HYPROPROLACTINEMIA

Prolactin Deficiency

A deficiency in the serum levels of the prolactin hormone.

 Diablo Diagnosis  ♂ Male & Female

Related Diagnoses:
Thyroid disorders

About Hypoprolactinemia

Hypoprolactinemia is a medical condition characterized by a deficiency in the serum levels of the hypothalamic-pituitary hormone prolactin. Guidelines for diagnosing hypoprolactinemia are defined as prolactin levels below 3 μg/L in women, and 5 μg/L in men (Pic. 1).

Prolactin is involved in several actions, such as lactation, luteal function, reproduction, appetite, suppression of fertility, homeostasis, osmotic balance, immunity, and coagulation. In addition, prolactin is also known as an important factor that mediates adaptive responses related to parental behaviors.

The hypothesis that most prolactin actions in the body can be tied to the adaptation to pregnancy and lactation clearly does not explain effects of prolactin in the male. Up to 40% of the male pituitary gland is dedicated to lactotrophs (cells in the pituitary gland producing prolactin), suggesting that some function is retained in males, but knockout studies have not identified an essential function of prolactin. While there is no male equivalent of lactation, many of the other functions of prolactin in females can also be observed in males. For example, as in females, prolactin seems to be involved in parental behaviour in males.

In the vast majority of hypoprolactinemia, the deficiency occurs secondary to general anterior pituitary dysfunction. Partial isolated hypoprolactinemia (standalone) is rare, and case reports of total isolated prolactin deficiency are rarer still and may have a genetic component (i.e., familial puerperal alactogenesis).

Hypoprolactinemia can result from autoimmune disease, hypopituitarism, growth hormone deficiency, hypothyroidism, excessive dopamine action in the tubero-infundibular pathway (dopamine neurons) and/or the anterior pituitary, and ingestion of drugs that activate the D2 (dopamine) receptor that holds a predominant role in the regulation of prolactin secretion.

A doctor will test for prolactin blood levels in women with unexplained milk secretion or irregular menses or infertility, and in men with impaired sexual function and milk secretion. The treatment option depend the underlying cause for prolactin deficiency.

Associated diseases

- Sheenan’s syndrome (a postpartum necrosis of the pituitary gland)
- menstrual disorders
- thyroid disorders

Complications

Hypoprolactinemia can be a cause of lactation failure after childbirth, also called puerperal alactogenesis. Lack of prolactin is also associated with lower function of immune system.
The hypoprolactemic woman who has undergone in vitro fertilization (IVF) or other fertility treatments may have difficulty breast-feeding following pregnancy. Of course, hypoprolactinemia and failure to successfully breast-feed an infant is common in Sheehan’s Syndrome.

**Risk factors**

- pituitary tumor
- tumor treatment
- head injury
- infection (e.g., tuberculosis, histoplasmosis)
- infiltrative diseases (e.g., sarcoidosis, hemochromatosis, lymphocytic hypophysitis)
- hormonal birth control

**Impact on fertility**

Menstrual disorders, delayed puberty, infertility, and subfertility (a condition of being less than normally fertile though still capable of effecting fertilization) have been associated with hypoprolactinemia, through mechanisms that are not entirely clear. Hypoprolactinemia is also associated with ovarian dysfunction in women, and arteriogenic erectile dysfunction (due to arterial insufficiency), premature ejaculation, oligozoospermia (a semen with low concentration of sperm), asthenospermia (reduced sperm motility), hypofunction of seminal vesicles and hypoandrogenism (deficiency in male sex hormones) in men. In one study, normal sperm characteristics were restored when prolactin levels were raised to normal values in hypoprolactinemic men.

**Prevention**

There is no hypoprolactinemia prevention, but it is appropriate to avoid risk factors if possible.

**Symptoms**

- puerperal alactogenesis (insufficient milk production)
- irregular periods
- metabolic syndrome
- anxiety
- fatigue
- arteriogenic erectile dysfunction (erectile impotence caused by insufficient arterial blood supply)
- premature ejaculation
- oligozoospermia (low concentration of sperm in semen)
- asthenospermia (reduced sperm motility)
- hypofunction of seminal vesicles
- hypoandrogenism in men

**Therapies**

**Self therapy**

There’s no self-therapy or any other alternative therapy that would be verified valid and useful by scientific examination.

**Conventional medicine**

The treatment of hypoprolactinemia is based on treatment of underlying cause, since no medication has been developed to treat hypoprolactinemia itself.
Generally, formula and/or bottle-feeding of infants are recommended for women with puerperal, i.e. occurring during childbirth or the period immediately following, hypoprolactinemia and insufficient milk supply. Drugs to increase milk output generally are not effective.

**Pharmacotherapy**

**Clomiphene citrate**

Clomiphene citrate (50 mg/d for 5 d) or gonadotropins (LH, FSH; dose varies) may be used to treat subfertility caused by hypoprolactinemia.

