

Male Infertility

Overview:

Approximately 15% of couples fail to conceive after one year of unprotected intercourse. One third of cases are due to isolated male factor infertility, another third is caused by female factors. The other third is caused by combination. Hence, ideally both male and female side of the couple should be assessed simultaneously.

Definition of Infertility:

It is the inability of a couple to achieve a recognized pregnancy after one year of unprotected regular intercourse. If there is no prior pregnancy it is called primary infertility. If it occurs after a previous recognized pregnancy then it is called secondary infertility.

Aetiology:

The main causes of male infertility include:

1. Testicular defect.
 - a. Chromosomal abnormalities (eg. Klienfilter's syndrome)
 - b. Microdeletion of chromosome Y
 - c. Cryptorchidism
 - d. Mumps orchitis
 - e. Drugs and radiation damage
 - f. Pollution and occupational exposure
 - g. Testicular varicocele
 - h. Smoking
 - i. Idiopathic
2. Vasal or epididymal obstruction
 - a. Congenital absence of vas deferens
 - b. Surgical injury to the vas or epididymis
 - c. Epididymitis
3. Endocrine abnormlities.
 - a. Hypogonadism

- b. Hyperprolactinemia
- ④. Sexual Dysfunction:
 - a. Erectile dysfunction
 - b. Ejaculatory failure
- ⑤. Systemic Pathologies:
 - a. Diabetes
 - b. Cancer
 - c. Systemic infections

Evaluation of The Infertile Male:

The full evaluation for male infertility should include a complete medical and reproductive history, a physical examination and at least two semen analyses.

①. Medical History:

The history should include search for the above listed causes plus the following:

1. Duration, frequency and timing of unprotected intercourse
2. A complete medical and surgical history.
3. A review of medications and allergies
4. A review of life style, smoking and occupational exposure
5. Family reproductive history
6. A survey of past infections as sexually-transmitted diseases and respiratory infections

②. Physical Examination:

A general physical examination is integral in the assessment of infertile male. In addition to general physical examination, a particular focus should be given to the genitalia including:

1. Examination of the external urethral meatus
2. Palpation of the testes and assessment of their size.
3. Presence and consistency of the vasa and epididymides.
4. Examination for testicular varicocele
5. Secondary sex characters including body habitus, hair distribution and breast development.
6. A digital Rectal Examination

③. Semen Analysis:

Semen analysis is the cornerstone of the laboratory evaluation of the infertile male and helps to define the severity of the male factor. The semen analysis provides information on semen volume as well as sperm concentration, motility and morphology.

SEMEN ANALYSIS-W.H.O. 2010 REFERENCE RANGES

Ejaculate Volume	1.5-5.5mL
Sperm Concentration	$>14 \times 10^6$ sperm/mL
Motility	$>43\%$
Forward Progression	2 (scale 1-4)
Morphology	$>4\%$
Also: No agglutination (clumping), white cells, or increased viscosity	

D. Other investigations:

1. Endocrine evaluation: abnormalities of the hypothalamic-pituitary-testicular axis are important but uncommon causes of male infertility. They are indicated when there is:

- Abnormal semen analysis especially if sperm count is less than 10million/mL
- Impaired sexual function.
- Other clinical findings suggestive of endocrinopathy.

2. Post-ejaculatory urinalysis: to detect cases of retrograde ejaculation.

3. Ultrasonography:

- Trans-Rectal Ultrasound (TRUS). To assess for seminal vesical abnormalities.
- Scrotal Ultrasound

4. Other specialised tests on sperms, semen and DNA testing

E Female side assessment: The female should also be assessed. It is important to remember that female fertility declines from the age of 35 years in a way that is not true for males.

Management of Male Infertility:

1. Genreal Measures:

- Life-style changes: Patients are encouraged to stop smoking and to limit environmental and occupational exposure to harmful substances.
- A diet rich in anti-oxidants such as Vitamin C & E has been proposed to improve the quality of sperms by decreasing the level of free-radicals that may cause sperm damage. The use of fish oil and selenium is also of benefit.
- Stress-relief therapy and proper psychological assessment is important.
- Infections should be treated by appropriate antimicrobial.

2. Medical Care: Limited numbers of medical treatment can be used:
- Appropriate correction of endocrinopathy
 - Immunosuppression for anti-sperm antibodies
 - Dietary suppliments and vitamins
3. Surgical Care: To correct the surgically-correctable abnormalities such as varicoceles or vasal obstruction.
4. Assisted Reproductive Techniques (ART): This include multiple approaches of treatment ranging from injection of the sperms into the female genital system (artificial insemination) to retrieval of both ova and sperms and fertilizing them outside the body (In vitro fertilization). The fertilized embryo is then replaced into the female reproductive tract. The high cost and technical difficulty of these procedures precludes their use as a first line therapy.
5. A genetic &/or endocrinology assessment may be required.

Laparoscopy in Urology

Introduction:

Laparoscopy has become recently a practical and acceptable alternative to treat complex surgical urological diseases. With the ongoing development in this field, it would probably replace open surgical procedures one day.

Advantages:

There are a number of advantages to the patient with laparoscopic surgery versus an open procedure. These include:

- Reduced hemorrhage, which reduces the chance of needing a blood transfusion.
- Smaller incision, which reduces pain and shortens recovery time, as well as resulting in less post-operative scarring and better cosmesis.
- Less pain, leading to less pain medication needed.
- Although procedure times are usually slightly longer, hospital stay is less, and often with a same day discharge which leads to a faster return to everyday living.
- Reduced exposure of internal organs to possible external contaminants thereby reduced risk of acquiring infections.

Approaches:

Basically there are three main approaches in urologic laparoscopy:

- ① Transperitoneal Approach: It is the traditional method used that provides an optimal working space and facilities. Commonly performed procedures:
 - a. Simple nephrectomy
 - b. Deroofing of simple cyst
 - c. Renal and ureteric stone
 - d. Radical nephrectomy
 - e. Live-donor nephrectomy
 - f. Pyeloplasty
 - g. Nephro-ureterectomy
 - h. Adrenalectomy
 - i. Orchidoexy
2. Retro-peritoneal Approach: This approach is more difficult than the transperitoneal approach. Patients with previous abdominal surgery and adhesions may benefit from this approach.
3. Hand-Assisted Technique: This represents a bridge between laparoscopic and open surgery. It allows the surgeon to use the tactile feedback and use his hand to assist in dissection.

Limitations of Laparoscopy:

1. Loss of depth and tactile perception
2. Increased tremor
3. Decrease range of movement
4. Longer operative time.

Recent Advances:

1. Single site laparoscopy
2. Natural orifice laparoscopy
3. Robotic systems