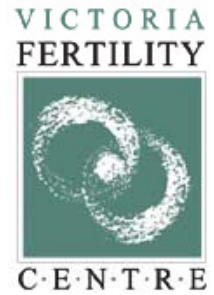


VFC InfoSheet : MALE FACTOR SUBFERTILITY



INTRODUCTION

Approximately 30-50% of all subfertility may be due to a significant male factor. There can be a number of reasons for poor sperm quality.

Sperm production: This process, which takes place in the testes is called spermatogenesis. It takes 10 weeks from division of the stem cells until a spermatozoon is released within the testis, and a further 2–3 weeks for it to mature (in a tubular structure attached to each testes called the epididymis) before it is ready to be ejaculated. Therefore, the whole process takes about 3 months, and anything that affects normal functioning of the testes or epididymides can affect the quantity or the quality of the sperm produced. A normal fertile man produces around 80 to 100 million sperm per day (i.e. about 1000 per second!) and lower rates can cause subfertility. The differentiation of the cells that give rise to spermatozoa is the most highly complex in the body and if anything goes wrong with even a part of the process it could cause the resulting spermatozoon to be abnormal and/or unable to function properly.

Factors which effect sperm counts and quality

1. Lifestyle: There are certain lifestyle choices that adversely affect sperm. The most common of these are smoking cigarettes and marijuana, and excessive alcohol use. If the testes are exposed to high temperatures for prolonged periods of time, sperm can be adversely affected. Men who may be at risk would be those who drive heavy-duty machinery, long-haul trucks or taxis, as well as bakers and frequent users of hot tubs.

- 2. The presence of a varicocele:** The reason that the testes lie outside the body in a scrotum is to keep them cool. In certain circumstances (about 15% of all men) there may be dilated blood vessels around the testis in the scrotum, which subject the testes to higher temperatures. Sometimes these dilated blood vessels, which are called varicoceles, can be felt clinically, but in other cases they may be identified only by a specialized form of ultrasound (“Doppler”). Surgical correction of varicoceles may potentially improve sperm quality. A varicocele may be treated surgically by a urologist, or alternatively, they can be embolized (blocked off using foam) by an interventional radiologist.
- 3. Medications:** Certain medications may adversely affect sperm production and/or function. The most well known of these is sulfasalazine, which is used for the treatment of inflammatory bowel disease, but calcium channel blockers have also been reported to impair fertilization. Calcium channel blockers are commonly used to treat hypertension.
- 4. Fever:** When you have a fever the body’s “core” temperature is increased and this can also affect the proper function of the testes and epididymides. Because the whole process of sperm production takes 12–13 weeks, it is important to know if you had any illness (e.g. the flu) that caused a fever during that period before your semen analysis was done.
- 5. Age.** There are some changes which occur with age, though the effects of age on sperm function and quality is considerably less than the effects that age has on a

woman's eggs.

- 6. Genital infections.** Certain infections can damage sperm. If there are more than 1 million white blood cells per ml. of semen it can suggest that there is an infection in the sex glands eg. The testis, epididymis or prostate gland.
- 7. Immune disorders.** Sometimes the body can make antibodies against sperm. These can bind to various parts of the sperm and damage them.
- 8. Testicular cancer.** Although an uncommon cause for subfertility, testicular cancer is not uncommon in men between the ages of 20 and 40 years.
- 9. Genetic abnormalities.** Male subfertility may be caused by a variety of genetic disorders. These types of genetic conditions include Kallman syndrome, cystic fibrosis, CBAVD (congenital bilateral absence of the vas deferens. The vas deferens are the tubes that carry the sperm from the epididymis to the outside), polycystic kidney disease, myotonic dystrophy, androgen insensitivity and Usher syndrome.

Chromosome abnormalities can be numerical (either a chromosome is missing or there is an extra one or part of one) or structural (i.e. physical damage to a chromosome such as a break) and usually result from mutations in the parental germ cell line. Common chromosome causes for subfertility include Klinefelter syndrome, 47XYY, Noonan and Prader-Willi syndromes. If there is a rearrangement of chromosomes (or "translocation") that is balanced, meaning that all the genetic information is conserved, there might be no clinical problems whatsoever – except decreased fertility and the possible risk of abnormalities in any offspring. Balanced translocations occur in 1-in-500 individuals. Unlike the syndromes listed above, most individuals with balanced translocations are otherwise completely

normal in all respects.

INVESTIGATION OF THE MALE

The most basic investigation is a semen analysis. A specimen of semen is produced by masturbation, and analyzed by a laboratory. Because sperm assessments are very complex, will be affected by heating or cooling the semen sample, and must be done very soon after collection of the ejaculate, they must be done by a laboratory with particular expertise in this area. Therefore, it is important that sperm assessments are done at a laboratory that specializes in this work (an "andrology lab") rather than general pathology labs.

Unfortunately, a basic semen analysis is an imperfect way of predicting fertility. In fact, for natural conception, the predictive power of conventional semen characteristics is often less than those of age and duration of subfertility. Nonetheless, it is a good starting point. Medical science is constantly looking for laboratory tests that will improve our ability to predict a sperm's ability to fertilize an egg. Important characteristics include the total sperm count, the motility of the sperm and, most importantly, the morphology of the sperm. (Morphology refers to the actual structural anatomy of the sperm themselves.) Further investigation of a man with a suspected fertility problem may be required by a urologist and additional specialized testing might be indicated depending on the specific history, as well as the sperm parameters and clinical findings.

At the VFC we perform a specialized panel of sperm tests called the Sperm Functional Assessment or "SFA". This intensive assessment allows us to help you make better decisions about the best options for treatment.

Other investigations apart from a semen analysis may include the following:

- 1.Semen culture
- 2.Testing for anti sperm antibodies
- 3.Hormone tests
- 4.Chromosome (genetic)testing
- 5.Scrotal ultrasound to exclude a varicocele
- 6.Transrectal ultrasound to check the prostate and draining tubes

OPTIONS FOR TREATING MALE FACTOR SUBFERTILITY

- 1. Varicocele repair.**
- 2. Medications:** In a very few situations, certain medications may improve sperm production or quality. Many supposed treatments are, in fact, not effective.
- 3. Antioxidants:** It has been shown that the use of certain antioxidants can improve sperm quality and function. The following Vitamins and antioxidants are suggested - Vitamin C 500 mg daily, Folic acid 2 mg daily, Vitamin E 400 iu daily, Selenium 200 mcg daily and extra zinc. It is suggested that extra zinc – up to 50 mg daily – is taken, however for no longer than 3 or 4 months.
- 4. Nutritional supplements.** L-carnitine (Proxeed) has been marketed as a possible nutritional supplement to improve sperm function. Its effectiveness is unknown.
- 5. Intracytoplasmic sperm injection (ICSI):** This is the most “high-tech” variant of IVF in which a single sperm is injected into an egg. In some cases sperm can be recovered from an ejaculate, while in others it might be necessary to aspirate sperm from either the epididymis or even from the testis itself.
- 5. Donor insemination (DI):** Cryobanked sperm from an anonymous donor is placed in the uterus close to the time of ovulation. This procedure is sometimes called artificial insemination using donor sperm (“AID” – although this acronym is no longer used since the advent of AIDS) and sometimes as “therapeutic donor insemination” or TDI.