



جامعة الأزهر - غزة
AL-AZHAR UNIVERSITY-GAZA



Male reproductive system





Cryptorchidism

- 10% of neonates have undescended testes, but most of these will descend into the scrotum eventually so that the incidence of post-pubertal cryptorchidism is $<0.5\%$.
- 15% of cases have bilateral cryptorchidism.
- 75% of ♂ with bilateral cryptorchidism are infertile.
- 10% risk of testicular malignancy; highest risk in those with intra-abdominal testes.
- Low testosterone and raised gonadotrophins in bilateral cryptorchidism.
- Normal testosterone i.e. normal male characters.
- Descent of testis depends on MIS & Testosterone i.e. (I





Abnormal testicular function

- Hypogonadism

- ✓ Male hypogonadism Definition Failure of testes to produce adequate amounts of testosterone, spermatozoa, or both

- A- Primary

testicular failure with normal hypothalamus and pituitary function.

- ✓ Klinefelter's syndrome (XXY) is the most common congenital cause and is thought to occur with an incidence of 2:1,000 live births.
- ✓ Acquired hypogonadism is even more common, affecting 1:200 ♂.
- ✓ Complete e.g. Castration
- ✓ Partial e.g. Cryptorchidism





- Secondary

- ✓ Hypogonadism as a result of hypothalamic or pituitary dysfunction
- ✓ Low 9 a.m. serum testosterone.
- ✓ Low normal or low LH and FSH, normal inhibin B and anti-Müllerian hormone.
- ✓ Kallmann's syndrome A genetic disorder characterized by failure of episodic GnRH secretion and anosmia. Results from disordered migration of GnRH-producing neurons into the hypothalamus.
- ✓ Incidence of 1 in 10,000 ♂. • ♂:♀ ratio = 4:1





Causes of hypogonadotrophic hypogonadism

- Single gene defects:
 - ✓ Kallmann's syndrome.
 - ✓ Idiopathic hypogonadotrophic hypogonadism (IHH).
 - ✓ Fertile eunuch syndrome.
 - ✓ Congenital adrenal hypoplasia (DAX-1 gene mutation).
- Functional:
 - ✓ Exercise, weight loss, stress, systemic illness.
 - ✓ Iatrogenic: anabolic steroids, opiates.
- Associated conditions:
 - ✓ Haemochromatosis.
 - ✓ CAH, especially ♂.
 - ✓ Pituitary disease: Tumours, e.g pituitary adenoma, craniopharyngioma, germinoma, Infiltrative disorders, e.g. sarcoidosis, haemochromatosis, Head trauma.
- Syndromic:
 - ✓ Prader-Willi syndrome.
 - ✓ Laurence-Moon-Biedl syndrome.
 - ✓ CHARGE syndrome.
 - ✓ X-linked adrenal hypoplasia congenita.





Abnormal testicular function

- Congenital deficiency of 5α reductase: ↓ produce DHT
Effect: male pseudohermaphroditism (46,XY Disorders of Sex Development)
- Disorders of sex development (DSDs): intersex conditions, are seen in infants who are born with ambiguous or abnormal genitalia and may have indeterminate phenotypic sex.





Abnormal testicular function

- Hypogonadotropic eunuchoidism is a well recognized form of familial hypogonadism characterized by selective gonadotropin deficiency and sexual infantilism. Often, olfactory dysfunction or cryptorchidism are also present.





Gynecomastia

- Enlargement of the ♂ breast, as a result of hyperplasia of the glandular tissue, to a diameter of >2cm
- Common; present in up to one-third of ♂ <30 years and in up to 50% of ♂ >45 years.
- Usually bilateral but may be unilateral





Causes of gynaecomastia

- Physiological:
 - ✓ Neonatal: transplacental passage of maternal estrogen
 - ✓ Puberty—about 50% of boys develop transient gynaecomastia.
 - ✓ Men after 50 years – testosterone (androgens)
 - ✓ Idiopathic—about 25% of all cases.
- Drugs (possible mechanisms: oestrogen-containing, androgen receptor blockers, inhibiting androgen production):
 - ✓ Oestrogens, antiandrogens, testosterone.
 - ✓ Spironolactone, ACE inhibitors, calcium antagonists, digoxin. (weak estrogenic)
 - ✓ Alkylating agents.
 - ✓ Alcohol, marijuana, heroin, methadone.
 - ✓ Cimetidine.
 - ✓ Ketoconazole, metronidazole, antituberculous agents, tricyclic antidepressants, dopamine antagonists, opiates, benzodiazepines.
 - ✓ Antiretroviral drugs.
 - ✓ Imatinib (chronic myeloid leukaemia).





Causes of gynaecomastia

- Hypogonadism:
 - 1 p.
 - 2 s.
- Tumours:
 - ✓ Oestrogen- or androgen-producing testicular or adrenal tumours.
 - ✓ Human chorionic gonadotrophin-producing tumours, usually testicular, e.g. germinoma; occasionally ectopic, e.g. lung.
 - ✓ Aromatase-producing testicular or hepatic tumours.
- Endocrine:
 - ✓ Thyrotoxicosis.
 - ✓ Cushing's syndrome.
 - ✓ Acromegaly.
 - ✓ Androgen insensitivity syndromes.
- Systemic illness:
 - ✓ Liver cirrhosis.
 - ✓ Chronic renal failure.
 - ✓ HIV infection.
 - ✓ Malnutrition.





Puberty

Puberty refers to the phase of development between childhood and adulthood in which complete functional maturation of the reproductive glands and external genitalia occurs

Gonads → Gonadotropins → Reproduction

Definition:

Menarche → 1st menstrual cycle

Thelarche → Development of breast

Pubarche → Development of pubic hair

Adrenarche → ++ adrenal androgens (Cortisol and ACTH +/-)

Gonadarche → activation of reproductive glands by the pituitary hormones FSH and LH





Puberty

- Growth spurt: due to change in enzyme system and androgen storm hormone
 - ✓ Female normal age of onset: 8–13 years
 - ✓ Normal order of changes: adrenarche → gonadarche → thelarche (age of onset 8–11 years) → growth spurt (age of onset 11.5–16.5 years) → pubarche (mean age of onset 12 years) → menarche (age of onset 10–16 years ; mean age: 13 years)
 - ✓ Male normal age of onset: 9–14 years
 - ✓ Normal order of changes: adrenarche → gonadarche (age of onset 9–14 years) → pubarche (mean age of onset 13.5 years) → growth spurt (mean age of onset 13.5 years) → androgenic hair growth





Causes of onset of puberty

- Genetic
- Correlation between mother & daughter menarche (loose)
- Geographic localization & exposure to light
- State of nutrition
- Body composition & Fat deposition
Heavy exercise & marked obesity (-- leptin) & anorexia → delay





Control of onset of puberty

- Stoppage of inhibition which prevents pulsatile release of GnRH in children
- During childhood the hypothalamus does not secrete significant amounts of GnRH. One of the reasons for this is that, during childhood, the slightest secretion of any sex steroid hormones exerts a strong inhibitory effect on hypothalamic secretion of GnRH.
- The time of puberty, the secretion of hypothalamic GnRH breaks through the childhood inhibition and adult sexual life begins.

