

Endocrinopathies and Male Infertility

M.A.Sadighi Gilani

Professor in urology

TUMS, Royan

Tehran 1402

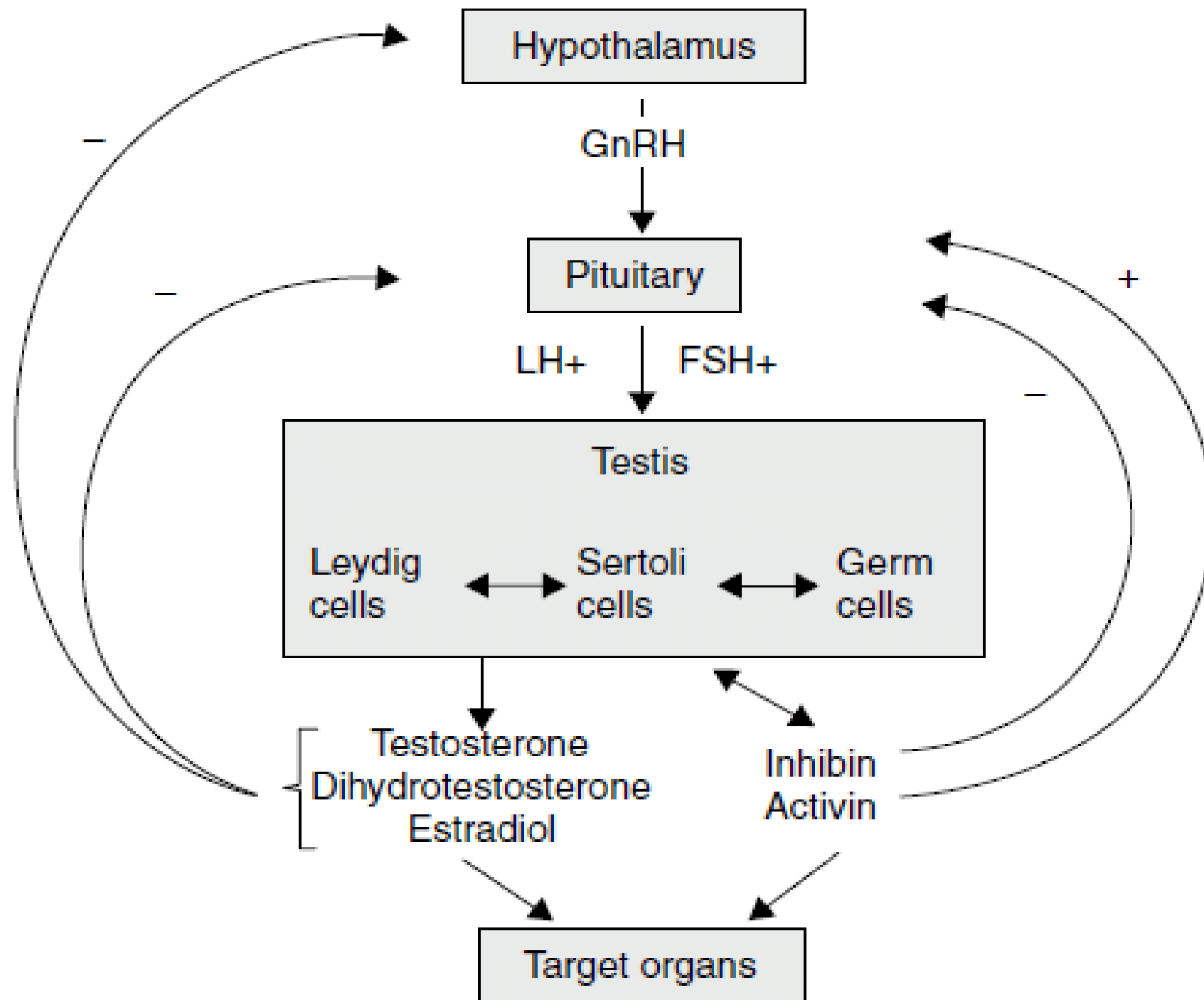
Introduction

- 15% of couples are infertile
- 50% of the global infertility cases involve male factors
- 1% to 2% of male infertility is related to endocrinopathies

• Sangupta 2022

Table 1: Male infertility causes and associated factors and percentage of distribution in 10,469 patients [10]

Diagnosis	Unselected patients (n = 12,945)	Azoospermic patients (n = 1,446)
<i>All</i>	100%	11.2%
<i>Infertility of known (possible) cause</i>	42.6%	42.6%
Maldescended testes	8.4	17.2
Varicocele	14.8	10.9
Sperm autoantibodies	3.9	-
Testicular tumour	1.2	2.8
Others	5.0	1.2
<i>Idiopathic infertility</i>	30.0	13.3
<i>Hypogonadism</i>	10.1	16.4
Klinefelter's syndrome (47, XXY)	2.6	13.7
XX male	0.1	0.6
Primary hypogonadism of unknown cause	2.3	0.8
Secondary (hypogonadotropic) hypogonadism	1.6	1.9
Kallmann syndrome	0.3	0.5
Idiopathic hypogonadotropic hypogonadism	0.4	0.4
Residual after pituitary surgery	< 0.1	0.3



Hormonal Evaluation

- The AUA guidelines do **not** recommend an initial hormone evaluation, but only after abnormal clinical finding or semen analysis
- 1- impaired libido,
- 2- erectile dysfunction,
- 3- atrophic testes, or
- 4- evidence of hormonal abnormality on physical evaluation.
- 5- oligozoospermia or
- 6- azoospermia
- (Expert Opinion)

Which Hormones?

