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APLICAÇÕES CLÍNICAS DE COENZIMA Q10, VITAMINAS B12,A,D,E,K e MELATONINA

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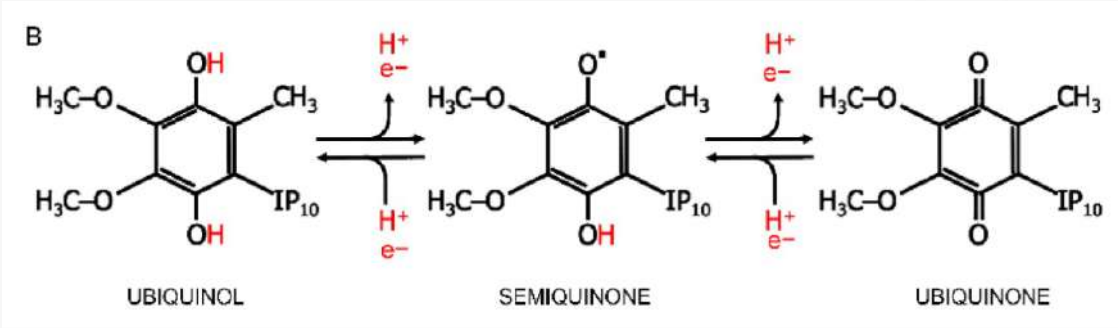
MASTERCLASS
SUPLEMENTAÇÃO EM GOTAS BIOATIVAS

COENZIMA Q10



Nutrients; 14(20):4326, 2022
doi: 10.3390/nu14204326

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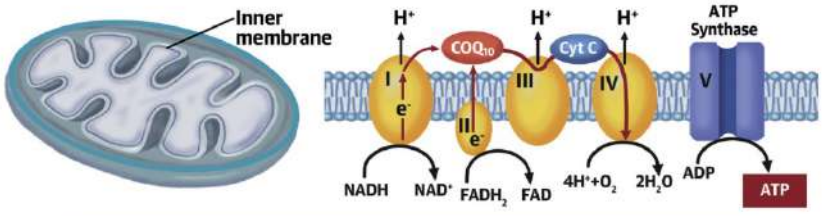
COENZIMA Q10



The Essential Role of CoQ_{10} in Cellular Bioenergetics

- Mediates electron transfer necessary for oxidative phosphorylation and ATP production
- Functions as a potent antioxidant

PRODUÇÃO DE ENERGIA

J Am Coll Cardiol; 77(5):609-619, 2021
doi: 10.1016/j.jacc.2020.12.009

Coenzyme Q10 supplementation and oxidative stress parameters: a systematic review and meta-analysis of clinical trials

Abstract

Purpose Oxidative stress (OS) is associated with several chronic complications and diseases. The use of coenzyme Q10 (CoQ10) as an adjuvant treatment with routine clinical therapy against metabolic diseases has shown to be beneficial. However, the impact of CoQ10 as a preventive agent against OS has not been systematically investigated.

Methods A systematic literature search was performed using the PubMed, SCOPUS, EMBASE, and Cochrane Library databases to identify randomized clinical trials evaluating the efficacy of CoQ10 supplementation on OS parameters. Standard mean differences and 95% confidence intervals were calculated for net changes in OS parameters using a random-effects model.

Results Seventeen randomized clinical trials met the eligibility criteria to be included in the meta-analysis. Overall, CoQ10 supplementation was associated with a statistically significant decrease in malondialdehyde (MDA) (SMD − 0.94; 95% CI − 1.46, − 0.41; I^2 = 87.7%) and a significant increase in total antioxidant capacity (TAC) (SMD 0.67; 95% CI 0.28, 1.07; I^2 = 74.9%) and superoxide dismutase (SOD) activity (SMD 0.40; 95% CI 1.12, 0.67; I^2 = 9.6%). The meta-analysis found no statistically significant impact of CoQ10 supplementation on nitric oxide (NO) (SMD − 1.40; 95% CI − 0.12, 1.93; I^2 = 92.6%), glutathione (GSH) levels (SMD 0.41; 95% CI − 0.09, 0.91; I^2 = 70.0%), catalase (CAT) activity (SMD 0.36; 95% CI − 0.46, 1.18; I^2 = 90.0%), or glutathione peroxidase (GPx) activities (SMD − 1.40; 95% CI: − 0.12, 1.93; I^2 = 92.6%).

Conclusion CoQ10 supplementation, in the tested range of doses, was shown to reduce MDA concentrations, and increase TAC and antioxidant defense system enzymes. However, there were no significant effects of CoQ10 on NO, GSH concentrations, or CAT activity.

AÇÃO ANTIOXIDANTE

Suplementação de CoQ10 reduz as concentrações de malondialdeído, aumenta a capacidade antioxidante total e enzimas de defesa antioxidante, como a SOD.

Eur J Clin Pharmacol; 76(11):1483-1499, 2020
doi: 10.1007/s00228-020-02919-8

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Efficacy and Optimal Dose of Coenzyme Q10 Supplementation on Inflammation-Related Biomarkers: A GRADE-Assessed Systematic Review and Updated Meta-Analysis of Randomized Controlled Trials

Scope: Coenzyme Q10 (CoQ10) has become a popular nutritional supplement due to its wide range of beneficial biological effects. Previous meta-analyses show that the attenuation of CoQ10 on inflammatory biomarkers remains controversial. This meta-analysis aims to assess the efficacy and optimal dose of CoQ10 supplementation on inflammatory indicators in the general population.

Methods and results: Databases are searched up to December 2022 resulting in 6713 articles, of which 31 are retrieved for full-text assessment and included 1517 subjects. Double-blind randomized controlled trials (RCTs) of CoQ10 supplementation are eligible if they contain C reactive protein (CRP), interleukin-6 (IL-6), and tumor necrosis factor-α (TNF-α). CoQ10 supplementation can significantly reduce the levels of circulating CRP (SMD: -0.40, 95% CI: [-0.67 to -0.13], p = 0.003), IL-6 (SMD: -0.67, 95% CI: [-1.01 to -0.33], p < 0.001), and TNF-α (SMD: -1.06, 95% CI: [-1.59 to -0.52], p < 0.001) and increase the concentration of circulating CoQ10.

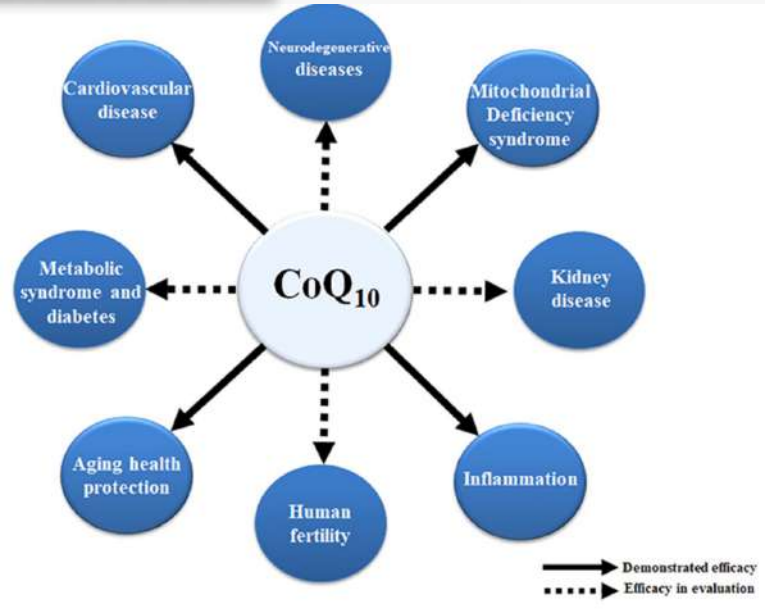
Conclusion: This meta-analysis provides evidence for CoQ10 supplementation to reduce the level of inflammatory mediators in the general population and proposes that daily supplementation of 300-400 mg CoQ10 show superior inhibition of inflammatory factors.

