

Estimation of hCG

**Dep. Medical laboratories techniques,
University of Al Maarif**

Lab -5- Clinical endocrinology

Msc. Sumaya Nadhim

Human chorionic gonadotropin is a hormone produced primarily by syncytiotrophoblastic cells of the placenta during pregnancy

The hormone stimulates the corpus luteum to produce progesterone to maintain the pregnancy. Smaller amounts of hCG are also produced in the pituitary gland, the liver, and the colon

As previously mentioned, certain malignancies can also produce either hCG or hCG-related hormone

The hormone itself is a glycoprotein composed of two subunits, the alpha and beta subunits. There are multiple forms found in the serum and urine during pregnancy including the intact hormone and each of the free subunits. HCG is primarily catabolized by the liver, although about 20% is excreted in the urine. The beta subunit is degraded in the kidney to make a core fragment which .is measured by urine hCG tests

Specimen Requirements

Urine Testing

- Urine should not be collected after the patient has been drinking a large amount of fluid, as a dilute specimen may result in a falsely negative test.
- Blood in the urine may cause a false positive test result.

Serum Testing

.Peripheral blood can be obtained for a serum hCG test

Diagnostic Tests

Serum tests for hCG are immunometric assays. This means that they use two antibodies that bind to the hCG molecule, a fixed antibody and a radiolabeled antibody which adhere to different sites on the molecule, sandwiching and immobilize the molecule to make it detectable

Urine assays are similar, although many detect total hCG levels greater than 20 mIU/mL. Many over-the-counter urine pregnancy tests do not detect hyperglycosylated hCG, which accounts for most of the hCG in early pregnancy, resulting in a wide range of sensitivities of these tests

Serum testing is much more sensitive and specific than urine testing. Urine testing, however, is more convenient, affordable, comfortable for patients, has a fast turnaround (5 to 10 minutes), .and does not require a medical prescription

Urine Testing

Urine is placed in or on a designated receptacle (most-
.commercially available and medical point of care tests)

An indicator (typically a colored line or symbol), along with a-
.control, will appear if the test is positive

An isolated control line/symbol will be evident if the test is-
.negative

Serum Testing

Serum hCG testing is performed in a laboratory equipped with the proper machinery and uses a peripheral blood sample

If a hook effect/gestational trophoblastic disease is suspected, the .lab should perform a dilution prior to testing

Interfering Factors

Serum False Positives

Ectopic production of hCG-

Heterophile antibodies-

Rheumatoid factors-

IgA deficiency-

Chronic renal failure-

Red blood cell or plasma transfusion of blood with hCG in it have-
been reported

Exogenous hCG preparations for weight loss, assisted-
.reproduction, doping

Serum False Negatives

Early measurement after conception-

Hook effect" can occur when hCG levels are about 500,000" -
.mIU/mL

Urine False Positives

Blood or protein in the urine-

Human error in result interpretation-

Ectopic production of hCG-

Exogenous hCG-

Drugs (aspirin, carbamazepine, methadone, high urinary pH and-
seminal fluid)

Urine False Negatives

Early measurement after conception-

Dilute urine specimen-

"Hook effect"-



Estradiol : It's also called an E2 test. Estradiol is a form of the hormone estrogen. It's also called 17 beta-estradiol. The ovaries, breasts, and adrenal glands make estradiol. During pregnancy, the .placenta also makes estradiol

Among women, it is primarily synthesized from testosterone in the ovarian follicles, whereas among men, it is produced by the testes .and extraglandular conversion of androgens

Estradiol helps with the growth and development of female sex

:organs, including the

uterus-

fallopian tubes-

vagina-

breasts-

Estradiol helps to control the way fat is distributed in the female

.body. It's also essential for bone and joint health in females

Males also have estradiol in their bodies. Their levels of estradiol are lower than the levels in females

?Why do I need an estradiol test

if female or male sex characteristics aren't developing at the-normal rate

if there are problems with adrenal glands-

It can also help determine if treatment for [hypopituitarism](#), or-

.decreased function of the pituitary gland, is working

.abnormal menstrual period-

.abnormal vaginal bleeding-

.infertility in women-

The estradiol test can also indicate how well the ovaries are working. Therefore, the doctor may also order this test if you have symptoms of an ovarian tumor. The symptoms include

- bloating or swelling in your abdomen -
- trouble eating due to feeling full after eating a small amount of food
- pain in your lower abdominal and pelvic area -
- weight loss -
- frequent urination -

?What are the risks associated with an estradiol test

The risks associated with having an estradiol test are low. They

:include

multiple punctures due to trouble finding a vein-

excessive bleeding-

feeling lightheaded-

fainting-

hematoma, which is an accumulation of blood under your skin-

infection at the needle puncture site-

:Medications that can affect your estradiol levels include

birth control pills -

estrogen therapy -

glucocorticoids -

phenothiazines, which are used to treat schizophrenia and other -
mental disorders

the antibiotics tetracycline (Panmycin) and ampicillin -

:Conditions that can affect estradiol levels include

anemia-

high blood pressure-

kidney disease-

reduced liver function-

?What do estradiol test results mean

Normal levels of estradiol (E2) for menstruating women range-
from 15 to 350 picograms per milliliter (pg/mL)

For postmenopausal women, normal levels should be lower than-
.10 pg/mL

:Estradiol levels that are higher than normal may suggest

early puberty-

tumors in the ovaries or testes-

gynecomastia, which is the development of breasts in men-

hyperthyroidism, which is caused by an overactive thyroid gland-

cirrhosis, which is scarring of the liver-

:Lower than normal levels of estradiol may suggest

menopause-

Turner syndrome-

ovarian failure-

polycystic ovarian syndrome (PCOS)-

depleted estrogen production-

hypopituitarism-

hypogonadism-

**Thank you for
listening**