



## Vitamin D deficiency among patients attending a central New Zealand rheumatology outpatient clinic

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### Abstract

**Aims** To measure the Vitamin D status in patients attending a rheumatology outpatient clinic because of the known musculoskeletal and immunosuppressive effects of Vitamin D deficiency.

**Methods** 66 consecutive patients at a private rheumatology clinic in central New Zealand were recruited at the beginning of winter.

**Results** Of 66 patients, 55 patients were included in the analysis. 43 (78%) had 25OH cholecalciferol levels that were below the reference range (50–150 nmol/L), and of these 12 (22%) had levels classified as moderate to severe deficiency (<25 nmol/L).

**Conclusions** Vitamin D deficiency is common in this setting, and is likely to contribute to the musculoskeletal symptoms experienced in this population.

Most of our vitamin D comes from the photolytic action of sunlight in the UVB spectrum on skin;<sup>1</sup> and in the absence of sunlight, non-fortified dietary sources are normally incapable of providing the daily minimal requirements to maintain levels above that required to maintain bone health (>50 nmol/L) without the consumption of large amounts of oily fish.<sup>2</sup> Furthermore, there is now evidence to suggest that low vitamin D levels are associated with an increased incidence of autoimmune disease such as rheumatoid arthritis<sup>3</sup> and type I diabetes mellitus,<sup>4</sup> as well as an increased incidence of malignancy.<sup>2</sup>

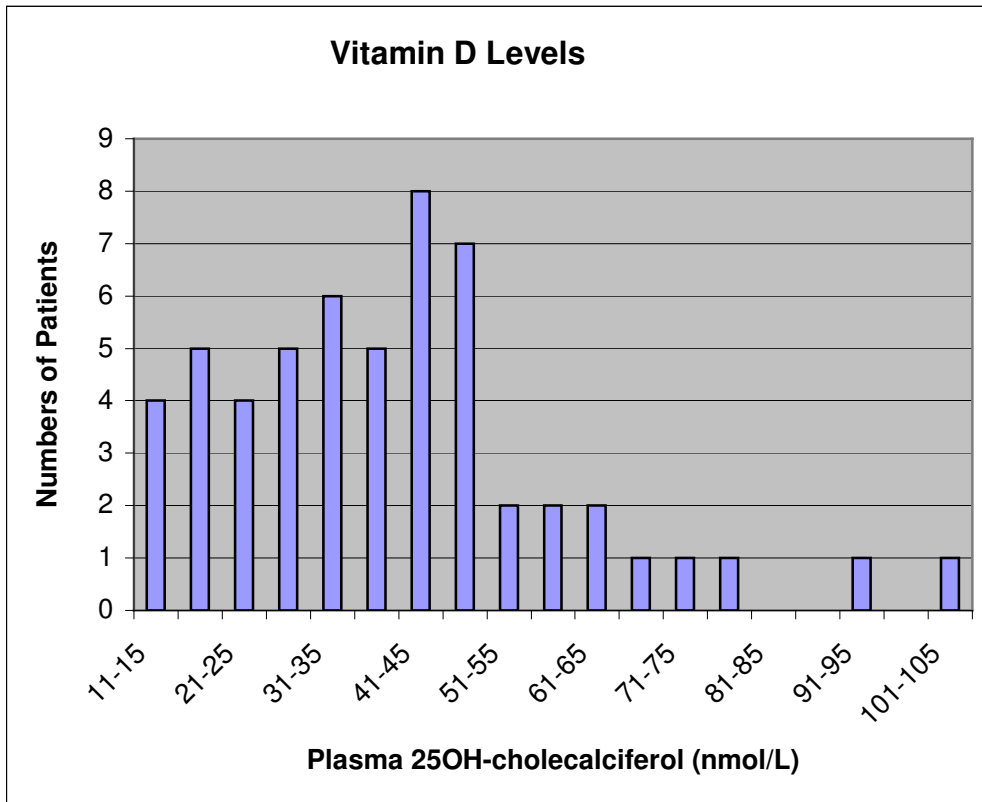
### Methods

All ambulant patients capable of self-care, and attending a private rheumatology clinic in Wellington and Wanganui, were advised that there was a possibility that vitamin D deficiency could be contributing to their musculoskeletal complaints. Pathology forms for vitamin D assay were given to consenting patients from the end of May 2005 to the beginning of July 2005, and the assay was performed either by Capital Coast Health Laboratory, or Southern Community Laboratories. The reference range for both of these laboratories is given as 50–150 nmol/L, and both use the Diasorin assay kit which has a coefficient of variation between tests of 6% which approximates to +/- 12% for 95% confidence limits.