AÇÃO ANTI-INFLAMATÓRIA

Suplementação de CoQ10 reduz os níveis de marcadores inflamatórios na população em geral, reduzindo PCR, IL-6 e TNF-alfa, principalmente em doses mais altas de 300 a 400 mg/dia

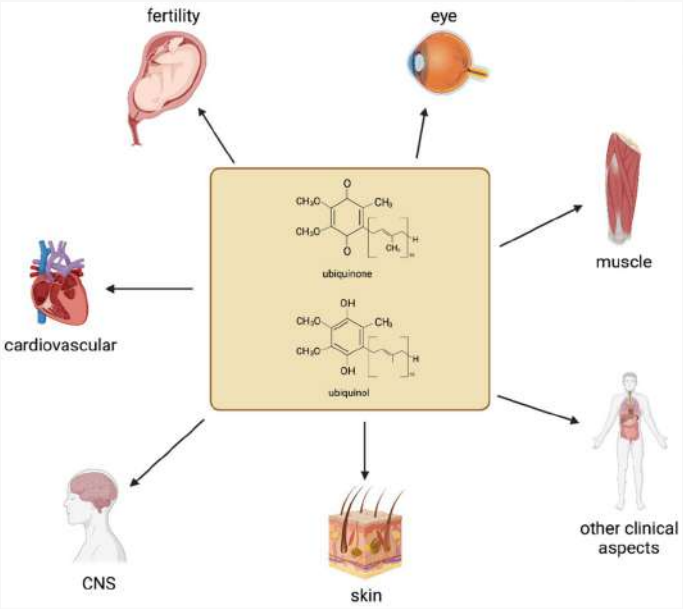
Mol Nutr Food Res; 67(13):e2200800, 2023
doi: 10.1002/mnfr.202200800

APLICAÇÕES CLÍNICAS



Front Physiol; 9: 44, 2018
doi: 10.3389/fphys.2018.00044

APLICAÇÕES CLÍNICAS



Antioxidants (Basel); 10(8):1325, 2021
doi: 10.3390/antiox10081325

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The effects of coenzyme Q10 administration on glucose homeostasis parameters, lipid profiles, biomarkers of inflammation and oxidative stress in patients with metabolic syndrome

Fariba Raygan[1] · Zohreh Rezavandi[1] · Sahar Dadkhah Tehrani[2] · Alireza Farrokhian[1] · Zatollah Asemi[2]

COENZIMA Q10

Duplo-cego, randomizado, placebo-controlado

60 indivíduos com sobrepeso ou obesos e DM2 com DAC
Idades de 40 a 85 anos

G1: 100 mg de CoQ10
G2: placebo

8 semanas

Overall, daily intake of 100 mg CoQ10 supplements among patients with MetS for 8 weeks had beneficial effects on serum insulin levels, HOMA-IR, HOMA-B and plasma TAC concentrations; however, it did not had any effect on the FPG, lipid profiles, inflammatory markers, GSH and MDA.

Efeitos benéficos nos níveis de insulina, HOMA-IR, HOMA-Beta e capacidade antioxidante total

Eur J Nutr; 55(8):2357-2364, 2016
doi: 10.1007/s00394-015-1042-7

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Coenzyme Q_{10} Supplementation Improves Adipokine Levels and Alleviates Inflammation and Lipid Peroxidation in Conditions of Metabolic Syndrome: A Meta-Analysis of Randomized Controlled Trials

COENZIMA Q10

Abstract: Evidence from randomized controlled trials (RCTs) suggests that coenzyme Q_{10} (CoQ_{10}) can regulate adipokine levels to impact inflammation and oxidative stress in conditions of metabolic syndrome. Here, prominent electronic databases such as MEDLINE, Cochrane Library, and EMBASE were searched for eligible RCTs reporting on any correlation between adipokine levels and modulation of inflammation and oxidative stress in individuals with metabolic syndrome taking CoQ_{10}. The risk of bias was assessed using the modified Black and Downs checklist, while the Grading of Recommendations Assessment, Development and Evaluation (GRADE) tool was used to evaluate the quality of evidence. Results from the current meta-analysis, involving 318 participants, showed that CoQ_{10} supplementation in individuals with metabolic syndrome increased adiponectin levels when compared to those on placebo (SMD: 1.44 [95% CI: −0.13, 3.00]; $I^2 = 96\%$, $p < 0.00001$). Moreover, CoQ_{10} supplementation significantly lowered inflammation markers in individuals with metabolic syndrome in comparison to those on placebo (SMD: −0.31 [95% CI: −0.54, −0.08]; $I^2 = 51\%$, $p = 0.07$). Such benefits with CoQ_{10} supplementation were related to its ameliorative effects on lipid peroxidation by reducing malondialdehyde levels, concomitant to improving glucose control and liver function. The overall findings suggest that optimal regulation of adipokine function is crucial for the beneficial effects of CoQ_{10} in improving metabolic health.

Meta-análise demonstrou redução de inflamação, estresse oxidativo e resistência à insulina com a suplementação de CoQ10.

Também promoveu aumento de adiponectina.

Os benefícios da CoQ10 são associados aos seus efeitos na peroxidação lipídica juntamente com melhora do controle glicêmico e da função hepática.

Int J Mol Sci; 21(9):3247, 2020
doi: 10.3390/ijms21093247

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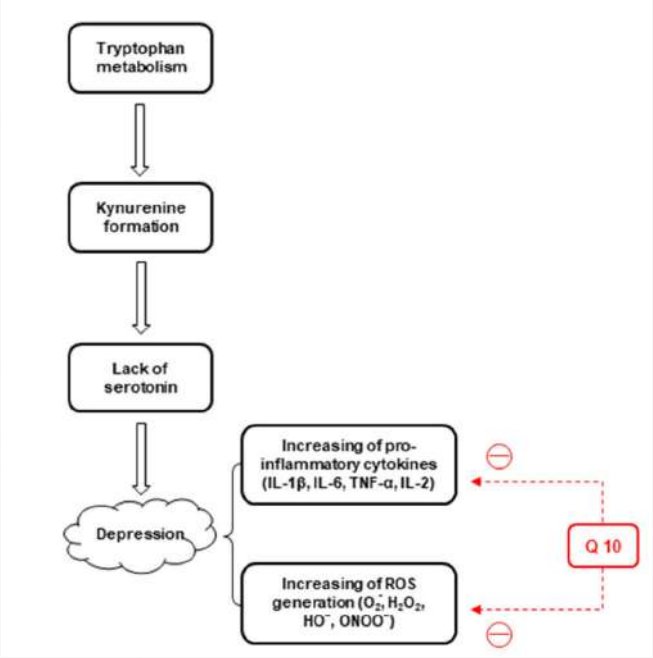

COQ10

Neuroprotective effects of coenzyme Q10 on neurological diseases: a review article

Front Neurosci; 17:1188839, 2023
doi: 10.3389/fnins.2023.1188839

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The effects of coenzyme Q10 supplementation on metabolic profiles and parameters of mental health in women with polycystic ovary syndrome

Objective: Evaluating the impact of coenzyme Q10 (CoQ10) supplementation on hormonal indices, mental health, and biomarkers of inflammatory responses and oxidative stress among female patients suffering from polycystic ovary syndrome (PCOS).

Methods: The present double-blinded, placebo-controlled randomized clinical trial consisted of 55 PCOS women (aged 18-40 years old), who were randomized into groups receiving 100 mg/day of CoQ10 (28 cases) or placebo (27 cases) for 12 weeks.

Results: The supplementation of CoQ10 decreased significantly the scores of Beck Depression Inventory (BDI) ($p = .03$) and Beck Anxiety Inventory (BAI) ($p = .01$) and high-sensitivity C-reactive protein (hs-CRP) level ($p = .005$) when comparing with the placebo group. Moreover, CoQ10 group exhibited a significant drop in total testosterone ($p = .004$), dehydroepiandrosterone sulfate (DHEAS) ($p < .001$), hirsutism ($p = .002$) and malondialdehyde (MDA) ($p = .001$) levels in the serum, and a significant rise in sex hormone-binding globulin (SHBG) ($p < .001$) and total antioxidant capacity (TAC) ($p < .001$) levels in the serum than the placebo group.

Conclusions: 12-week supplementation of CoQ10 to PCOS women showed beneficial impact on BDI, BAI, hs-CRP, total testosterone, DHEAS, hirsutism, SHBG, TAC and MDA levels.

