Sterility and infertility

MUDr. Bianka Némethová
• **Sterility** is a term applied when there is an absolute factor preventing reproduction.

• **Infertility** is defined by the failure to achieve a successful pregnancy after 12 months or more of regular unprotected intercourse (American Society for Reproductive Medicine [ASRM], 2008).
Chances of conception

• People who are concerned about their fertility should be informed that over 80% of couples in the general population will conceive within 1 year if:
  - the woman is aged under 40 years
  - they do not use contraception and have regular sexual intercourse.

• Half of those who do not conceive in the first year will do so in the second year (cumulative pregnancy rate over 90%)
Factors affecting Fertility

- **Frequency/Timing of sexual intercourse:**
  - Every 2 to 3 days optimises the chance of pregnancy

<table>
<thead>
<tr>
<th>Frequency of intercourse</th>
<th>Probability of conception (within 6 months)</th>
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<tbody>
<tr>
<td>1 time per week</td>
<td>17 %</td>
</tr>
<tr>
<td>3 times per week</td>
<td>50 %</td>
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</table>

- **Obesity:**
  - Women who have BMI of over 30 should be informed that they are likely to take longer to conceive and will affect treatment success rates.
Factors affecting Fertility

• Low body weight
  - Women with BMI less than 19 and irregular menstruation should be counselled to gain weight

• Smoking
  - Strong association between smoking and fertility in both partners
  - Affects success rates of ARTs
Factors affecting Fertility

• Caffeinated beverages:
  - No evidence on effect of caffeine on fertility

• Alcohol
  - Female patients should be informed that 1 or 2 units of alcohol once or twice per week reduce the risk of harming a developing fetus
  - Intoxication may affect semen quality
Factors affecting Fertility

- Prescribed, over-the-counter and recreational drug use

- **Tight underwear**
  - There is an association between elevated scrotal temperature and reduced semen quality

- **Complementary therapy:**
  - No evidence supporting any
Causes

- It is estimated that infertility affects 1 in 7 heterosexual couples in the UK.

- In about 40% of cases disorders are found in both the man and the woman.
CAUSES OD FEMALE INFERTILITY

1. OVULATION DISORDERS CAUSES:

• AGING
• DIMINISHED OVARIAN RESERVE
• PREMATURE OVARIAN FAILURE
• ENDOCRINE DISORDERS (PCOS)
CAUSES OF FEMALE INFERTILITY

2. Tubal causes

• Pelvic inflammatory disease
• Tubal surgery
• Previous ectopic pregnancy
• Salpingectomy
3. UTERINE/CERVICAL CAUSES

- CONGENITAL UTERINE ANOMALY
- FIBROIDS
- ENDOMETRIOSIS
- POOR CERVICAL MUCUSE QUANTITY/QUALITY
- INFECTION
CAUSES OF MALE INFERTILITY

• CONDITIONS THAT AFFECT QUALITY AND QUANTITY OF SPERM
• VARICOCELE
• PRIMARY TESTICULAR FAILURE
• ACCESSORY GLAND INFECTION
• IDIOPATHIC LOW SPERM MOTILITY
CAUSES OF INFERTILITY AFFECTING BOTH PARTNERS

1. Psychological
   • Sexual behavior may reflect couples desire not to have children

2. Immunological incompatibility
   • May cause sperm agglutination

3. Unknown causes
Basic Work-up for Infertility

Evaluating both partner is essential !!!

✓ Detailed history and physical examination
✓ Semen analysis
✓ Evidence of ovulation
  (Day 2-3 gonadotrophins, Day 21 progesterone)
✓ Evidence of fallopian tubes patency
GENERAL AND SEXUAL HISTORY

GENERAL HISTORY:
- OCCUPATION AND BACKGROUND
- USE OF TOBACCO, ALCOHOL AND DRUGS
- HISTORY OF ABDOMINAL SURGERY AND EARLIER DISEASES/INFECTIONS

SEXUAL HISTORY:
- SEXUAL DISTURBANCE OR DYSFUNCTION SUCH AS VAGINISMUS, DYSPAREUNIA OR ERECTILE DYSFUNCTION
- SEXUALLY TRANSMITTED INFECTIONS
OBSTETRIC AND GYNECOLOGICAL HISTORY

✓ REPRODUCTIVE HISTORY
✓ GYNECOLOGICAL HISTORY
✓ AGE AT MENARCHE
✓ MENSTRUAL PERIODS: DURATION AND INTERVALS
✓ PREVIOUS CONTRACEPTIVE USE
✓ PREVIOUS TESTING AND TREATMENT FOR INFERTILITY
GENERAL AND GYNECOLOGICAL EXAMINATION

VISUAL EVALUATION AND PELVIC EXAM FOR WOMAN TO RULE OUT:

