What's Up With Male Fertility?

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Male reproductive medicine has evolved significantly over the past few decades. Techniques now allow sperm to be found where there was previously no hope, and endocrine therapy is progressing similar to stimulation protocols for the female. This presentation will review the current state-of-the-art in the evaluation and treatment of the infertile male.

Sperm production in the testis leads to 4 viable haploid sperm cells for each progenitor stem cell, unlike in the female. This process is constantly ongoing after puberty, and each fully formed sperm requires 2-3 months to make. Sperm mature in the epididymis, and then transit a ductal system to be mixed with secretions from the prostate and seminal vesicles before exiting. Dysfunction can occur at any point.

Key to understanding the evaluation and treatment of male infertility is to understand male reproductive endocrinology. Gonadotropin-releasing hormone, or GnRH, luteinizing hormone, or LH, and follicle stimulating hormone, or FSH, control testicular steroidogenesis and spermatogenesis. Interestingly, estrogen functions in both genders as the negative feedback moiety. Therapies based on this system include: inhibitors of estradiol binding at the hypothalamus and pituitary such as clomiphene and tamoxifen; aromatase inhibitors such as anastrozole and testolactone; the LH homolog human chorionic gonadotropin, or HCG; and FSH homologs such as recombinant FSH, or rFSH, and human menopausal gonadotropin, or hMG. Testosterone binds to sex hormone binding globulin, or SHBG. Free testosterone assays are not uniformly reliable, but bioavailable testosterone can be calculated from total testosterone, SHBG and albumin. A web calculator and smartphone app are available.

With the introduction of the 5th edition of the WHO laboratory manual for the evaluation and processing of human semen, more of an emphasis is placed on overall statistical assessment of bulk seminal parameters; however, the change to the 5th centile as emphasis has been very confusing to many practitioners. Another change was to employ strict morphology as the basic method for sperm shape, and correlating this metric to reproductive outcomes has proven inconclusive. Other useful tests include the pyospermia stain and the live/dead stain.

Surgery for obstruction and for finding sperm in failing testes has also progressed significantly. Microsurgical techniques for microductal reconstruction, for varicocelectomy, and for extracting sperm from the testis are now the primary procedures used by specialists in the field. Differentiating azoospermia from obstruction or from a failing testis is no longer performed by biopsy: FSH and testis longitudinal axis is used instead. Sperm found from any source is routinely frozen for future use, providing a couple knowledge of whether the biological male gamete exists prior to IVF. Endocrine stimulation protocols for the male improving extraction outcomes are useful and improving. We've come a long way in male reproductive medicine and surgery, and we still have a long way to go. But many more babies are born today that would not have been possible even a few years ago, and the future of this field is very promising.