LOW LEVEL OF PROLACTIN

Prolactin Deficiency, Hypoprolactinemia

A condition characterized by a deficiency of prolactin in the blood.

⚠️ Risk factor ♂♂ Male & Female

About Low level of prolactin

Prolactin deficiency (hypoprolactinemia) is a condition characterized by a deficiency of prolactin in the blood. Hypoprolactinemia can result from autoimmune disease, hypopituitarism (deficiency in pituitary hormone production), growth hormone deficiency, hypothyroidism (low thyroid function), excessive dopamine action in the tuberoinfundibular pathway (dopamine neurons) and/or the anterior pituitary.

As a result of decreased prolactin level, men are struggling with poor semen motility and women with lactation failure after childbirth and ovarian dysfunction. The clinical manifestation of prolactin deficiency is probably limited to puerperal alactogenesis (lactation failure after childbirth) that may have a genetic component (i.e., familial puerperal alactogenesis).

Prolactin (PRL) is a protein hormone, as well as a cytokine, which is synthesized and secreted from specialized cells of the anterior pituitary gland, named lactotrophs; however, its synthesis is not limited to the hypophysis since numerous extrapituitary tissues also express this protein, including the placenta, ovary, testis, mammary gland, skin, adipose tissue, endothelial cells, and immune cells. During pregnancy, it stimulates the milk formation. In non-pregnant women, it is secreted in small quantities.

General guidelines for diagnosing prolactin deficiency are defined as prolactin levels below 3 μg/L in women and 5 μg/L in men (Pic. 1). However, different assays and methods for measuring prolactin are employed by different laboratories and as such the serum reference range for prolactin is often determined by the laboratory performing the measurement. Furthermore, prolactin levels also vary factors including age, sex, menstrual cycle stage and pregnancy. The circumstances surrounding a given prolactin measurement (assay, patient condition, etc.) must therefore be considered before the measurement can be accurately interpreted.

To decide the treatment options, discrimination of the cause for prolactin deficiency is important. Typical treatment include D2 (dopamine) receptor antagonists (antidopaminergic) which is a type of drug which blocks dopamine receptors – because dopamine acts as the primary inhibitor of the secretion of prolactin from the anterior pituitary gland.

Symptoms

- puerperal alactogenesis
- anxiety
- asthenozoospermia (low semen motility)
- oligozoospermia (low concentration of sperm in semen)

Associated diseases

- hypogonadism (a diminished function of the testes or ovaries)
- Sheehan syndrome (pituitary infarction)
- hypopituitarism
- hypoandrogenism (low male sex hormones production)
- thyroid disorders

Complications
Hypopituitarism in general can impair secretion of pituitary hormones such as prolactin and growth hormone (GH) and in turn result in lactation failure. D2 receptor antagonists, which are used to treat lactation failure, correct this insufficiency by blocking D2 receptors in the anterior pituitary, which in turn disinhibits prolactin release.

**Risk factors**

- medication (i.e., dopamine infusion, ergot preparation, pyridoxine, diuretics)
- cigarette smoking
- eating disorders
- pituitary tumor
- head injury
- infection (e.g., tuberculosis, histoplasmosis)
- infiltrative diseases (e.g., sarcoidosis, hemochromatosis, lymphocytic hypophysitis)
- hormonal birth control

**Prevention**

There is no prevention for low levels of prolactin although the risk could be decreased by avoiding the risk factors.

**How it can affect fertility**

Hypoprolactinemia is associated with ovarian dysfunction in women meaning that ovaries do not regularly release eggs and do not produce enough sex hormones. In men, arteriogenic erectile dysfunction (due to arterial insufficiency), premature ejaculation, oligozoospermia, asthenospermia, hypofunction of seminal vesicles, and hypoandrogenism may be the reason for insufficient quality of semen and thus affecting fertilizing ability.

In addition, prolactin is also known as an important factor that mediates adaptive responses related to parental behaviors.

**Prognosis**

Abnormally low levels of prolactin cause an inability to breastfeed. Drugs elevating prolactin levels are given to ensure the breastfeeding. In men, low level of prolactin is associated mainly with diminished sperm motility. However, treatment is effective in eliminating symptoms.

**Find more about related issues**

**Diagnoses**

- **Erectile dysfunction**
  The inability (that lasts more than 6 months) to develop or maintain an erection of the penis during sexual activity.
  Learn more at: [www.fertilitypedia.org/therapy/diag/erectile-dysfunction](http://www.fertilitypedia.org/therapy/diag/erectile-dysfunction)

- **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)
## Pic. 1: Reference ranges of prolactin

<table>
<thead>
<tr>
<th>Prolactine</th>
<th>(\mu g/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>Follicular phase (n = 803)</td>
<td>12.1</td>
</tr>
<tr>
<td>Luteal phase (n = 699)</td>
<td>13.9</td>
</tr>
<tr>
<td>Mid-cycle (n = 53)</td>
<td>17</td>
</tr>
<tr>
<td>Whole cycle (n = 1555)</td>
<td>13.0</td>
</tr>
<tr>
<td>Pregnant, 1st trimester (n = 39)</td>
<td>16</td>
</tr>
<tr>
<td>Pregnant, 2nd trimester (n = 52)</td>
<td>49</td>
</tr>
<tr>
<td>Pregnant, 3rd trimester (n = 54)</td>
<td>113</td>
</tr>
<tr>
<td>Male</td>
<td></td>
</tr>
<tr>
<td>21–30 (n = 50)</td>
<td>9.2</td>
</tr>
<tr>
<td>31–40 (n = 50)</td>
<td>7.1</td>
</tr>
<tr>
<td>41–50 (n = 50)</td>
<td>7.0</td>
</tr>
<tr>
<td>51–60 (n = 50)</td>
<td>6.2</td>
</tr>
<tr>
<td>61–70 (n = 50)</td>
<td>6.9</td>
</tr>
</tbody>
</table>

### Sources

- [Prolactin](https://en.wikipedia.org/wiki/Prolactin) — sourced from Wikipedia licensed under CC BY-SA 3.0
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- [Prolactin](https://uploads/c5c/e1d/335/c5ce1d335ffbf29c3b4492d3243af0bc22d75ae.png) — by Petráková, created for Fertilitypedia.org licensed under CC BY-SA 4.0