- There is no consensus on how comprehensive this evaluation should be the minimum initial hormonal evaluation should
- include
- FSH
- Total testosterone.
-

Ring 2016

Hypoandrogenism

- If the TT level is low,
- a repeat measurement of TT
- LH, and
- prolactin
- along with free testosterone (FT) or bioavailable testosterone (BT),
-

Sengupta 2022

Table 1. Reports on endocrinopathies and their impact on male reproduction.

Endocrinopathy	Changes in Male Reproduction
Hypogonadotropic hypogonadism (Genetic: Kallman syndrome)	Delayed puberty and infertility caused by a malfunction of GnRH-secreting neurons to migrate; cessation of gonadotropin secretion
Hypergonadotropic hypogonadism	Increased FSH/LH, normal or ↓testis volume, decreased pubic hair and penis size, infertility
Androgen excess	Inhibition to GnRH secretion, normal or ↓FSH, ↓LH,
Estrogen excess	↓T:E2, ↓semen parameters
Hyperprolactinemia	Normal or ↓FSH/LH, ↓testosterone
Insulin disorders	↓spermatogenesis, ↓reduced vacuolization in the Sertoli cells, ↓fertility, ↓semen parameters, ↓Leydig cells count, ↓testosterone

Hypogonadism Definition

- Hypogonadism is defined as a
- low total testosterone level
- (Food and Drug Administration [FDA] normal range, 300–1000 ng/dL)
-

-

Sengupta 2022

Hypogonadism S&S

- that can be associated with clinical findings such as
- 1- decreased libido,
- 2- infertility,
- 3- anemia,
- 4- mood changes,
- 5- alterations in body hair distribution,
- 6- decrease in lean muscle mass
- 7- decrease in bone mineral density.

-

Prolactin

- Normal prolactin levels in men should be less
- than 18 ng/dL, and testing should be repeated if
- the level is elevated, because biologic variability is
- particularly high with this assay.

• Dabbous 2017

Hyperprolactinemia S & S

- may be
- asymptomatic in some cases or lead to
- hypoandrogenic state
- galactorrhea
- reduced libido
- erectile dysfunction are reported in the other cases
- Infertility
- headache
- fatigue
-

Hyperprolactinemia

- can arise as a result of
 - hypothyroidism,
 - liver illness,
 - stress, (physiologic or psychologic)
 - certain drugs (phenothiazines, tricyclic antidepressants , imipramine, methyldopa, and eserpine.)
 - presence of functional pituitary adenomas
 - Idiopathic
 -

Insulin Disorders and Diabetes Mellitus

- According to the American Diabetes Association, about 90% of
- diabetes cases are accompanied by changes in their
- reproductive functions, diminished libido, and infertility or subfertility

-

Condorelli 2018

Pathology

- Neuropathy,
- angiopathy,
- oxidative stress, and
- psychological deviation
- are the important causative factors in developing reproductive dysfunctions in diabetes.

-

Condorelli 2018

DM & Reproductive System

- low testosterone levels
- subnormal free testosterone
- low (LH) and FSH (HH in 30-40% men with DM)
- reduced (SHBG)
- low libido (64%),
- ED (74%),
- ejaculatory disorders
- sperm parameters
- Comorbidities including hypertension, dyslipidaemia, CV disease (CVD), or other endocrine dysfunctions, and their treatments
- psychological issues contributes to impaired sexual function

DM & Fertility

- **50%** of male diabetic patients presented some degree of subfertility or infertility but the prevalence of DM in infertile men is **<1.2%** .
- Alterations in sperm parameters
- histologic damage of the epididymis,
- negative impact on sperm transit
- changes in hormone levels
- can contribute to diabetes-related male infertility.

La Vignera et al, 2009, Delfino et al, 2007

Hyperandrogenism

- The presence of normal to high serum testosterone levels in conjunction with reduced gonadotropins suggests the
- presence of the condition.
- Exogenous
- Endogenous

-

Sussman 2008

Endogenous hyperandrogenism

- 1- Congenital adrenal hyperplasia (CAH) is the most prevalent endogenous cause,
- 2- Functional tumors (adrenal or testicular) and
- 3- Androgen insensitivity disorders.

Sussman 2008

Estrogen Excess S & S

- Infertility
- Gynecomastia
- Erectile Dysfunction

-

Schulster 2016

Estrogen excess

- the ratio of testosterone to estradiol (T:E2), in particular, is a crucial indicator of estrogen excess, with a goal ratio greater than 10:1

- Pavlovich et al, J. Urol. 2001

Thyroid status

- Thyroid diseases, both hyper- and hypofunction,
- can have an adverse impact on male reproduction.

• با تشکر از توجه و حوصله شما