Management of Male Factor Infertility

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Introduction

- Infertility: Inability to conceive of 12 months duration despite adequate unprotected intercourse
- 10-15% of couples
- Male factor contributes to 30-40% of cases
- It is defined by abnormal semen parameters but may be present even when the semen analysis is normal

Why to Evaluate ?

- Identify and treat the cause
- Detection of genetic abnormalities
- Identify underlying medical conditions

Indications for evaluation

- For couples who fail to achieve pregnancy after at least 12 months of regular unprotected intercourse
- Earlier evaluation:
  - Women older than 35 years
  - Medical history or physical examination
- Males having concerns about their future fertility

Initial evaluation

- Detailed reproductive history
- At least one semen analysis

Reproductive history

- Duration of infertility and prior fertility
- Coital frequency and timing
- Childhood illnesses and developmental history
- Systemic medical illnesses
- Previous surgery
- Medication and allergies
- Sexual history
- Exposures to gonadal toxins

Semen analysis

- Pre-test abstinence interval
- Method of collection

- ***Semen volume (> 1.5 ml)***
- ***Sperm concentration (> 15 M/ml)***
- ***Percent motile (40%)***
- ***Forward progression (32%)***
- ***Normal morphology (> 4%)***

Defective parameters

- **Low volume**
  - Short abstinence period, hypogonadism
- **Low volume, low pH, low fructose**
  - Ejaculatory duct obstruction
  - Seminal vesicles produce 50% of semen volume, fructose and alkaline secretion
- **Oligospermia**
  - Likelihood of male infertility increases 5-folds when count <13.5 M/ml
- **Asthenospermia**
  - Likelihood of male infertility increases 5-folds when motility <32%

Defective parameters

- Teratozoospermia
  - Strict sperm morphology [Kruger] is the best predictor of sperm function (capacity to fertilize)
  - Conventional fertilization
    - Highest (>90%) when ≥14% normal forms
    - Lowest (7-8%) when ≤4% normal forms
- Hyperviscosity
  - Associated at times with asthenospermia
  - Suggests dysfunction in accessory glands
  - Little importance

Complete evaluation

- Medical history
- Physical examination
- Tests and procedures

Endocrine evaluation

- Indications:
  - Low sperm concentration
  - Impaired sexual function
  - Clinical findings suggestive of specific endocrinopathy

- Hormonal evaluation (FSH, Te, LH, PRL, TSH)

Endocrine evaluation

- Hypogonadotropic hypogonadism [low test; low FSH]
  - Successful medical treatment
  - Combination of gonadotropins and HCG
- Eugonadotropic hypogonadism [low test; nl FSH]
  - Aromatase inhibitors

Endocrine evaluation

- Hypergonadotropic hypogonadism [high FSH]
  - No beneficial medical treatment
- Eugonadotropic eugonadism [nl test; nl FSH]
  - No beneficial medical treatment [androgens, gonadotropins, clomiphene citrate, tamoxifen, vit E, selenium, L-carnitine]

Post-ejaculatory Urinalysis

- Low-volume or absent antegrade ejaculation
  - Incomplete semen collection
  - Ejaculatory duct obstruction
  - Hypogonadism
  - CBAVD
  - Retrograde ejaculation

Other Tests

- Ultrasonography (TRUS, Scrotal USS)
- Quantitation of Leucocytes in semen
- Tests for Antisperm Antibodies
- Sperm Viability Tests

Sperm DNA Fragmentation Tests

- Denatured or damaged DNA that cannot be repaired
- Due to intrinsic or extrinsic factors
- Direct methods (Comet, TUNEL) analyze the number of breaks in DNA
- Indirect methods (SCSA) define abnormal chromatin structure
- It is not routinely recommended
- No treatment for abnormal DNA integrity
- Varicocele repair, antioxidants use may affect sperm DNA integrity
- Sperm retrieved from the testis has better DNA quality in patients with abnormal ejaculated sperm DNA integrity

Specialized Tests

- Sperm penetration assay
- Acrosome reaction of human sperm
- Biochemical tests (Sperm creatine kinase, ROS)
- Tests for selecting sperms for ICSI (Hyaluronic acid binding, apoptosis evaluation, IMSI)

Genetic Screening

- In men with non-obstructive azoospermia and severe oligozoospermia

- Genetic tests:
  - Karyotyping
  - Y-chromosome microdeletions
  - Cystic fibrosis gene mutation

Male Factor Treatment

- **Treat the cause:**
  - Sexual dysfunction
  - Hyperprolactinemia
  - Thyroid disorders
  - Medication
- **Hypogonadotropic Hypogonadism**

Male Factor Treatment

- Antioxidants
- L-Arginine
- L-Carnitine
- Aromatase inhibitors

Male Factor Treatment

- **ART**
  - **IUI**
  - **IVF (ICSI)**


Thank you