

The Challenge of Prolactin

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Prolactin (PRL) is a polypeptide hormone made and secreted from the anterior pituitary gland. In concert with other hormones, PRL promotes breast development in preparation for milk production during pregnancy. Prolactin levels climb steadily to ten or twenty times its former values then drop down to normal after delivery in non-breastfeeding mothers. The suckling process causes PRL surges and is responsible for lactation during the postpartum period. In both females and males, PRL affects gonadal function via hypothalamic-pituitary control of gonadotropin secretion.

Prolactin circulates in a variety of forms. In normal sera, monomeric PRL with a molecular weight of 23 kDa accounts for 85-95% of the prolactin present. A second 50 kDa species makes up <10% of the PRL total. Big-big PRL or macroprolactin is a prolactin-IgG complex with a molecular weight of 150 kDa. Macroprolactin accounts for a small but variable amount of total circulating levels. It is cleared more slowly than the monomeric form so it tends to accumulate in the sera. Because of its high molecular mass, the autoimmune complex is confined to the vasculature and has limited biological activity *in vivo*. The monomeric form is the biologically active form.

The common immunoassays used to measure PRL are able to quantitate the hormone in sera. These are generally divided into low, intermediate or high values. These tests however, are unable to distinguish the different forms of the hormone. Special tests

using polyethylene glycol and gel chromatography have been designed to aid this process. Knowing the predominant form of PRL hormone in the patient sera has important consequences for both the clinician and patient. For those patients with hyperprolactinemia due to the presence of macroprolactin, other diagnoses to explain their symptoms must be sought. Patients with true hyperprolactinemia due to an elevated level of the monomeric form may require further imaging tests as well as appropriate treatment. Clinical laboratories continue to look for ways to address the time and labor costs of these tests without compromising the accuracy of their results

Oversecretion of prolactin can result in galactorrhea (nipple discharge), amenorrhea, and infertility in females. In males, excess PRL leads to decreased testosterone production and spermatogenesis resulting in decreased libido, impotence, and infertility. These symptoms are relatively non-specific and can be due to a number of disorders. Therefore, the diagnosis of hyperprolactinemia is dependent on the measurement of circulating prolactin in the appropriate clinical setting.

References:

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