Renin concentration

Paediatrics

Monitoring treatment for Congenital Adrenal Hyperplasia (CAH)

Pseudonyms: Direct renin

General information

Collection container: EDTA plasma (3.4 mL Sarstedt pink top).

Type and volume of sample: 1.0 mL whole blood is required as a minimum volume. If aldosterone is requested then two tubes are required.

Specimen transport/special precautions: The tube should be thoroughly mixed before transport to the lab. Separate and freeze plasma immediately. Samples must NOT be refrigerated (2-8°C) due to the risk of cryo-activation. External labs: send frozen plasma on dry ice.

Laboratory information

Method principle: Renin concentration is analysed on an automated instrument using a chemiluminescent immunoassay.

Biological reference ranges:

Age	Renin concentration (mU/L)
<1 week	<312
1 week - 1 year	31.2-109.2
1-2 years	32.4-93.6
2-10 years	22.8-62.4
10-18 years	12.0-31.2

Turnaround time: 3 weeks

Clinical information

The renin-angiotensin-aldosterone system is involved in the regulation of blood pressure. Renin is a proteolytic enzyme converting angiotensinogen to angiotensin I, a polypeptide with little biological activity. In vivo, angiotensin converting enzyme (ACE) acts on angiotensin I to produce the biologically active peptide angiotensin II. The main biological actions of angiotensin II consist of vasoconstriction and the synthesis of aldosterone, a steroid hormone which regulates electrolyte reabsorption by the distal tubule in the kidney.

This assay is mainly used in the monitoring of treatment for Congenital Adrenal Hyperplasia (CAH). The most common form of CAH is 21-hydroxylase deficiency. The Endocrinology Society guidelines for treatment of CAH due to this deficiency recommend treatment with glucocorticoids and the mineralocorticoid fludrocortisone as well as sodium chloride supplements. Inadequate treatment with fludrocortisone can result in a salt wasting crisis, hyperkalaemia and dehydration, whereas excessive treatment can cause hypertension. Therefore the Society recommends frequent monitoring of renin activity.

This assay is only available for paediatric patients. For adults please see Renin (activity).

Factors known to significantly affect the results:

- Patient posture: upright values are higher than supine.
- Anti-hypertensive drugs: variable effects, depending on the drug
- Storage of samples at 2-8°C causes cryo-activation of pro-renin to active renin which can lead to spuriously elevated renin concentrations.
- Grossly haemolysed samples are unsuitable for analysis
- Lipaemic samples are unsuitable for analysis.

(Last updated February 2016)