Gynecol Endocrinol; 38(1):45-49, 2022
doi: 10.1080/09513590.2021.1991910

COQ10

Randomizado, duplo-cego, placebo-controlado

Mulheres com SOP

G1: 100 mg/dia de CoQ10
G2: placebo

12 semanas

Houve redução dos sintomas de depressão e ansiedade nessas mulheres, além de melhorar PCR-US, testosterona, hirsutismo, SHBG, capacidade antioxidante total e níveis de malondialdeído.

VITAMINA B12

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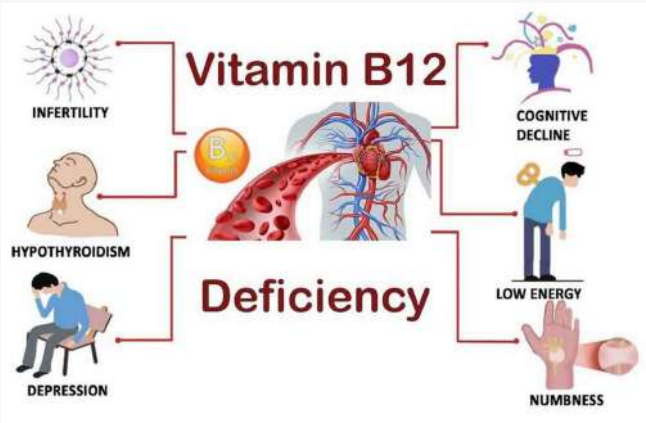
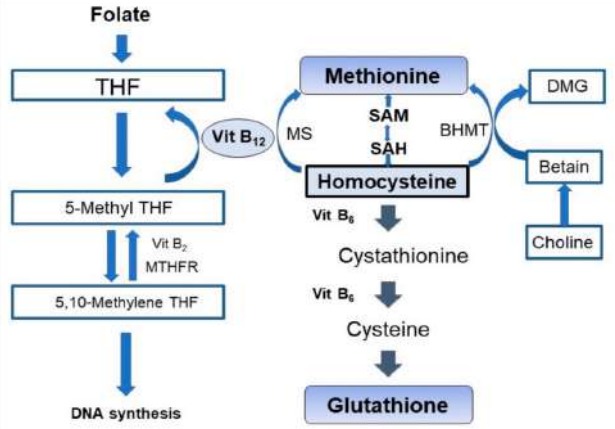
VITAMINA B12



- INFERTILIDADE
- HIPOTIREOIDISMO
- DEPRESSÃO
- DECLÍNIO COGNITIVO
- FALTA DE ENERGIA, FADIGA
- DORMÊNCIA
- SAÚDE CARDIOVASCULAR

Elgar, K. Vitamin B12: a review of clinical use and efficacy. Nutr Med J., 1 (3), 9-25, 2022

VITAMINA B12



Nutrients; 14(7):1494, 2022
doi: 10.3390/nu14071494

Table 1. Diseases and Conditions Associated With Hyperhomocysteinemia

- Alzheimer's disease
- Birth defects
- Blood clots
- Cancer
- Coronary artery disease
- Dementia
- Endothelial damage
- Miscarriage
- Myocardial infarction
- Parkinson's disease
- Pre-eclampsia
- Stroke

Integr Med (Encinitas); 13(4):8-14, 2014

Vitamin B12, folate, and homocysteine in metabolic syndrome: a systematic review and meta-analysis

Background & aims: Metabolic syndrome (MetS) is associated with life-threatening conditions. Several studies have reported an association of vitamin B12, folic acid, or homocysteine (Hcy) levels with MetS. This systematic review and meta-analysis assessed the association of vitamin B12, folic acid, and Hcy levels with MetS.

Methods: PubMed, Scopus, Embase, Ovid/Medline, and Web of Science were searched up to February 13, 2023. Cross-sectional, case-control, or cohort studies were included. A random-effects model was performed using the DerSimonian and Laird method to estimate the between-study variance. Effect measures were expressed as odds ratios (OR) with their corresponding 95% confidence intervals (95% CI). Between-study heterogeneity was evaluated using Cochran's Q test and the I^2 statistic.

Results: Sixty-six articles (n = 87,988 patients) were included. Higher vitamin B12 levels were inversely associated with MetS (OR = 0.87; 95% CI: 0.81–0.93; $p < 0.01$; $I^2 = 90\%$). Higher Hcy levels were associated with MetS (OR = 1.19; 95% CI: 1.14–1.24; $p < 0.01$; $I^2 = 90\%$). Folate levels were not associated with MetS (OR = 0.83; 95% CI: 0.66–1.03; $p = 0.09$; $I^2 = 90\%$).

Conclusion: Higher vitamin B12 levels were inversely associated with MetS, whereas higher Hcy levels were associated with MetS. Studies assessing the pathways underlying this association are required.

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VITAMINA B12

Vitamina B12 foi inversamente correlacionada com síndrome metabólica, enquanto altos níveis de homocisteína tiveram associação positiva.

Front Endocrinol (Lausanne); 14:1221259, 2023
doi: 10.3389/fendo.2023.1221259

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Low Vitamin B12 Levels and Its Association With Insulin Resistance: A Potent Cardiovascular Risk Indicator in Childhood Asthma

Introduction As insulin resistance metabolically affects the body mass index (BMI), obese asthma children have more severe diseases than children with normal body mass index. A low level of vitamin B12 (Vit B12) is a known atherogenic factor by increasing the homocysteine level and therefore promotes cardiovascular morbidity and mortality. Limited studies have evaluated the role of serum B12 and insulin resistance among poorly controlled asthma in children. The purpose of the study was to compare the cardio-metabolic risk factor such as BMI, waist-hip ratio (WHR), insulin resistance, and vitamin B12 in well-controlled and poorly-controlled asthma patients and to determine the relationship between these parameters with the severity of asthma as assessed by Pulmonary Function Test. Methodology Based on the asthma control questionnaire and Global Initiative for Asthma (GINA) criteria, chronic asthma patients (n=60) of age 10-15 years were divided into two groups, namely well-controlled and poorly-controlled (30 each). Anthropometry was assessed by BMI and waist-hip ratio, and fasting blood samples were collected for the estimation of blood glucose, insulin, and serum vitamin B12 levels. Insulin resistance (HOMA-IR) was calculated using the formula- fasting glucose (mg/dL) x fasting insulin (µIU/mL)]/405. Forced expiratory volume (FEV1), forced vital capacity (FVC), and FEV1/FVC ratio were measured to assess the pulmonary function test. Results There were significant differences in the values of the BMI, insulin resistance, vitamin B12, and pulmonary function tests between poorly controlled and well-controlled asthma (p<0.01). The FEV1: FVC% was negatively correlated with BMI (r=0.53), WHR (r=0.50), glucose (r=0.68), insulin (r=0.68), Insulin resistance (r=0.80), and positive correlation with Vit B12 (0.73). In addition, Vit B12 and HOMA-IR correlate negatively (r=0.76). Conclusion This study concludes that the level of Vit B12 is decreased and insulin resistance is increased in poorly controlled asthmatic children in comparison to well-controlled asthma. These factors along with the increased BMI in poorly controlled asthma can predispose to cardiometabolic risk which needs attention.

