

Seasonal Variation in Vitamin D an Adult CF Clinic population

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Abstract

Achieving vitamin D sufficiency in adults with cystic fibrosis (CF) can be a challenge due to multiple factors. In the UK, production of vitamin D from sunlight is limited to between April and October. We instigated a change in practice assessing the vitamin D status of patients during the winter months and compared the vitamin D status of the clinic and supplementation to a previous year. June 2008-May 2009, 210 levels were measured on 178 adult CF patients, 16 with pancreatic sufficiency (ps). Mean serum vitamin D level (25-hydroxyvitamin D) = 61.8nmol/L, median monthly levels were highest in September at 80.5nmol/L and lowest in February at 34.9nmol/L. 46%(97/210) levels were measured between April – October. Patients achieving levels ; > 75nmol/L = 33%(70/210), 50 – 75 nmol/L = 31%(65/210), 30 – 50 nmol/L = 20% (43/210), 15-30nmol/L =11% (23/210) and < 15nmol/L =4% (9/210). Median oral vitamin D supplementation was 900iu of vitamin D June 2011-May 2012, 445 levels were measured on 276 patients, 20 with ps. Mean serum vitamin D level 59.9 nmol/L, median monthly levels were highest in September at 69.4 nmol/L and lowest in December at 50.4 nmol/L. 31% (138/445) levels measured between April – October. Patients achieving levels; > 75nmol/L = 27%(120/445) 50- 75 nmol/L = 33% (145/445), 30 – 50 nmol/L = 24% (110/445), 15-30nmol/L =11%(48/445), < 15nmol/L =5% (22/445). Median oral vitamin D supplementation was 1300iu. Assessing vitamin D status during November-March identified 7% more suboptimal levels in our clinic. This change in practice has improved the vitamin D status of our clinic population in the winter months and increased our level of vitamin D supplementation

Introduction

All pancreatic insufficient patients with Cystic Fibrosis (CF) require vitamin D supplements to prevent deficiency and it is recommended that people with CF achieve serum vitamin D (25-hydroxycholecalciferol) levels of 50 - 75 nmol/L^{1,3}. Low bone mineral density and osteoporosis are complications of CF that have emerged with increasing survival. Whilst the aetiology of these conditions is multifactorial, vitamin D deficiency is an associated risk factor.²

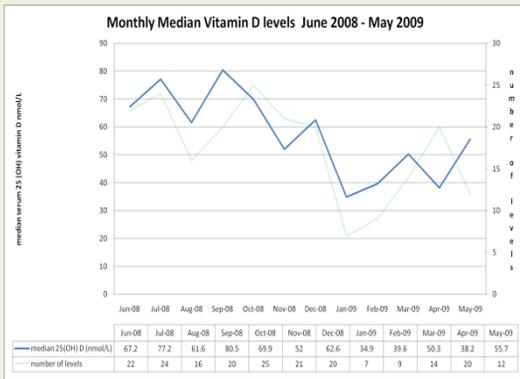
Even with routine supplementation, achieving vitamin D sufficiency in people with CF is a challenge. Seasonal variation occurs in countries of low latitude such as the UK. It is only possible to produce vitamin D from the action of UV light on the skin between the months of April to October. It is recommended that vitamin D status is assessed at the end of winter when status is likely to be lowest, as this may ensure supplementation therapy is adequate all year.³

At the West Midlands Adult CF Centre it had been our usual practice to assess vitamin D levels primarily at annual review. This resulted in patients having their vitamin D status assessed at a similar time of year, annually. Following a review of the vitamin D status of our clinic in 2008-2009, we highlighted that patients who had a vitamin D level in the sufficient range were more likely to have had their vitamin D status assessed during the summer months each year. Following this we instigated a change in practice; assessing the vitamin D status of patients in our clinic during the winter months and comparing the vitamin D status of the clinic and level of supplementation between June 2011 – May 2012 and June 2008 – May 2009

Method

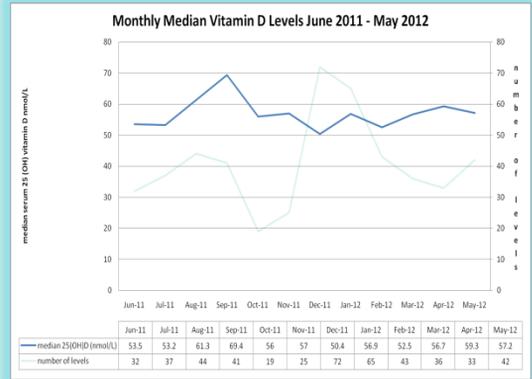
All serum vitamin D levels assayed from patients with cystic fibrosis who attended the West Midlands Adult CF Centre, were retrospectively obtained from the clinical chemistry electronic records between June 2008 - May 2009 and June 2011 – June 2012. Usual doses of vitamin D taken by patients were retrospectively obtained from medical records and pharmacy records.

Results



June 2008 – May 2009

210 serum vitamin D (25 hydroxyvitamin D) levels were measured on 178 subjects, 16 pancreatic sufficient.
Mean serum vitamin D level = 61.8nmol/L (2 – 47 nmol/L)



June 2011 – May 2012

445 serum vitamin D levels were measured on 276 patients, 20 pancreatic sufficient.
Mean serum vitamin D level 59.9 nmol/L (5.6 – 246.6nmol/L)

Vitamin D level	> 75nmol/L	50- 75 nmol/L	30 – 50 nmol/L	15-30nmol/L	<15nmol/L	% during summer months
June 2008 – May 2009	33%(70/210)	31% (65/210)	20% (43/210)	11nmol/L =4% (23/210)	4% (9/210)	46 % (97/210)
June 2011 – May 2012	27%(120/445)	33% (145/445)	24% (110/445)	11%(48/445)	5% (22/445)	31% (138/445)

Conclusions

- Assessing serum vitamin D concentrations during November and March identified 7% more suboptimal levels.
- Our change in practice has reduced seasonal variation and increased the vitamin status of our clinic population during the winter months
- Increased median vitamin D dose has led to this improvement