SydPath
ST VINCENT'S PATHOLOGY

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VITAMIN D INFORMATION SHEET

PHYSIOLOGY

Vitamin D is a steroid hormone with an important role in calcium homeostasis and bone formation. The main storage form of vitamin D is 25-hydroxy vitamin D and measurement of this form provides the best assessment of the vitamin D status in the vast majority of patients. There are a small number of clinical settings where measurement of 1,25-dihydroxyvitamin D is the preferred option. In severe vitamin D deficiency rickets may develop. As well as the effects on bone and calcium, vitamin D has been shown to be important for other clinical outcomes such as muscle strength, reduction in falls, reduced risk for diabetes, cardiovascular disease and autoimmune diseases. Vitamin D can be produced in the skin by exposure to sunlight, obtained as part of a healthy diet or given as oral or parenteral supplements.

INDICATIONS FOR TESTING

There is uncertainty about the appropriate indications for vitamin D testing at this time. However, testing should be considered in patients at risk of reduced sunlight exposure or risk of fracture or with increased demands. Reduced sunlight exposure can occur due to living at extremes of latitude, living primarily indoors (eg some aged-care facility residents), pigmented skin and clothing which covers most of the skin. Elderly patients are at increased risk due to reduced formation of vitamin D in the skin. Patients with osteoporosis, or who are pregnant or breast feeding should also be considered for testing.

INTERPRETATION

There is a lack of international consensus concerning the ideal levels of vitamin D, however an Australian Position Statement on Vitamin D provides useful guidance.

>50 nmol/L - Vitamin D sufficiency
25 - 50 nmol/L - mild vitamin D deficiency
13 - 25 nmol/L - moderate vitamin D deficiency
<13 nmol/L - severe vitamin D deficiency

SydPath Reference interval: 50 - 150 nmol/L.

There is a marked seasonal variation in vitamin D concentrations with Local data showing that 25 hydroxy vitamin D is generally about 15 nmol/L lower in winter than in summer. Thus a concentration above 65 nmol/L in summer is likely to indicate a concentration above 50 nnmol/L year round. Based on data from our laboratory, approximately 20% of outpatients have a 25 hydroxy vitamin D concentration in the mild deficiency range; about 4% in the moderate deficiency range and less than 1% in the severe deficiency range.

Note that toxicity is very rare for serum vitamin D below 250 nmol/L and not generally seen below 500 nmol/L.

MEASUREMENT

Serum 25-hydroxy vitamin D is measured at SydPath by the Diasorin radioimmunoassay (RIA) with solvent extraction. This is a manual process requiring a full day for processing and thus results may not be available for 2 - 3 days after collection as most samples do not commence analysis until the day after collection and occasionally the demand exceeds the assay capacity. The RIA assay however provides a very high analytical quality for the vitamin D measurements.

1,25 dihydroxy vitamin D is referred to an external laboratory. There are few clinical indications for this testing and one of the following must be indicted on the request form for this testing to be performed: renal failure; hypercalcaemia from a granulomatous or autoimmune disorder; osteomalacia; pseudovitamin D deficiency; or hereditary 1,25diOH Vitamin D resistant rickets.

REFERENCES

- Position Statement Vitamin D and adult bone health in Australia and New Zealand: a position statement. MJA 2005; 182 (6):281-285.
- Holick MF. Vitamin D deficiency. NEJM 2007;357:266-81.