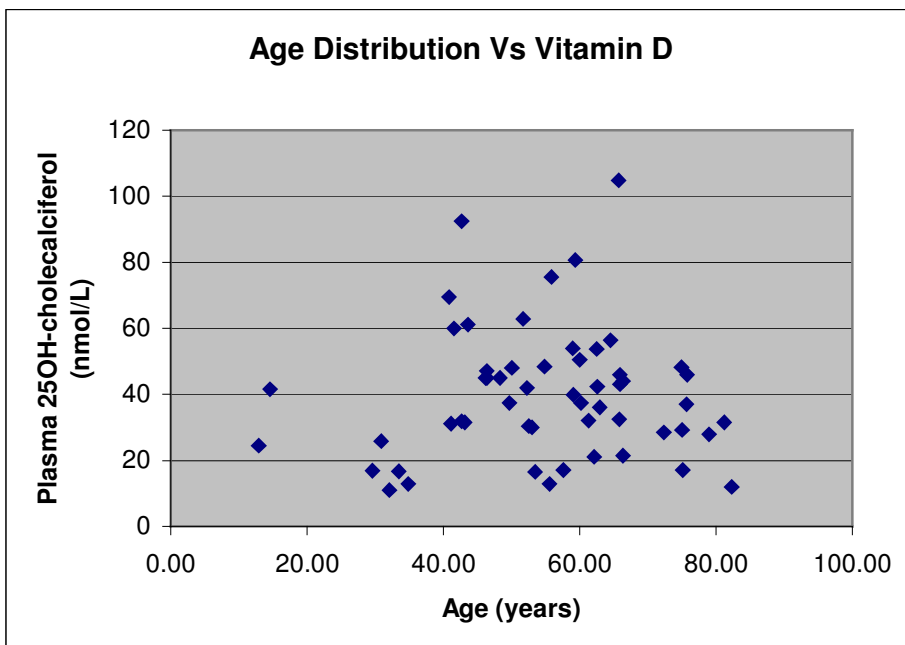
### Results

Of the 66 patients recruited for this audit, 56 had a vitamin D assay performed. One patient who was taking calcitriol was excluded from the analysis. Serum 25OH cholecalciferol results are shown in Figure 1 and age distribution versus 25OH-cholecalciferol levels are shown in Figure 2.

**Figure 1. Serum 25OH cholecalciferol results of patients attending rheumatology clinics at Wellington and Wanganui**



**Figure 2. Age distribution versus 25OH-cholecalciferol levels in patients attending rheumatology clinics at Wellington and Wanganui**



The patients with the highest levels of vitamin D (>60 nmol/L) were found in the age range 40–70 years, and severe deficiency was present throughout the patient population. There were four Asian Indian patients, and they were all found in the lowest quartile; two of these had presented with bone and/or muscle pain. Three Chinese patients were in the third quartile, and the remaining patients were Caucasian.

The bulk of the patients were being treated for inflammatory or autoimmune disease, and the disease distribution is shown in Table 1.

**Table 1. Diseases/conditions in patients attending rheumatology clinics at Wellington and Wanganui**

Disease/condition	Number of patients
Rheumatoid arthritis	17
Inflammatory arthritis	7
Psoriatic arthritis	7
Polymyalgia rheumatica	5
Backpain and muscle pain	3
Arthralgia	2
Osteoarthritis	2
CREST syndrome	1
Enthesopathy	1
Exercise induced urticaria	1
Juvenile RA	1
Oligoarthritis	1
Post viral fatigue	1
Reactive arthritis	1
Sarcoidosis	1
SLE	1
Spondyloarthropathy	1
Tendinitis	1
Undifferentiated CTD	1

RA=Rheumatoid arthritis; CREST=C–calcinosis, R–raynauds, E–esophageal dysfunction, S–sclerodactyly, and T–telangectasias; SLE=Systemic lupus erythematosus; CTD=Connective tissue disease.

## Discussion

Increased vitamin D deficiency has been previously reported in several at-risk settings including inpatients,<sup>5</sup> rest homes for the elderly,<sup>6</sup> and dark-skinned women attending antenatal clinics.<sup>7</sup> This study also shows that ambulant patients attending a rheumatology clinic also have low levels; 22% of them had levels (<25 nmol/L) that can give rise to bone pain and muscle weakness,<sup>9</sup> thus complicating their existing diseases.

Nine (17%) patients had vitamin D levels lower than 17.5 nmol/L which is higher than the figure of 3% reported by Skeaff<sup>9</sup> for New Zealand adolescents and adults. It is not known whether this higher result is a reflection of Wellington’s latitude of 41.3 degrees south, or whether it is a function of the population being studied.<sup>15,16</sup>

Importantly, vitamin D is now known to have important immune functions, and low intake has been linked to rheumatoid arthritis,<sup>3</sup> multiple sclerosis,<sup>10</sup> and type I

diabetes.<sup>4</sup> Several small prospective studies have shown that vitamin D analogues have disease-suppressing effects in rheumatoid arthritis<sup>11</sup> and so maintaining high non-toxic levels of vitamin D may have positive therapeutic implications for patients with inflammatory disease.

Although a reference range for bone health is given as 50–150 nmol/L by both laboratories, a minimum level of 110 nmol/L has been reported to suppress rises in parathyroid hormone in healthy elderly men and women<sup>14</sup> and therefore may be a more appropriate treatment target.

It is suggested that patients attending rheumatology clinics have their vitamin D status assessed and their deficiency states corrected. Furthermore, they should be given advice on sunlight exposure relevant to their skin type and latitude of residence. Current sunlight exposure recommendations for New Zealand<sup>12</sup> are based upon ultraviolet data, and need confirmation with biological studies as it is possible that (based on Northern Hemisphere studies) there is likely to be very little cutaneous vitamin D synthesis occurring during the winter months.<sup>13</sup> In that case, supplementation may have to be recommended for all patients during the winter period.

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