Acquiring adequate vitamin D during the Covid-19 pandemic: evidence for a protective role?

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Vitamin D functions

Vitamin D is vital for bone health

- Bone growth, bone and muscle function

Deficiency ➔ Rickets in children

➔ osteomalacia (soft bones) at all ages

Other potential benefits of vitamin D

- Immune system function
- Protection against certain cancers
- Anti-inflammatory
Vitamin D acquisition

Food – only small amounts:

- Oily fish (salmon, sardines, mackerel)
- Dairy: milk, egg yolks, cheese
- Fortified foods: cereals

MAIN SOURCE: SUNLIGHT EXPOSURE

- 90% of vitamin D requirement
UK national guidance on vitamin D

Pre-2016
• Aged 4-64y: Dietary intake not necessary
• RNI 10 µg (400 IU)/day for those “at risk”:
  • ≥ 65 years; limited sunlight exposure; minority ethnic groups

2016: Scientific Advisory Committee on Nutrition Report
• RNI 10 µg (400 IU)/day for everyone aged 4 and over
• 97.5% of population to maintain 25OHD ≥25 nmol/L year-round

Actual Public Health England / NHS advice
• Aged ≥5: consider 10 µg/day supplement in autumn/winter
• Limited sunlight, minority ethnic groups: 10 µg/day year-round
Vitamin D guidance during Covid-19

Coronavirus update

Consider taking 10 micrograms of vitamin D a day to keep your bones and muscles healthy.

This is because you may not be getting enough vitamin D from sunlight if you’re indoors most of the day.

Dr Alison Tedstone, Chief Nutritionist, PHE, said:

“With many people spending more time indoors, particularly the more vulnerable groups and those ‘shielding’, there is a risk that some people may not be getting all the vitamin D they need from sunlight. It’s important they consider taking a daily 10 micrograms vitamin D supplement to help protect bone and muscle health.”
Monthly vitamin D status: White Caucasian adults aged 20 – 60 yrs
Could vitamin D protect against Covid-19?

Proposed evidence - mechanistic

- Induction of antimicrobial peptides
- Reduction of pro-inflammatory cytokine production
- Induction of regulatory T-cells which inhibit inflammation

Proposed evidence - epidemiological

- Outbreak in winter when vitamin D levels are lowest
- Fewer cases in Southern Hemisphere (summer-end)
- More infections and greater severity in older people and ethnic minorities
Vitamin D status in different age groups
Vitamin D status in different age groups

The chart shows the distribution of 25OHD (nmol/L) levels in different age groups (12-15y, 20-60y, ≥ 65y) for January and September. The levels are categorized as "Sufficient" above 50 nmol/L and "Deficient" below 25 nmol/L.
Vitamin D status in different ethnicities
Vitamin D status in different ethnicities
Could vitamin D protect against Covid-19?

Coronavirus update

Consider taking 10 micrograms of vitamin D a day to keep your bones and muscles healthy.

This is because you may not be getting enough vitamin D from sunlight if you’re indoors most of the day.

There have been some news reports about vitamin D reducing the risk of coronavirus. However, there is currently not enough evidence to support this.

Do not buy more vitamin D than you need.
Associations between vitamin D and Covid-19

Low serum 25-hydroxyvitamin D (25[OH]D) levels in patients hospitalised with COVID-19 are associated with greater disease severity


Factors Associated with Hospitalization and Disease Severity in a Racially and Ethnically Diverse Population of COVID-19 Patients

Angelico Mendy, Senu Apewokin, Anjanette A Wells, Ardythe L Morrow
Vitamin D and respiratory tract infections

- No effect of vitamin D supplementation on incidence or duration
- None of the study population were vitamin D deficient
Vitamin D and respiratory tract infections

- 10,933 patients from 25 randomised controlled trials
- Vitamin D reduced risk of RTI in all participants
- Effect stronger in those with vitamin D deficiency
Could vitamin D protect against Covid-19?

1st July 2020

SACN Rapid Review
“..evidence currently does not support vitamin D supplementation to prevent ARTIs in the general UK population.”

NICE Rapid Evidence Summary
“..currently no evidence to support taking vitamin D supplements to reduce the risk or severity of Covid-19.”
Conclusions

- Conflicting evidence on protective role of vitamin D in RTIs

- Largest meta-analysis indicates a protective effect, especially in those deficient

- Too few data to evaluate impact on Covid-19

- Vital to maintain adequate vitamin D for bone and muscle health
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