support the body or organ systems to regain physiologic, functional control over a body system that needs fine-tuning. Many herbal medicines can be used to help women to become pregnant, based upon patients' individual symptoms and designed to nourish each patient's body allowing it to be at its healthiest.

Puncture Vine

Puncture vine (*Tribulus terrestris*) is useful for helping the body produce productive ovulatory cycles. A concentrated form of tribulus, standardized to 45 percent steroidal saponin content used in a clinical study, assisted women in achieving ovulatory cycles when the test preparation was administered at 250–500 mg, 3 times per day, for 3 months.²²

Chasteberry

Chasteberry (*Vitex agnus-castus*) appears to have prolactin-inhibiting effects, among others, and has been used for women who are sterile as a result of secondary amenorrhea and luteal insufficiency.²³ The herb seems to normalize luteal-phase defects and may increase the chances of becoming pregnant for women with relative progesterone deficiency.

For women with hyperprolactinemia, vitex was shown to suppress prolactin release, lengthen luteal phases, and improve progesterone synthesis after 3 months of treatment.²⁴

In another study, 120 women with polymenorrhea, oligomenorrhea, and corpus luteum insufficiency were treated with a standardized extract of vitex for 6 months. Sixty (60) percent of these women had sought conception assistance previously. During the study, the women's progesterone levels were increased from an average of 6.4 ng/mL to 9.3 ng/mL while

64 percent of the women's cycles became normalized and 29 percent of the women became pregnant.²⁵

Two Chinese Herbal Preparations

Shakuyaku-Kanzo-To, a Chinese botanical combination of extracts from *Paeoniae* radix and *Glycyrrhizae* radix has been used to lower elevated testosterone levels in a number of settings.²⁶ When this preparation was given to subjects at a dose of 5–10 mg per day for 2–8 weeks, women with elevated circulating levels of androgens had significant lowering of testosterone. Six (6) of the 7 subjects in this study began ovulating regularly and 2 of them were able to conceive.²⁷

Zhibai Dihuang, another Chinese formula (comprised of the herbs Anemarrhena, Phellodendron, and Rhemannia) and given in pill form, has shown promise for helping couples with antisperm and/or anti-zona pellucida antibodies. Infertile couples were treated with this formula; following treatment antibody conversion to negative was at 81.3 percent of the infertile couple subjects in the study.²⁸ Moreover, in the 1–9 months following the study, all 8 previously immunologically infertile couples were able to conceive, and the women's antibody status remained negative throughout their pregnancies.

Conclusions

This paper provided information on a short list of female-specific, reproductive-focused botanical and nutritional medicines that may be used to help woman become pregnant via regulation of reproductive organ function.

Botanical medicines offer an opportunity to treat each woman as an individual to address her specific cause of infertility. This approach serves patients best, especially when dealing with multiple confounders, such as those that occur in infertility.

Lifestyle factors are "fertile ground" for addressing numerous causes of infertility. One can examine each woman's diet, place of work, home environment, and other lifestyle choices to give her

Botanical medicines offer an opportunity to treat each woman as an individual to address her specific cause of infertility.

options for achieving adequate nutrition. A balanced and varied diet is essential and optimal amounts of the key supplements are also important for helping women achieve conception. This is vital in addition to examining other avenues for addressing infertility fully to help women prepare their bodies for the miracle of conception. □

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