VITAMINA B12

Vitamina B12 e HOMA-IR foram negativamente correlacionados, ou seja, quanto melhor os níveis de B12, menor é o HOMA-IR

Cureus; 15(5):e39422, 2023
doi: 10.7759/cureus.39422

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Low Levels of Serum Total Vitamin B12 Are Associated with Worse Metabolic Phenotype in a Large Population of Children, Adolescents and Young Adults, from Underweight to Severe Obesity

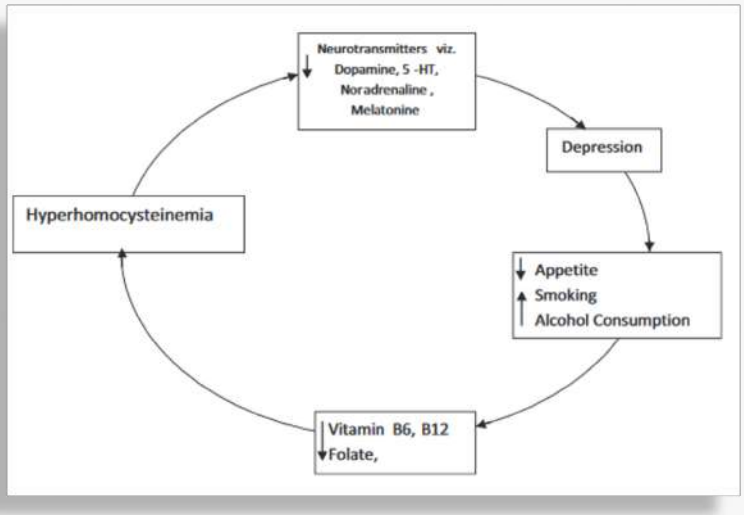
Vitamin B12 (or cobalamin) is an essential vitamin for DNA synthesis, fatty acid and protein metabolism as well as other metabolic pathways fundamental to the integrity of cells and tissues in humans. It is derived from the diet and mostly stored in the liver. Its deficiency has been associated with metabolic derangements, i.e., obesity, glucose intolerance, increased lipogenesis and metabolic dysfunction-associated steatotic liver disease (MASLD) and steatohepatitis (MASH). However, data with regard to body weight across the whole spectrum (from underweight to severe obesity) in children and young individuals are scarce. The present study aims to describe the association between serum total vitamin B12 and body mass index (BMI) ranging from underweight to severe obesity in a large population of children, adolescents and young adults. This study also investigates associations with visceral adiposity, glucose and lipid metabolism and liver dysfunction. A cross-sectional, single-centre study was conducted at the Paediatrics and Endocrinology units of the "Bambino Gesù Children Hospital", a tertiary referral institution for eating disorders. Clinical charts were reviewed and 601 patients aged from 5 to 25 years were enrolled in order to analyse anthropometric, auxological, clinical, biochemical and liver ultrasound data using robust statistical approaches. Analyses were adjusted for potential confounders. A reduction in serum total B12 levels was associated with a linear increase in body weight, as expressed by WHO BMI SDS ($r = -0.31$, $p < 0.001$, BCa 95% -0.38, -0.24). Lower B12 levels were associated with higher waist circumference but only in pubertal girls ($r = -0.33$, $p = 0.008$, BCa 95% -0.53, -0.11). Hepatic insulin resistance was higher in males with lower B12 levels (B = -0.003 (-0.007, -0.0001), $p = 0.039$), but not in females, whereas whole-body insulin resistance was unaffected. Serum lipid profiles (total, HDL and LDL cholesterol and triglycerides) were not influenced by serum cobalamin levels. However, lower cobalamin levels were associated with higher grading of ultrasound-scored hepatic steatosis ($p_{trend} = 0.035$). Lastly, both AST and ALT showed a significant and direct correlation with total B12 levels in underweight ($r = 0.22$ and 0.24, $p = 0.002$ and <0.001, respectively) and severely obese subjects ($r = 0.24$ and 0.32, $p = 0.002$ and <0.001). In conclusion lower vitamin B12 levels are associated with higher body weight, adiposity and with worse metabolic health in a large population of children, adolescents and young adults.

VITAMINA B12

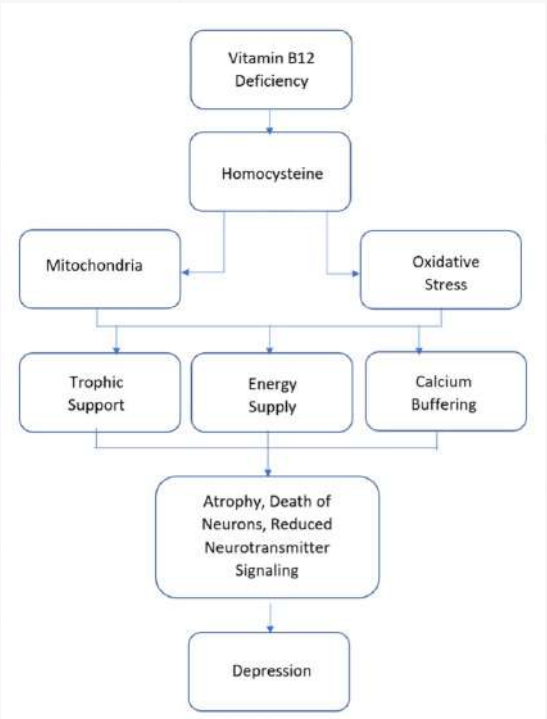
Baixos níveis de B12 foi associado com maior peso, adiposidade e pior saúde metabólica em população de crianças, adolescentes e adultos jovens.

Int J Mol Sci; 24(23):16588, Nov 2023
doi: 10.3390/ijms242316588

HIPERHOMOCISTEINEMIA



Fundam Clin Pharmacol; 29(6):522-8, 2015
doi: 10.1111/fcp.12145



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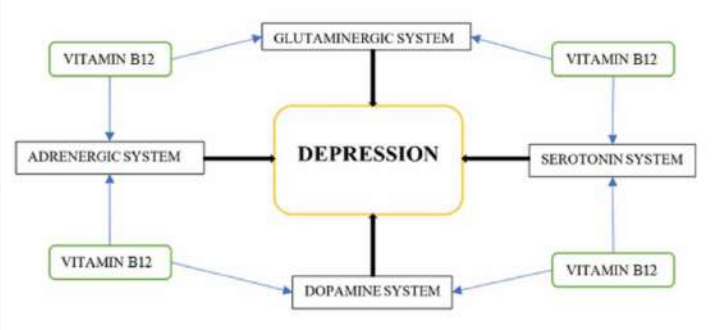
VITAMINA B12

Vitamin B12 Supplementation: Preventing Onset and Improving Prognosis of Depression



Cureus; 12(10):e11169, 2020
doi: 10.7759/cureus.11169

VITAMINA B12

Neuropsychiatric manifestations in vitamin B12 deficiency

Vitamin B12 deficiency can have distressing neuropsychiatric symptoms. It can have an etiological role in clinical presentations like depression, anxiety, psychosis, dementia, and delirium, requiring screening of at-risk populations. Few mechanisms that underlie the neuropsychiatric manifestations of B12 deficiency include alteration in one-carbon metabolism, genetic vulnerability, and alteration in folate metabolism. Maintaining a high serum B12 level in elderly can be protective against Alzheimer's disease (AD). In an established AD, its deficiency is associated with higher cognitive decline and risk for delirium. The other mental changes associated with B12 deficiency include apathy, agitation, impaired concentration, insomnia, persecutory delusions, auditory and visual hallucinations, and disorganized thought-process. Besides serum vitamin B12, plasma methylmalonic acid (MMA) and homocysteine helps in diagnosis. The chapter focuses on early recognition and effective treatment of these neuropsychiatric manifestations of vitamin B12 deficiency.

Vitam Horm; 119:457-470, 2022
doi: 10.1016/bs.vh.2022.01.001

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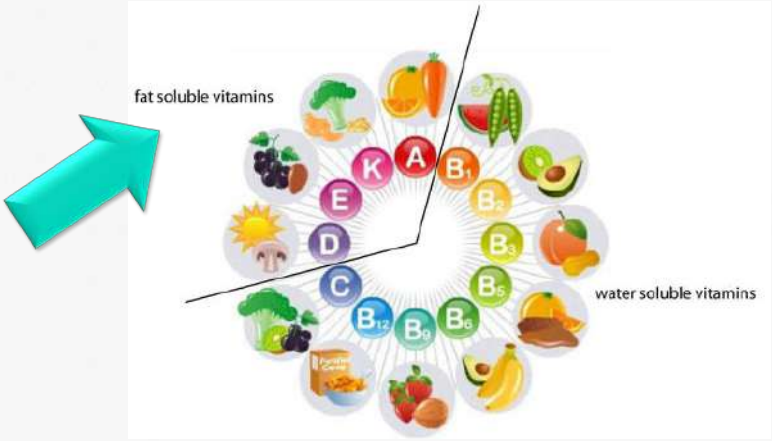
VITAMINAS LIPOSSOLÚVEIS



VITAMINA A

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VITAMINA A

- Atividade antioxidante e anti-inflamatória

- Estimula produção de citocinas anti-inflamatórias
- Estimula produção de anticorpos, principalmente IgA que atua contra infecções virais
- Estimula a atividade de linfócitos T e B
- Induz a expressão gênica de interferon (IFN), o que diminui a replicação viral

- Estudos em Influenza A, sarampo, HIV, Covid-19, entre outros.

