

Occurrence, Etiology, Pathogenesis, Clinic, Diagnostics, Treatment and Prevention of Hyperprolactinemic Hypogonadism in Uzbekistan

Djurayeva Ra'no Xayrulloevna

Department of Fundamental Medical Sciences of the Asian International University. Bukhara, Uzbekistan

Annotation: Hyperprolactinemic hypogonadism is a condition characterized by a decrease in the level of gonadotropins (LG, FSG) and gonadal steroids (testosterone or estrogen) resulting from high levels of the hormone prolactin in the body. This is a hypogonadotropic (central) form of hypogonadism and is mainly associated with the inhibitory effect of prolactin on the hypothalamic-pituitary-gonadal (HPG) axis.

Keywords: prolactinoma, adenoma, hypoglycemia, amenorrhea, galactorrhea, gynecomastia.

Etiology.

The main factors that lead to the development of hyperprolactinemic hypogonadism:

- Prolactinoma: a prolactin-producing adenoma in the pituitary gland. This is the most common cause.
- Pituitary or hypothalamic lesions, invasion or trauma: for example, radiation to the sella turcica, surgery, trauma.
- Pharmacological causes: some drugs can increase prolactin secretion - antipsychotics, antidepressants, painkillers, some hormonal therapies.
- Hypothyroidism: low thyroid hormones can increase prolactin levels.
- Chronic diseases: renal or hepatic failure, hypoglycemia, other general diseases.
- Stress, physiological conditions: sleep, hygiene, physical exertion, stress, chronic insomnia.

Pathogenesis

1. Normal HPG axis activity:

- Hypothalamus → secretes GnRH (gonadotropin-releasing hormone).
- GnRH → stimulates the pituitary gland → LG and FSG secretion increases.
- LG/FSG → stimulates the gonads:

o In women → estrogen, progesterone are produced.

o In men → testosterone is produced.

2. How does hyperprolactinemia disrupt the HPG axis?

A. Suppresses GnRH secretion

- Prolactin acts on the hypothalamus via feedback, reducing the impulsive secretion of GnRH neurons.
- As a result:
 - o The number and amplitude of GnRH pulses are reduced,
 - o This leads to a decrease in the production of FSH and LH.

B. Reduces the sensitivity of gonadotropic cells to GnRH

- Prolactin reduces the responsiveness of gonadotropic cells in the pituitary gland to GnRH,
- This further reduces the secretion of gonadotropins (FSG/LG).

C. Direct gonadal effects (less common)

- In some cases, there is evidence of a direct effect of prolactin on the gonads (ovaries or testes), but this is not the primary mechanism.

Resulting hormonal changes:

Hormonal Change

Prolactin ↑ (increased)

GnRH ↓ (decreased secretion)

LG / FSG ↓ (low levels)

Estrogen / Testosterone ↓ (gonadal hypofunction)

Clinical consequences:

In women:

- Amenorrhea or oligomenorrhea,
- Anovulation → infertility,
- Galactorrhea (milk secretion),
- Decreased libido, vaginal erection.

In men:

- Decreased libido,
- Erectile dysfunction,
- Gynecomastia,
- Decreased testosterone levels → decreased muscle mass, decreased bone density,
- Sometimes galactorrhea (less common).

Diagnosis:

The following are important for the diagnosis of hyperprolactinemic hypogonadism in men:

- Determination of prolactin, LG, FSG and total testosterone levels.
- If prolactin levels are mildly elevated, it may be useful to study the “prolactin/testosterone” ratio. In studies, this ratio helps to predict the presence of pituitary anatomical anomalies.
- MRI examination of the pituitary and hypothalamic area - to determine the presence of adenomas or other structures.
- The status of other hormones, such as thyroid hormones, cortisol, gonadotropins, should be considered, as other endocrine disorders may also play a role.

1. Prolactin: high.
2. LH/FSH: low or low-normal.
3. Testosterone (in men) / Estradiol (in women): low.
4. Pituitary MRI: to exclude prolactinoma or other macroadenoma.
5. TSH, T3/T4: exclude primary hypothyroidism.
6. Other causes: drugs, stress, renal/hepatic insufficiency.

Pathogenetic treatment:

1. Dopamine agonists (main measure):

- Cabergoline, Bromocriptine – stimulate D2 receptors → prolactin decreases.
- After prolactin normalizes:
 - o GnRH secretion is restored,
 - o LH/FSH increases,
 - o Fertility and sexual function improve.

2. In case of prolactinoma:

- Dopamine agonists are the first choice.
- If no response → surgery or radiotherapy.

Prevention

The following preventive measures are recommended to reduce the occurrence of these conditions in men:

1. Strengthening medical examinations

- o Regular monitoring of chronic diseases, liver, kidney diseases, thyroid diseases.
- o Monitoring the side effects of medications (especially antipsychotics, antidepressants) when using them.

2. Reducing stress and maintaining a healthy lifestyle

- o Reducing constant sleeplessness, physical exertion, mental stress.
- o Maintaining a good diet, a sufficient amount of vitamins, especially zinc, magnesium, and a balance of microelements.

3. Rational use of medications

- o Use drugs that increase prolactin levels among pharmaceuticals only when necessary and in minimal doses.
- o Taking special precautions, for example, reminding medical staff that prolactin may increase among the side effects of a drug.

4. Public education and healthy lifestyle

- o Public campaigns on men's health: information on sexual activity, reproductive health, hormones, pregnancy and reproductive age.
- o Dissemination of information through schools, trade unions, health institutions: what low prolactin and testosterone levels mean and how to prevent them.

5. Early detection and treatment

- o Immediately consult an endocrinologist when symptoms such as sexual dysfunction, decreased libido, fatigue, reproductive problems (sterility) appear.
- o Laboratory tests: prolactin, testosterone, LH/FSH and, if necessary, MRI

Conclusions

- Prevention and early diagnosis, control of drug availability and a healthy lifestyle help reduce this situation.
- It is important to strengthen reproductive and endocrine health centers in the health system and expand diagnostic capabilities.

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