TITLE: Formulation of Vitamin D for Preventative Supplementation: Clinical Evidence and Guidelines

DATE: 20 September 2012

RESEARCH QUESTIONS

1. What is the clinical evidence comparing the different formulations of vitamin D for preventative supplementation?

2. What are the evidence-based guidelines regarding the optimal formulation of vitamin D for preventative supplementation?

KEY MESSAGE

Two systematic reviews and meta-analyses, two randomized controlled trials, and two non-randomized studies were identified regarding the clinical evidence comparing different formulations of vitamin D for preventative supplementation. No evidence-based guidelines were identified regarding the optimal formulation of vitamin D for preventative supplementation.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2012, Issue 8), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. Methodological filters were applied to limit retrieval to health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, and guidelines. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2007 and September 7, 2012. Internet links were provided, where available.
The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines. Two systematic reviews and meta-analyses, two randomized controlled trials, and two non-randomized studies were identified regarding the clinical evidence comparing different formulations of vitamin D for preventative supplementation. No health technology assessments were identified on the above topic. No evidence-based guidelines were identified regarding the optimal formulation of vitamin D for preventative supplementation. Additional references of potential interest are provided in the appendix.

OVERALL SUMMARY OF FINDINGS

Vitamin D2 versus Vitamin D3

One systematic review and meta-analysis\(^1\) demonstrated that vitamin D3 was more effective at elevating serum 25-hydroxyvitamin D [25(OH)D] concentrations than was vitamin D2, hence the authors concluded that vitamin D3 would be the preferential choice for vitamin D supplementation.

Bioavailability of Vitamin D through different vehicle substances

One systematic review\(^2\) assessed the impact of vehicle substances on Vitamin D bioavailability and demonstrated that an oil vehicle produced a greater 25(OH)D response than a powder or an ethanol vehicle.

One randomized controlled trial\(^4\) examined the bioavailability of vitamin D to adults through daily supplements of 10 micrograms (µg) cholecalciferol in the form of a fish oil capsule compared to 10 µg of cholecalciferol given as a multivitamin tablet. The authors concluded that the fish oil capsules and multivitamin tablets were capable of raising serum 25(OH)D to similar levels.

Route of administration of Vitamin D

One randomized controlled trial\(^3\) assessed the administration of a bolus dose of 50,000 international units (IU) of vitamin D, as a routine vaccination every two months to infants compared to a daily dose of 200 IU or 400 IU. This study showed that the bolus dose raised serum 25(OH)D to an ideal level without any serious side effects.

One non-randomized study\(^5\) treated Vitamin D deficient African Americans with 50,000 units of ergocalciferol monthly or over-the-counter calcium supplements with vitamin D. Among the deficient individuals, 79% were no longer vitamin D deficient post oral supplementation.

One non-randomized study\(^6\) assessed the treatment of females over the age of 65 with an intramuscular injection of 300,000 IU of vitamin D3 (cholecalciferol) compared to no treatment.
The study showed that the intramuscular vitamin D injection significantly improved serum 25(OH)D levels compared to no treatment.

Evidence-based guidelines

No evidence-based guidelines were identified regarding the optimal formulation of vitamin D for preventative supplementation, hence no summary is provided on this topic.
REFERENCES SUMMARIZED

Health Technology Assessments
No literature identified.

Systematic Reviews and Meta-analyses


Randomized Controlled Trials


Non-Randomized Studies


Guidelines and Recommendations
No literature identified.

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APPENDIX – FURTHER INFORMATION:

Randomized Controlled Trials - **Compliance**


Randomized Controlled Trials - **Vitamin D Fortified Foods**


Non-Randomized Studies - **Vitamin D Fortified Milk**


Clinical Practice Guidelines