

Vitamin B6

Vitamin B6 is a water soluble vitamin which comprises pyridoxine, pyridoxal and their 5-phosphate esters.

Vitamin B6 is widely distributed in food and is dephosphorylated by alkaline phosphatase in the gut for absorption. Following absorption ATP-dependent phosphorylation restores phosphate ester forms. Vitamin B2 dependent oxidases oxidise pyridoxine 5-phosphate and pyridoxamine 5-phosphate to pyridoxal 5-phosphate (PLP) which is the active coenzyme form of Vitamin B6.

Measurement of PLP and its precursor (pyridoxal) are used to assess vitamin B6 status.

Deficiency

Vitamin B6 is important for many metabolic reactions, particularly serotonin and tryptophan formation. Vitamin B6 is an essential cofactor for aminotransferase enzymes.

Deficiency may occur in the diet, due to drugs such as isoniazid and penicillamine, and as an inborn error.

Deficiency of Vitamin B6 leads to increased homocysteine levels. Iron absorption is also compromised.

Symptoms of deficiency are

Skin changes (scaling, hyperpigmentation)
Inflammation of tongue
Depression
Irritability

Toxicity

Use of mega dose Vitamin B6 (up to 6000mg/day compared with a reference nutrient intake several order of magnitude lower) has been described eg

Cystathionase deficiency
Type 1 primary hyperoxaluria
(AGT enzyme needs Vitamin B6 as cofactor)
Idiopathic carpal tunnel
PMT
Schizophrenia
Autism

Vit B6 toxicity results in peripheral neuropathy and encephalopathy.

Elevated Vitamin B6 may be seen with hypophosphatasia (low alkaline phosphatase). Clinical manifestations include defective skeletal mineralisation resulting in osteomalacia / rickets, and dental problems.

Reference ranges

Adult = 40-100 nmol/L (as whole blood PLP)

<20 nmol/L whole blood PLP associated with high risk of deficiency

The assay can also be performed as plasma PLP (ref range 15-70 nmol/L) but this is subject to the acute phase response.

Specimen type

EDTA or lithium heparin WHOLE BLOOD
Protect from light
Minimum volume 50 uL

Storage

Freeze asap after collection

Transport

First class post, ambient temperature

Address for specimens

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

Cost (excluding VAT)

£19.99 (Plasma assay = £35.00)

Turnaround

HPLC assay, every 2 weeks

External QA

Instand e.V.

Contact person

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