

Name of the test

Renin

What is this test used for?

This test is used to measure the level of renin in the blood.

Renin is an enzyme, which is produced in juxtaglomerular cells in the kidneys. It is a part of renin-angiotensin-aldosterone system and plays an important role in controlling the blood pressure, as well as maintaining normal levels of potassium and sodium concentration.

Renin is released in response to decreased blood pressure and low sodium concentration in renal tubules. Elevated level of renin increases blood pressure.

Renin converts angiotensinogen to angiotensin-I. The latter is eventually transformed into angiotensin-II, which constricts blood vessels, increases water and sodium retention, stimulates production of aldosterone, antidiuretic hormone and adrenocorticotrophic hormone (ACTH). These hormones further increase sodium retention and potassium elimination with urine. Aldosterone plays an important role in maintaining normal balance between potassium and sodium, regulating blood volume and pressure. Throughout the day, renin is the highest in the morning. Many factors can affect its level, including body position (standing, sitting, lying down) and stress.

When is the test ordered?

The test may be ordered to assess functioning of renin-angiotensin-aldosterone system. It is performed in order to:

- diagnose some of the types of hypertension, detect the cause of hypertension;
- differential diagnosis of hyperaldosteronism
- differential diagnosis of hypokalemia
- monitor glucocorticosteroid therapy
- detect renin-producing tumors
- find out the reason of ineffectiveness of antihypertensive therapy

Renin test is often performed together with aldosterone test.

How is this test performed?

A blood sample is taken from a vein.

How to prepare for the test

It is recommended to take the blood sample early in the morning. Renin is elevated in the second phase of menstrual cycle, so if possible, the blood sample should be taken in the first phase of the cycle.

Many factors can affect renin test results: type of food consumed the previous days, the amount of salt in the food, time of the day and body position when taking the blood sample. The patient may be asked to lie down or stand for some time (ex. 30 minutes or an hour) prior to collecting the blood sample.

Some medications (antihypertensive drugs, diuretics, beta-adrenoblockers, etc.) may affect test results, so it is important to consult the doctor and find out how to prepare for the test.

Interpretation of results

Test results should be interpreted by a doctor.

Result of the renin test alone is not enough for diagnosis. It is vital to consider other test results and clinical symptoms as well.

High level of renin may be due to Addison disease, cirrhosis, renovascular hypertension, renin-producing tumors, secondary aldosteronism. Renin is also elevated during pregnancy.

Decreased level of renin may be due to primary aldosteronism (Conn syndrome), Cushing syndrome.

It is very important to also measure aldosterone levels. For example, Conn syndrome is characterized by elevated aldosterone and decreased renin; on the other hand, both renin and aldosterone are decreased during Cushing syndrome.