Trends Food Sci Technol; 110:66-77, 2021
Nutrients; 12(1):236, 2020
Crit Rev Biochem Mol Biol; 54(2):184-192, 2019
Annu Rev Nutr; 21:167-92, 2001

- SAÚDE OCULAR
- SAÚDE INTESTINAL
- MODULAÇÃO HORMONAL
- SAÚDE ÓSSEA
- ESTÉTICA
- AÇÃO ANTIOXIDANTE
- MODULAÇÃO IMUNOLÓGICA

dentre outras...

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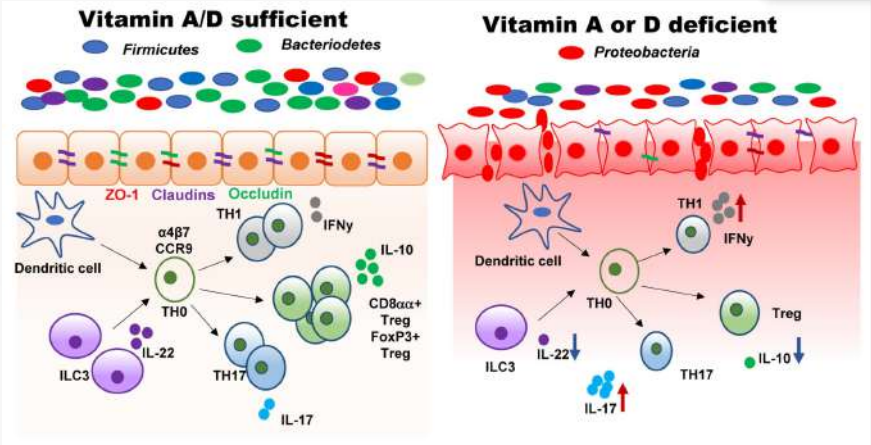
Vitamin A and vitamin D regulate the microbial complexity, barrier function and the mucosal immune responses to insure intestinal homeostasis

VITAMINAS A e D



Deficiências dessas vitaminas altera a composição da microbiota, aumenta permeabilidade.
Quando essas vitaminas estão adequadas, elas contribuem para a barreira intestinal, aumentando a expressão de claudinas e ocludinas, fortalecendo as *tight junctions*, e aumentando peptídeos antimicrobianos

Crit Rev Biochem Mol Biol; 54(2):184-192, 2019
doi: 10.1080/10409238.2019.1611734

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VITAMINA D

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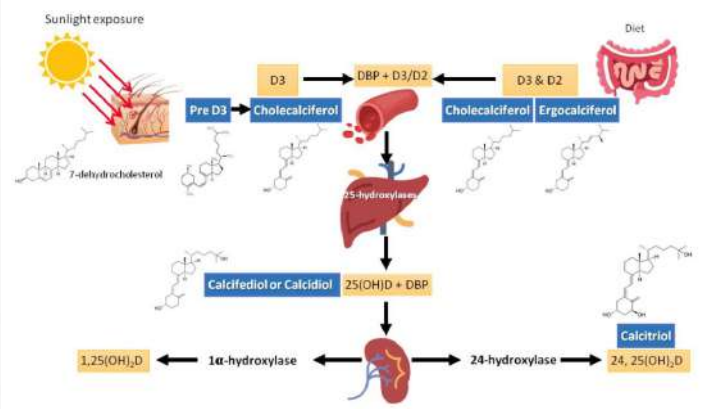
VITAMINA D



Metabolites; 11(4):255, 2021
doi: 10.3390/metabo11040255

- SAÚDE ÓSSEA
- FUNÇÃO MUSCULAR
- MODULAÇÃO HORMONAL
- SECREÇÃO DE INSULINA
- FERTILIDADE
- MODULAÇÃO IMUNOLÓGICA

dentre outras...

Serum and supplemental vitamin D levels and insulin resistance in T2DM populations: a meta-analysis and systematic review

Observational studies have shown a negative correlation between Vitamin D level and the likelihood of developing insulin resistance (IR) and/or diabetes over time, yet evidence remains inconsistent. In this meta-analysis and systematic review, we strive to define the potential association between serum or supplemental Vitamin D Levels and insulin resistance respectively, as well as the contribution of Vitamin D to type 2 diabetes, and to summarize the biologic plausibility of Vitamin D. Four databases (PubMed, Embase, Cochrane Library, and Web of Science) were searched for this Systematic Literature Review (SLR) to find appropriate observational studies and clinical trials published in English through to July 2022. EndNote (version X9) is used to manage the literature search results. We calculated Standard Mean Differences (SMDs) and Risk Ratios (RRs) with their 95% Confidence Intervals (CIs), separately, for continuous and dichotomous outcomes. The correlation coefficients were normalized to z values through Fisher's z-transformation to calculate the relevant statistics. Meta-analyses were carried out for all comparisons, based on a random-effects pooling model. Data analysis was performed using RevMan (version 5.3) and STATA (version 15.1). All statistical tests were two-sided, with $P < 0.05$ were regarded as significant. In our current meta-analysis, there are 18 RCTs and 20 observational studies including 1243 and 11,063 participants respectively. In the overall analysis, the diabetic with Vitamin D supplement treatment group showed significantly improve serum insulin (SMD = −0.265, 95% CI −0.394 to −0.136, $P < 0.05$), glucose (SMD = −0.17, 95% CI −0.301to −0.039, $P < 0.05$) and HOMA-IR (SMD = −0.441, 95% CI −0.582 to −0.3, $P < 0.05$) compared with the routine treatment group. Correlation analysis results showed that all three outcomes were significantly correlated in a negative manner with raised Vitamin D (insulin: r = −0.08 95% = −0.12 to −0.04; glucose: r = −0.06 95% = −0.11 to −0.01; HOMA-IR: r = −0.08 95% = −0.09 to −0.06). Results of overall analysis proved that vitamin D has shown significant effect on regulates insulin resistance, and there is a significant inverse association between serum Vitamin D level and IR. Vitamin D supplementation is expected to be integrated into conventional medical approaches to prevent type 2 diabetes and to mitigate the burden of diabetes for individuals and society.

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VITAMINA D

Meta-análise demonstrou que os níveis de vitamina D são inversamente proporcionais à resistência à insulina e a suplementação de vit D melhora glicemia de jejum, insulina de jejum e HOMA-IR

Scientific Reports; 13(1):12343, 2023
doi: 10.1038/s41598-023-39469-9

Vitamin D and Risk of Incident Type 2 Diabetes in Older Adults: An Updated Systematic Review and Meta-Analysis

Abstract: Vitamin D deficiency is very common worldwide, particularly in old age, when people are at the highest risk of the negative adverse consequences of hypovitaminosis D. Additionally to the recognized functions in the regulation of calcium absorption, bone remodeling, and bone growth, vitamin D plays a key role as a hormone, which is supported by various enzymatic, physiological, metabolic, and pathophysiological processes related to various human organs and systems. Accruing evidence supports that vitamin D plays a key role in pancreatic islet dysfunction and insulin resistance in type 2 diabetes. From an epidemiological viewpoint, numerous studies suggest that the growing incidence of type 2 diabetes in humans may be linked to the global trend of prevalent vitamin D insufficiency. In the past, this association has raised discussions due to the equivocal results, which lately have been more convincing of the true role of vitamin D supplementation in the prevention of incident type 2 diabetes. Most meta-analyses evaluating this role have been conducted in adults or young older persons (50–60 years old), with only one focusing on older populations, even if this is the population at greater risk of both hypovitaminosis D and type 2 diabetes. Therefore, we conducted an update of the previous systematic review and meta-analysis examining whether hypovitaminosis D (low serum 25OHD levels) can predict incident diabetes in prospective longitudinal studies among older adults. We found that low 25OHD was associated with incident diabetes in older adults even after adjusting for several relevant potential confounders, confirming and updating the results of the only previous meta-analysis conducted in 2017.

