

Vitamin E

Vitamin E is a fat soluble vitamin of which α tocopherol has the highest biological activity. It is found in vegetables, seed oils and nuts. It is absorbed in the small intestine with about half passing to the liver and half passing into the lymph. Within the blood it is transported bound to LDL and HDL. Vitamin E accumulates in the liver, muscle and adipose tissue.

Vitamin E is an important chain-breaking antioxidant in cell membranes. It also acts to modulate signal transduction pathways.

Deficiency

Deficiency is rare but may occur in

- Premature and newborn babies
- Conditions associated with fat malabsorption
- Patients on parenteral nutrition
- Abetalipoproteinaemia
- Homozygous hypobetalipoproteinaemia
- Familial isolated Vitamin E deficiency

This may result in *peripheral neuropathy* and *spinocerebellar syndrome*. Note that newborn babies have low serum Vitamin E concentration compared with adults, but may not have true Vitamin E deficiency ie with symptoms.

Toxicity

Relative to other fat-soluble vitamins, Vitamin E is safe. Few side effects have been reported even on very high doses.

Reference ranges

0 - <1yr: 5-50 $\mu\text{mol/L}$

Source: *CALIPER Clin Biochem (2014) 47(9):812-815*

1-6 yrs: 7-21 $\mu\text{mol/L}$

7-12 yrs: 10-21 $\mu\text{mol/L}$

13-18 yrs: 13-24 $\mu\text{mol/L}$

Source: *Clin Chem 1988 34(8) 1625-1628*

Adult: 11.6 – 35.5 $\mu\text{mol/L}$

Source: *Local laboratory data performed as part of FIMLS dissertation 1989*

Vitamin E is bound to lipoproteins and the results of Vitamin E analysis are reported as a molar ratio with serum lipids if elevated (and if enough sample supplied)

Ratio = Vitamin E ($\mu\text{mol/L}$) / (cholesterol + triglyceride) (mmol/L)

The ratio is a good indicator of tissue stores

Paediatric Vitamin E/Lipid ratio

No molar ratio available for < 1 year

1-6 yrs 3-5

7-12 yrs 2-5

13-19 yrs 2-4

Source: *Clin Chem 1988 34(8) 1625-1628*

Adult Vitamin E/Lipid ratio

3.9-5.9

Source: Local Study data

Specimen type

Serum (also lithium heparin - **NOT EDTA plasma**)

Protect from light.

Minimum volume 200 μL – done on dilution (ideally > 250 μL to include lipid analysis)

NOT haemolysed (haemolysed samples can falsely lower results)

Storage

Separate serum or plasma asap and freeze

Transport

First class post, ambient temperature.

Protect from light

Address for specimens

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

Cost

Contact - neil.cuthbert@nhs.net

Turnaround

Weekly HPLC assay

Accreditation

Accredited to UKAS ISO15189

External QA

UKNEQAS/Instand e.V.

Contact persons

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(May 2024 V9)



The Rotherham
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