SEPTEMBER 25TH, 2022
VOL 2., NO. 3
ISSN 2833-0153

EYE RESEARCH CENTER

FALL 2022 E-NEWSLETTER

INSIDE THIS ISSUE

Research News

Author

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Title

Multiple sclerosis and Parkinson's disease: The role of vitamin D

Summary

Vitamin D is a lipid soluble vitamin that is known as immunomodulatory hormone. Vitamin D is responsible for calcium and phosphate metabolism regulation and maintaining a healthy mineralized skeleton (1,2). Neurological disorders such as multiple sclerosis (MS) and Parkinson's disease (PD) have been associated with malnutrition and serum 25-hydroxyvitamin D deficiency (3). Low vitamin D levels are linked to a higher risk of MS (4). If MS patients are not exposed to the sun on a daily basis during the winter, they are advised to take vitamin D supplements to achieve serum 25(OH)D levels of at least 20 ng/ml (5). Limited exposure to sunlight and vitamin D deficiency were found to be strongly linked with an elevated risk of PD. Vitamin D levels were shown to be lower in PD patients. These findings highlight early detection necessity of bone loss and vitamin D inadequacy, especially in the early stages of PD (6). Vitamin D supplementation, on the other hand, had no effect in improving motor function in PD patients (7). Vitamin D's optimal levels (>30 ng/ml) require vitamin A to bind to its receptors and exert its anti-inflammatory action (8). On the other hand, chronic and high-dose vitamin D therapy can cause life-threatening complications, such as renal failure, cardiac arrhythmia, and status epilepticus. Vitamin D toxicity symptoms might include tiredness, muscular weakness, or urinary dysfunction, mimicking MS. To mitigate vitamin D toxicity risk, vitamin D supplementation must be under professional supervision. It is clear that vitamin D deficiency contributes to MS and PD, however we need to identify the risk-benefit profile of dosage and dosage duration when supplementing with vitamin D.

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Research News

Author
Aaron McNulty, OD., FAAO
Title
Does myopia stop for red lights?
Summary
Recent studies have reported surprising results from red light therapy. What is this therapy, who could benefit, and how does it work?
A multi center randomized controlled trial (Jiang et. al 2022) followed 264 Chinese children age 8 to 13. Starting refractive error ranged from -1.00 to -5.00. The study involved 12 months of follow up. Subjects were given desktop light therapy of 650 nm wavelength at 1600 Lux. Therapy was given five days per week, twice daily for three minute sessions. The authors tracked refractive error, axial length, and OCT scans to monitor for structural side effects.
The results were fairly striking. After 12 months of follow up, therapy slowed axial elongation by 69% compared to the control group. Myopic progression slowed by 77%. And in 22% of participants, axial length actually decreased!
The mechanism of action remains unclear. The authors hypothesize that it may be related to scleral oxygenation. Recent evidence suggests that scleral hypoxia may promote scleral remodeling and myopia development. Red light treatment may increase blood flow and metabolism of the fundus, thus decreasing scleral hypoxia. Many questions remain. The authors call for further research with double masking and placebo control. They call for a greater understanding regarding long-term efficacy and safety, rebound effects, optimal treatment strategies, and potential underlying mechanisms.
Dong et. al (2022) shed further light on red light. In a randomized, double blind, controlled clinical trial, the authors compared red light therapy to a sham device. Therapy was delivered for three minutes per session twice daily. Cycloplegic refraction and axial length were measured at baseline and six months. The authors report decreased myopia progression and axial elongation in the treatment group versus the sham device control group. It is worth noting that both of these studies were based in China and seemed to involve primarily Chinese subjects. The applicability of this therapy to other ethnicities remains to be seen. And as Jiang et. al described, significant questions must be answered before this therapy is ready for prime time. But in the near future it may represent another useful tool in our toolbelt for fighting the myopia epidemic.
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FALL 2022
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ISSN 2833-0153

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EST. 2021
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