VITAMINA D

Meta-análise demonstrou que os níveis de vitamina D são inversamente proporcionais à incidência de diabetes em idosos, pois vit D tem um papel importante na disfunção de células beta-pancreáticas e na resistência à insulina em DM2

Nutrients; 16(11):1561, May 2024
doi: 10.3390/nu16111561

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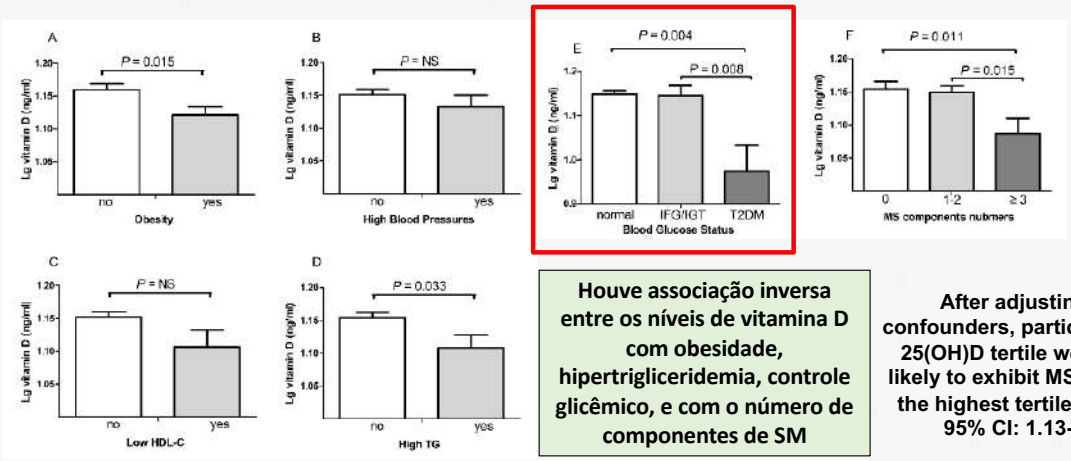
Vitamin D levels are associated with metabolic syndrome in adolescents and young adults: The BCAMS study

Junling Fu [a,1], Lanwen Han [b,1], Yanglu Zhao [c], Ge Li [a], Yingna Zhu [b], Yu Li [a], Ming Li [a,*], Shan Gao [b,**], Steven M. Willi [d]

VITAMINA D



Houve associação inversa entre os níveis de vitamina D com obesidade, hipertrigliceridemia, controle glicêmico, e com o número de componentes de SM

After adjusting for potential confounders, participants in the lowest 25(OH)D tertile were 2.5 times more likely to exhibit MS than were those in the highest tertile (Odds Ratio: 2.48; 95% CI: 1.13-5.45, P < 0.05)

Clin Nutr; 38(5):2161-2167, 2019
doi: 10.1016/j.clnu.2018.08.039

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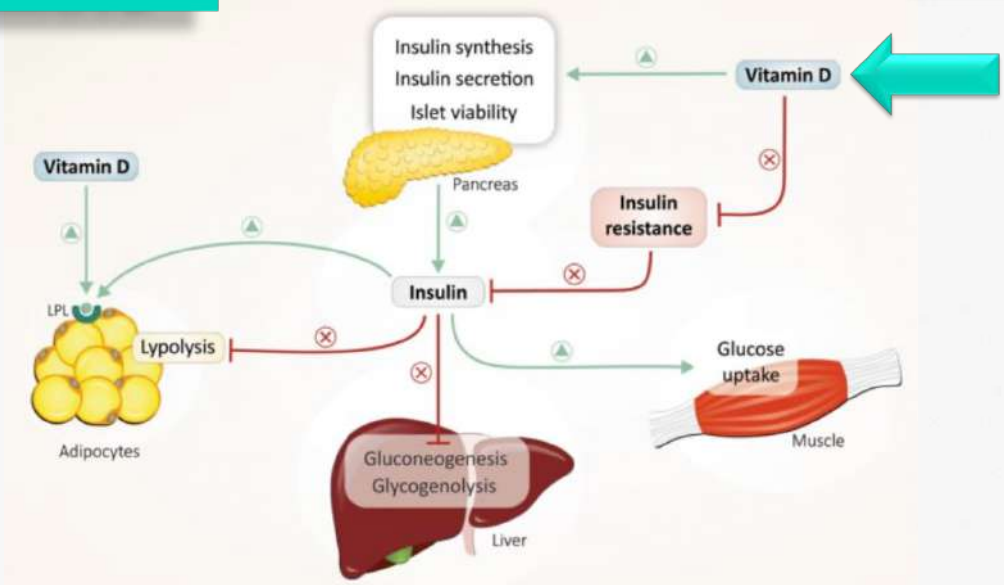
VITAMINA D



Metab Brain Dis; 34(2):527-535, 20
doi: 10.1007/s11011-018-0371-7

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The Association between Vitamin D Deficiency and Sleep Disorders: A Systematic Review and Meta-Analysis

Abstract: Epidemiology studies have investigated the association between vitamin D and the risk of sleep disorders, but the results remain controversial. Therefore, we conducted this meta-analysis with the goal of clarifying the association between vitamin D and sleep disorders risk. All relevant studies were searched using PubMed, EMBASE, and Web of Science from inception to January 2018. Pooled odds ratios (ORs) and 95% confidence interval (CIs) were calculated using a fixed-effect model A total of nine studies (6 cross-sectional, 2 case-control, and 1 cohort studies) involving 9397 participants were included. By comparing the lowest verse highest levels of serum vitamin D, we found that participants with vitamin D deficiency (VDD) had a significantly increased risk of sleep disorders (OR: 1.50, 95% CI: 1.31, 1.72). Subgroup analysis showed that VDD also was associated with poor sleep quality (OR: 1.59, 95% CI: 1.23, 2.05), short sleep duration (OR: 1.74, 95% CI: 1.30, 2.32), and sleepiness (OR: 1.36, 95% CI: 1.12, 1.65). Subgroup analyses further indicated that serum 25(OH)D <20 ng/mL could significantly increase the risk of unhealthy sleep. This meta-analysis suggest that vitamin D deficiency is associated with a higher risk of sleep disorders. More high-quality cohort studies and randomized controlled trials (RCTs) are needed to verify this association.

VITAMINA D

Deficiência de vitamina D aumenta o risco de desordens do sono. Essa deficiência foi associada com qualidade ruim do sono, duração curta do sono e sonolência ao longo do dia.

Nutrients; 10(10):1395, 2018
doi: 10.3390/nu10101395

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Effects of vitamin D supplementation on muscle function and recovery after exercise-induced muscle damage: A systematic review

Abstract

Background: Vitamin D is essential for the optimal health of the skeletal system. However, this vitamin is also involved in other functions of the human body, such as muscle, immune and inflammatory ones. Some studies suggest that adequate levels of vitamin D support muscular function during exercise and accelerate recovery because they reduce specific pro-inflammatory cytokine levels, but those results have not always been observed. Therefore, this review aims to evaluate the effects of vitamin D supplementation on inflammation, oxidative stress and recovery after exercise.

Methods: This systematic review was conducted using the Preferred Reporting of Systematic Reviews and Meta-Analyses (PRISMA) guidelines. A literature search of SPORTDiscuss, PubMed, Web of Science and Scopus was performed from inception through February 2022. The articles' methodological quality was assessed with the PEDro scale.

Results: After the application of the inclusion and exclusion criteria, 11 eligible articles were included. All the studies were considered of moderate methodological quality. Ten studies involved regular vitamin D supplementation for more than 7 days, and one study performed acute vitamin D supplementation 24 h before exercise.

Conclusions: The existing evidence suggests that vitamin D supplementation for periods of more than 1 week with a minimum dose of 2000 IU/day appears to be an efficacious strategy for attenuating muscle damage and inflammation after exercise. The potential positive effects on muscle function, muscle pain and oxidative stress need to be confirmed with new investigations. Further research is also required to determine the adequate vitamin D dosage to obtain positive effects without adverse effects.

VITAMINA D

Key points

- Regular vitamin D supplementation may be a good recovery strategy from strenuous exercise.
- Supplementation is effective with a minimum dose of 2000 IU/day for periods of more than 1 week.
- Athletes may also benefit from ingesting a single dose before exercise, but further research is needed.

