TOOLS FOR PRACTICE #394 | July 21, 2025

TOOLS FOR PRACTICE

PEER PATIENTS EXPERIENCE EVIDENCE RESEARCH

Vitamin D and Respiratory Tract Infections: Does the sun's vitamin chase the cold?

CLINICAL QUESTION

Does Vitamin D supplementation prevent acute respiratory tract infections?

BOTTOM LINE

Vitamin D supplementation does not decrease the risk of developing respiratory tract infections, regardless of vitamin D level or age. This is supported by several large randomized controlled trials (RCTs).

EVIDENCE

- Results statistically significant unless indicated.
- Four systematic reviews of RCTs, past 5 years.[1-4] Most comprehensive (various doses, follow-up 7 weeks-5 years):[4]
- Proportion of participants with ≥1 respiratory infection: [4]
    - 49% (vitamin D) versus 50% (placebo): not statistically different (40 RCTs, 61,589 participants). [4]
    - Largest five RCTs (>1000 events each): No difference.[4]
    - No effect regardless of baseline vitamin D levels, examples:[4]
        - Baseline vitamin D <25nmol/L: 73.3% (vitamin D) versus 73.6% (placebo): Not statistically different.
        - Baseline vitamin D >75nmol/L: 25% both groups.

- Sub-group analyses sometimes show positive effects.
    - Limitations: Risk of spurious results due to multiple comparisons, publication bias (results skewed by small positive trials), improbable results (example: Vitamin D doses 400-1000IU would have benefits but doses 1000-2000IU would not),[4] inconsistency within and across systematic reviews (example: subgroup ages 1-15 shows possible benefit but meta-regression analysis does not;[4] other review shows no benefit for age group 1-18).[1]
- Adverse events: [4]
    - Serious: 6.9% versus 7.3%: no difference.
    - Renal stones: 2% both groups.
- Other systematic reviews similar.[1-3]

CONTEXT

- Subgroup analyses suggest patients with low vitamin D levels get more respiratory infections; however since supplementation does not improve outcomes, this suggests low vitamin D level is likely a surrogate marker for poor health.[4]
- Cows milk in Canada is fortified with Vitamin D.[5]
- Guideline (based on low certainty evidence) indicates that supplementation may prevent respiratory infections in children, [6] but accompanying systematic review did not find a significant difference (12 RCTs, 12,951 children aged 1-18).[1]

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