✓ ENDOCRINOPATHY
✓ CONGENITAL ANOMALIES
✓ UTERINE HYPOPLASIA
✓ CERVICAL LESIONS
✓ DYSPAREUNIA

VISUAL EVALUATION AND PENIS EXAM FOR MEN TO RULE OUT:

✓ Hypogonadism
✓ Tumors
✓ Epididymal cyst
✓ Cryptorchidism
✓ Hydrocele
✓ Varicocele
# Semen analysis

## WHO reference values changed

<table>
<thead>
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<tbody>
<tr>
<td><strong>Volume (mL)</strong></td>
<td>ND</td>
<td>≥2</td>
<td>≥2</td>
<td>≥2</td>
<td>≥1.5</td>
</tr>
<tr>
<td><strong>Count (10^6/mL)</strong></td>
<td>20-200</td>
<td>≥20</td>
<td>≥20</td>
<td>≥20</td>
<td>≥15</td>
</tr>
<tr>
<td><strong>Total count (10^6)</strong></td>
<td>ND</td>
<td>≥40</td>
<td>≥40</td>
<td>≥40</td>
<td>≥39</td>
</tr>
<tr>
<td><strong>Motility (%)</strong></td>
<td>≥60</td>
<td>≥50</td>
<td>≥50</td>
<td>≥50</td>
<td>≥40</td>
</tr>
<tr>
<td><strong>Progressive (%)</strong></td>
<td>≥2</td>
<td>≥25%</td>
<td>≥25% (a)</td>
<td>≥25% (a)</td>
<td>≥32%</td>
</tr>
<tr>
<td><strong>Vitality (%)</strong></td>
<td>ND</td>
<td>≥50</td>
<td>≥75</td>
<td>≥75</td>
<td>≥58</td>
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<tr>
<td><strong>Morphology (%)</strong></td>
<td>80.5</td>
<td>≥50</td>
<td>≥30</td>
<td>(14)*</td>
<td>≥4*</td>
</tr>
<tr>
<td><strong>Leukocytes (10^6/mL)</strong></td>
<td>&lt;4.7</td>
<td>&lt;1.0</td>
<td>&lt;1.0</td>
<td>&lt;1.0</td>
<td>1.0</td>
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*Strict criteria (Tygerberg); Esteves et al. Urology 2012
Basic Work-up for Infertility

Evidence of ovulation:

1. Menstrual history of regular cycles
2. Serum progesterone in the mid-luteal phase of their cycle (day 21 of a 28-day cycle) even if they have regular menstrual cycles
3. Serum gonadotrophins (follicle-stimulating hormone and luteinising hormone) on Day2-3 especially in irregular periods
Further investigations

- **Ovarian reserve**
  - More important in >35 years old, suspected ovarian failure and to detect response to ovulation induction.

  1. Total **antral follicle count**
  2. **Anti-Müllerian hormone** of less than or equal to 5.4 pmol/l for a low response and greater than or equal to 25.0 pmol/l for a high response
  3. **Follicle-stimulating hormone** greater than 8.9 IU/l for a low response and less than 4 IU/l for a high response.

- **No evidence for:**
  - ovarian volume
  - ovarian blood flow
  - inhibin B
  - oestradiol (E2)
Further investigations

- Investigation of suspected tubal and uterine abnormalities:
  1. **Hystersalpingography (HSG):**
     - usually after failed successive cycles of ovulation induction, and in some centres after failed IUI
     - good predictive but requires expertise
Further investigations

• Investigation of suspected tubal and uterine abnormalities:
  1. Hystersalpingography (HSG):
Further investigations

• Investigation of suspected tubal and uterine abnormalities:
  2. Hysterosalpingo-contrast-ultrasonography
    - TVS scan during which air and saline or a solution of D-galactose is infused into the uterine cavity and observed to flow along the fallopian tubes
    - Requires more expertise
    - Less invasive
Further investigations

- **Laparoscopy:**
  - Invasive procedure
  - to check for pelvic disease; such as endometriosis and to check tubal patency
  - therapeutic as in laparoscopic myomectomy and ovarian drilling

- **Hysteroscopy:**
  - to evaluate uterine cavity
  - in case of repeated failed IVF cycles
  - therapeutic as in intrauterine septum
Further investigations

No role for:

• Post-coital testing for cervical mucous

• Endometrial Biopsy
Summary

• Infertility is a significant medical and social problem affecting couple worldwide.

• It is a sensitive issue that should be handled with great care with continuous professional counselling.

• Most young couples will conceive naturally within 2 years.

• Evaluation of both partners for causes is essential.

• Treatment depends on the cause, and varies from medical treatment to surgery to ART.
References

1. NICE GUIDELINE, CG156, FEBRUARY, 2013.
2. THE HUMAN FERTILIZATION AND EMBRYOLOGY AUTHORITY, HFEA WEBSITE.
3. ESHRE RECOMMENDATION, ESHRE CONFERENCE 2012.
Thanks