J Hum Nutr Diet; 36(3):1068-1078, 2023
doi: 10.1111/jhn.13084

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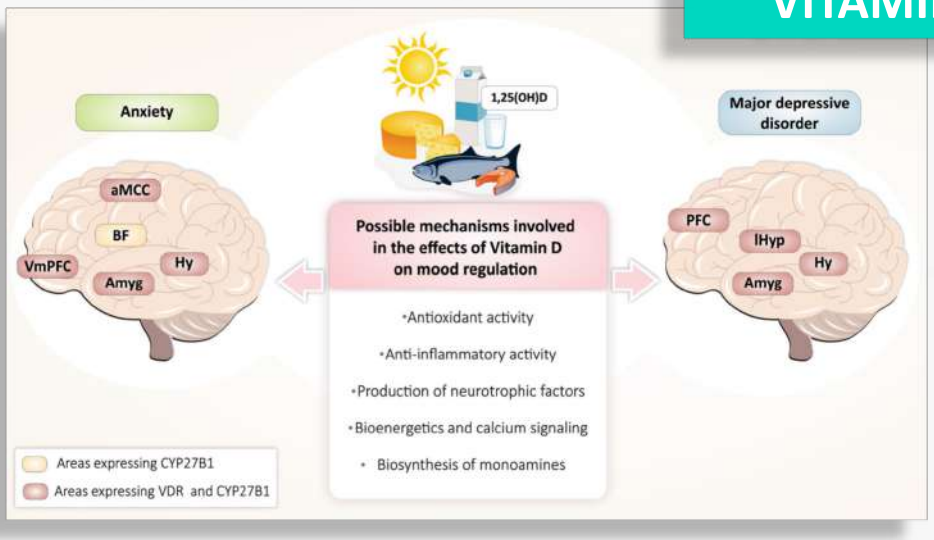
Potential Role of Vitamin D for the Management of Depression and Anxiety

VITAMINA D



CNS Drugs; 33(7):619-637, 2019
doi: 10.1007/s40263-019-00640-4

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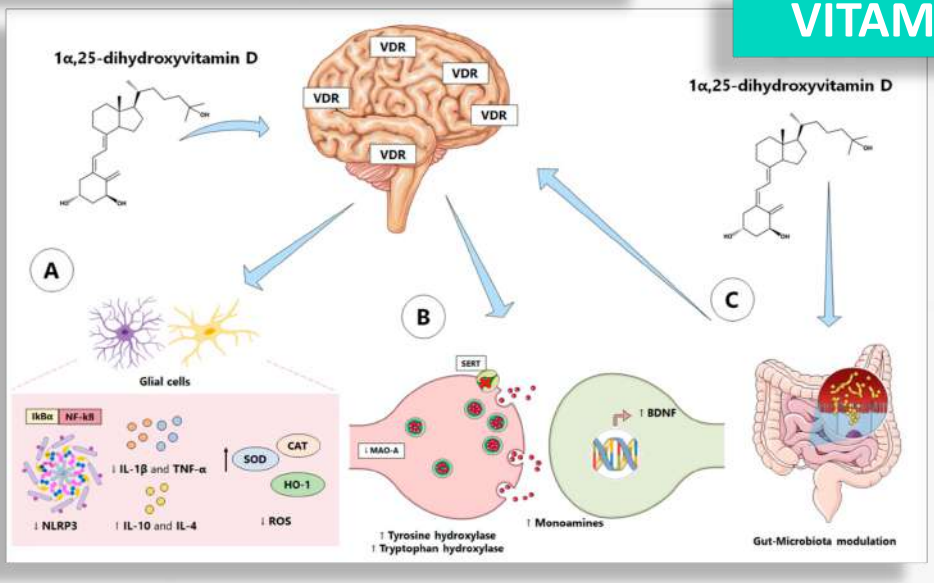
Molecular Basis Underlying the Therapeutic Potential of Vitamin D for the Treatment of Depression and Anxiety

VITAMINA D



Int J Mol Sci; 23(13):7077, 2022
doi: 10.3390/ijms23137077

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VITAMINA D

Vitamin D Supplementation for Depressive Symptoms: A Systematic Review and Meta-analysis of Randomized Controlled Trials

Objective—To review the effects of vitamin D supplementation on depression or depressive symptoms in randomized controlled trials. Although low vitamin D levels have been observationally associated with depression and depressive symptoms, the effect of vitamin D supplementation as an antidepressant remains uncertain.

METHODS—MEDLINE, CINAHL, Allied and Complimentary Medicine Database, PsycINFO, Scopus, and The Cochrane Library, and references of included reports (through May 2013) were searched. Two independent reviewers identified randomized trials that compared the effect of vitamin D supplementation on depression or depressive symptoms to a control condition. Two additional reviewers independently reviewed and extracted relevant data; disagreements were reconciled by consensus. The Cochrane Risk of Bias Tool was used to assess study quality. Seven trials (3191 participants) were included.

RESULTS—Vitamin D supplementation had no overall effect on depressive symptoms (standardized mean difference [SMD], −0.14; 95% CI, −0.33 to 0.05; $P = 0.16$), although considerable heterogeneity was observed. Subgroup analysis showed that vitamin D supplementation for participants with clinically significant depressive symptoms or depressive disorder had a moderate, statistically significant effect (2 studies: SMD, −0.60; 95% CI, −1.19 to −0.01; P = 0.046), but a small, nonsignificant effect for those without clinically significant depression (5 studies: SMD, −0.04; CI, −0.20 to 0.12; P = 0.61). Most trials had unclear or high risk of bias. Studies varied in the amount, frequency, duration, and mode of delivery of vitamin D supplementation.

Conclusion—Vitamin D supplementation may be effective for reducing depressive symptoms in patients with clinically significant depression; however, further high quality research is needed.

Meta-análise (7 estudos --> n=3191 participantes)

A suplementação de vitamina D pode contribuir para reduzir sintomas depressivos em pacientes com depressão clinicamente significativa.

Psychosom Med; 76(3):190-6, 2014
doi: 10.1097/PSY.0000000000000044

VITAMINA E

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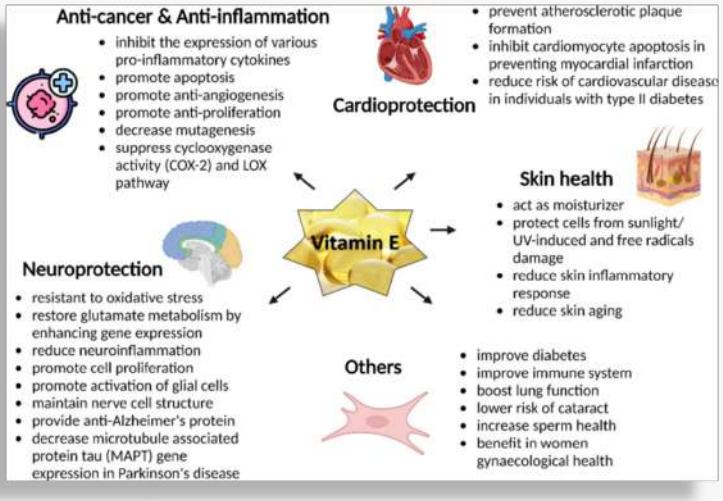
VITAMINA E



Food Measure; 17, 6144-6156, 2023
doi: 10.1007/s11694-023-02042-z

- AÇÃO ANTIOXIDANTE
- AÇÃO ANTI-INFLAMATÓRIA
- AÇÃO CARDIOPROTETORA
- AÇÃO NEUROPROTETORA
- FERTILIDADE
- MODULAÇÃO IMUNOLÓGICA
- ESTÉTICA

dentre outras...

VITAMINA E

Vitamin E supplementation in the treatment on nonalcoholic fatty liver disease (NAFLD): Evidence from an umbrella review of meta-analysis on randomized controlled trials

Objective: We conducted this umbrella review of meta-analysis on randomized controlled trials to clarify the effects of vitamin E administration on alanine aminotransferase (ALT), aspartate aminotransferase (AST), gamma-glutamyl transferase (GGT), degrees of steatosis and fibrosis in patients with nonalcoholic fatty liver disease (NAFLD).

Methods: PubMed, MEDLINE, SCOPUS, EMBASE, and Web of Science were searched to identify pertinent articles published up to June 2023. To calculate the overall effect size (ES) and confidence intervals (CI), random-effects model was used.