**Surgical therapy**

Not used.

**Assisted reproduction**

In the case of persistent fertility problems despite hypoprolactinemia treatment, assisted reproductive technology (ART) is the technology used to achieve pregnancy in procedures such as fertility medication, artificial insemination, in vitro fertilization (IVF) and surrogacy. It is reproductive technology used primarily for infertility treatments, and is also known as fertility treatment. It mainly belongs to the field of reproductive endocrinology and infertility, and may also include intracytoplasmic sperm injection (ICSI) and cryopreservation. Infertile couples may also resort to egg/sperm donation or embryo donation when the partner cannot have genetic children because own eggs/sperm cannot generate a viable pregnancy.

If conservative medical treatments fail to achieve a full term pregnancy, the physician may suggest the patient undergo in vitro fertilization (IVF). Prolactin concentration in follicular fluid during in vitro fertilization (IVF) correlates with the oocyte maturation level and fertilization rate. IVF and ART generally start with stimulating the ovaries to increase egg production. Most fertility medications are agents that stimulate the development of follicles in the ovary. Examples are gonadotropins and gonadotropin releasing hormone. After stimulation, the physician surgically extracts one or more eggs from the ovary, and unites them with sperm in a laboratory setting, with the intent of producing one or more embryos. Fertilization takes place outside the body, and the fertilized egg is reinserted into the woman’s reproductive tract, in a procedure called embryo transfer.

Intracytoplasmic sperm injection (ICSI) is beneficial in the case of male factor infertility where sperm counts are very low or failed fertilization occurred with previous IVF attempt(s). The ICSI procedure involves a single sperm carefully injected into the center of an egg using a microneedle. With ICSI, only one sperm per egg is needed. Without ICSI, you need between 50,000 and 100,000.

Infertile couples may also resort to egg donation or embryo donation when the female partner cannot have genetic children because her own eggs cannot generate a viable pregnancy.

**Find more about related issues**

**Diagnoses**

**Thyroid disorders**
A medical condition impairing the function of the thyroid.
Learn more at: [www.fertilitypedia.org/therapy/diag/thyroid-disorders](http://www.fertilitypedia.org/therapy/diag/thyroid-disorders)

**Therapies**
Egg donation
Process by which a woman donates eggs for purposes of assisted reproduction or biomedical research.
Learn more at: www.fertilitypedia.org/edu/therapies/egg-donation

ICSI
A micromanipulative fertilization technique in which a single sperm is injected directly into an egg.
Learn more at: www.fertilitypedia.org/edu/therapies/icsi

Sperm donation
The procedure in which a man (sperm donor) provides his sperm for fertility treatment.
Learn more at: www.fertilitypedia.org/edu/therapies/sperm-donation

Standard IVF
A process in which an egg is fertilised by sperm outside the body: in vitro. Own or donated gametes may be used.
Learn more at: www.fertilitypedia.org/edu/therapies/standard-ivf

Gallery

Pic. 1: Reference ranges of prolactin

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prolactine</td>
<td>µg/L</td>
<td>µg/L</td>
</tr>
<tr>
<td>follicular</td>
<td>12.1</td>
<td>9.2</td>
</tr>
<tr>
<td>phase (n = 803)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>luteal phase</td>
<td>13.9</td>
<td>7.1</td>
</tr>
<tr>
<td>(n = 699)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mid-cycle</td>
<td>17</td>
<td>7.0</td>
</tr>
<tr>
<td>(n = 53)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>whole cycle</td>
<td>13.0</td>
<td>6.2</td>
</tr>
<tr>
<td>(n = 1555)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pregnant, 1st</td>
<td>16</td>
<td>6.9</td>
</tr>
<tr>
<td>trimester (n =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pregnant, 2nd</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>trimester (n =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pregnant, 3rd</td>
<td>113</td>
<td></td>
</tr>
<tr>
<td>trimester (n =</td>
<td></td>
<td></td>
</tr>
<tr>
<td>54)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sources

- Prolactin [https://en.wikipedia.org/wiki/Prolactin] —sourced from Wikipedia licensed under CC BY-SA 3.0
- Assisted reproductive technology [https://fertilitypedia.org/edu/therapies/assisted-reproductive-technology] —sourced from Fertilitypedia licensed under CC BY-SA 4.0
- 60 YEARS OF NEUROENDOCRINOLOGY: The hypothalamo-prolactin axis [http://joe.endocrinology-journals.org/content/226/2/T101.full] —by Grattan licensed under CC BY 3.0
- Interactions between prolactin and kisspeptin to control reproduction [http://www.scielo.br/scielo.php?script=sci_arttext&pid=S2359-39972016000600587] —by Donato Jr. and Frazão licensed under CC BY 4.0
- Prolactin [uploads/1c5e1d335/c5ce1d33ffbf229c3b4492d3243af0b2c22d75ac.png] —by Petráková, created for Fertilitypedia.org licensed under CC BY-SA 4.0