

Vitamin D

Vitamin D is the generic name for a group of closely related steroids. Vitamin D is a hormone rather than a vitamin.

The majority of Vitamin D is produced by the action of uv light on 7 dehydrocholesterol in the skin to produce Vitamin D₃ - cholecalciferol. A minor proportion comes from food as Vitamin D₂ - ergocalciferol.

Vitamin D itself is biologically inert. It is metabolised to 25-OH Vitamin D in the liver and thence to the active form 1,25-OH Vitamin D by 1 α hydroxylase in the kidneys. In the circulation most of the Vitamin D is bound to Vitamin D binding protein and a smaller amount to albumin.

Vitamin D plays a major role in calcium homeostasis. It increases calcium absorption from the gut, promotes bone mineralisation by provision of calcium, reduces 1 α hydroxylase activity in the kidneys and reduces PTH production by the parathyroid glands.

It has other functions that are not as well understood. These include regulation of cellular differentiation and immunomodulation.

Measurement of 25-OH-Vitamin D₃ assesses the principal storage form of the vitamin.

Causes of low Vitamin D

Reduced production - lack of sunlight
Reduced intake - lack of intake in diet
Reduced absorption - biliary disease
Catabolism - anticonvulsant therapy
Reduced metabolism - chronic renal failure

Inherited diseases -

1) X linked hypophosphataemic rickets

PO₄ leak with impaired 1 α hydroxylase response to the low PO₄.

2) Pseudo Vitamin D deficient rickets

Deficiency of 1 α hydroxylase

3) Hereditary Vitamin D resistant rickets

Autosomal recessive disorder. End organ resistance to 1,25 OH Vitamin D.

Causes of high Vitamin D

Increased ingestion - diet / iatrogenic
Increased production - granulomatous disease / lymphoma

Reference ranges

Vitamin D range is seasonal, however for adequacy should be at least 50nmol/l at all times.

Overt deficiency <25 nmol/L

Moderate deficiency 25-50 nmol/L

(Note that 50-75 nmol/L may be suboptimal)

Upper limit of normal typically 120 nmol/L, although higher values may be acceptable.

> 200 nmol/L may be consistent with possible toxicity

EIA assay measures 25OH D

Specimen type

Serum or lithium heparin or EDTA plasma
Minimum volume 50 uL for EIA

Storage

Fridge or freeze for long term storage

Transport

First class post, ambient temperature

Address for specimens

Department of Clinical Biochemistry
Rotherham Hospital
Moorgate Road
Rotherham, S60 2UD

Cost (excluding VAT)

£10.99 (Combined with Vit A+E = £29.00)

Turnaround

Assay carried out on a daily basis

External QA

DEQAS / Instand e.V.

Contact person

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