Results: Six meta-analyses were included in the umbrella review. By pooling ES based on the random-effects model, we found that vitamin E supplementation significantly decreased ALT (ES -6.47, 95% CI -11.73 to -1.22, P = 0.01), AST (ES -5.35, 95% CI -9.78 to -0.93, P = 0.01), degrees of fibrosis (ES -0.24, 95% CI -0.36 to -0.12, P < 0.001) and steatosis (ES -0.67, 95% CI -0.88 to -0.45, P < 0.001) in NAFLD patients, but had no effect on GGT. In the subgroup analyses, we detected that fibrosis scores notably decreased when vitamin E dosage was >600 IU/day (ES -0.25, 95% CI -0.41 to -0.10, P = 0.002) and when the treatment duration was ≥12 months (ES -0.24, 95% CI -0.37 to -0.12, P < 0.001).

Conclusion: Vitamin E administration improves ALT, AST, fibrosis, and steatosis in NAFLD subjects. Fibrosis scores were significantly reduced when vitamin E dosage exceeded 600 IU/day or with a treatment duration of at least 12 months.

Meta-análise englobando 6 meta-análises

A suplementação de vitamina E melhorou AST, ALT, fibrose e esteatose em pacientes com doença hepática gordurosa não-alcoólica.

J Dig Dis; 24(6-7):380-389, 2023
doi: 10.1111/1751-2980.13210

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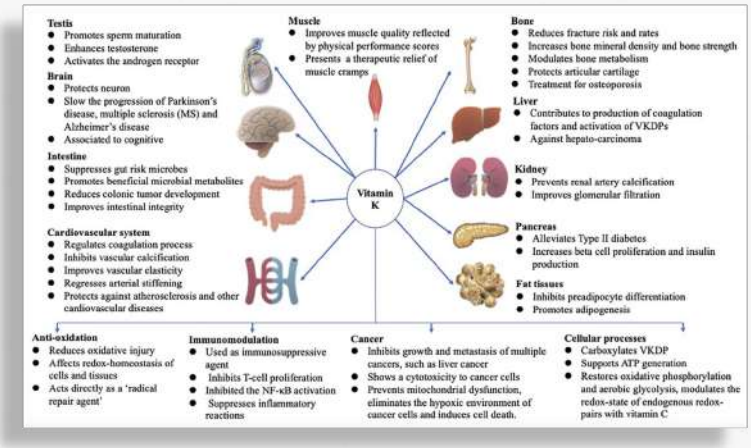
VITAMINA K

VITAMINA K



Front Immunol; 12:791565, 2022
doi: 10.3389/fimmu.2021.791565

- COAGULAÇÃO SANGUÍNEA
- SAÚDE ÓSSEA
- SAÚDE CARDIOVASCULAR
- AÇÃO ANTIOXIDANTE
- AÇÃO ANTI-INFLAMATÓRIA
- MODULAÇÃO IMUNOLÓGICA
- SAÚDE INTESTINAL

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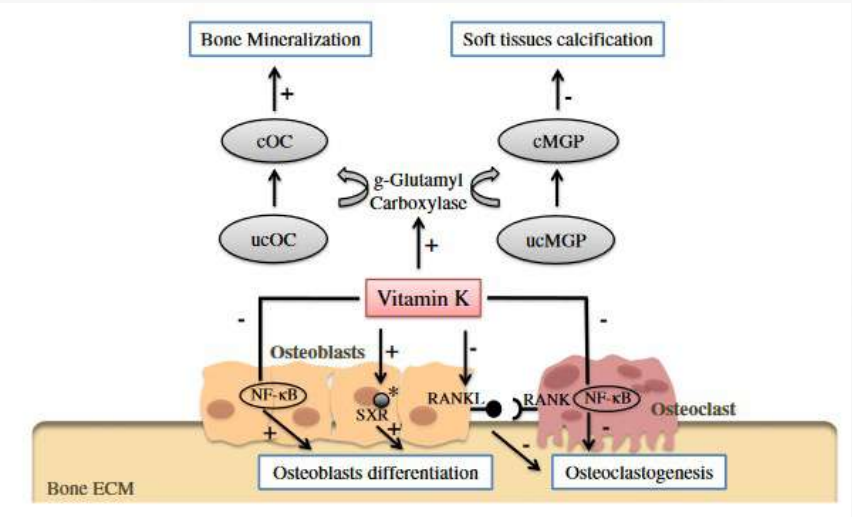
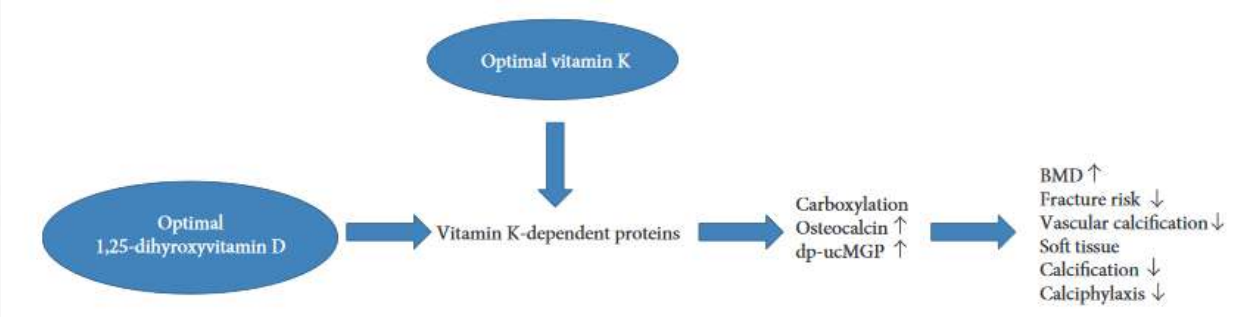
VITAMINA K



Palermo A et al. Vitamin K and osteoporosis: Myth or reality? Metabolism; 70: 57-71, 2017

VITAMINA K e VITAMINA D



Int J Endocrinol; 2017: 7454376, 2017
doi: 10.1155/2017/7454376

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VITAMINA K

The effect of vitamin K supplementation on cardiovascular risk factors: a systematic review and meta-analysis

Cardiovascular disease (CVD) is one of the most important diseases which controlling its related risk factors, such as metabolic and inflammatory biomarkers, is necessary because of the increased mortality risk of that. The aim of our meta-analysis is to reveal the general effect of vitamin K supplementation on its related risk factors. Original databases were searched using standard keywords to identify all randomized clinical trials (RCTs) investigating the effects of vitamin K on CVD. Pooled weighted mean difference (WMD) and 95 % confidence intervals (95 % CI) were achieved by random-model effect analysis for the best estimation of outcomes. The statistical heterogeneity was determined using the Cochran's Q test and I^2 statistics. Seventeen studies were included in this systematic review and meta-analysis. The pooled findings showed that vitamin K supplementation can reduce homeostatic model assessment insulin resistance (HOMA-IR) (WMD: −0·24, 95 % CI: −0·49, −0·02, $P = 0·047$) significantly compared to the placebo group. However, no significant effect was observed on other outcomes. Subgroup analysis showed a significant effect of vitamin K2 supplementation compared to vitamin K1 supplementation on HOMA-IR. However, no significant effect was observed on other variables. Also, subgroup analysis showed no potential effect of vitamin K supplementation on any outcome and omitting any articles did not affect the final results. We demonstrated that supplementation with vitamin K has no effect on anthropometrics indexes, CRP, glucose metabolism, and lipid profile factors except HOMA-IR.

Meta-análise demonstrou que a suplementação de Vit K reduz HOMA-IR
Além disso, K2 foi melhor que K1 no HOMA-IR

J Nutr Sci; 13:e3, 2024
doi: 10.1017/jns.2023.106

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The relationship between vitamin K and T2DM: a systematic review and meta-analysis

Background: Previous studies have shown the potential role of vitamin K supplementation in the prevention and treatment of many diseases. However, the effect of vitamin K supplementation on blood glucose remains controversial. The purpose of this study was to assess the effects of vitamin K supplementation on glycemia-related indicators, including Fasting Blood Sugar (FBS), Fasting Insulin (FINS) and Homeostasis Model Assessment of Insulin Resistance (HOMA-IR). The potential association between vitamin K and type 2 diabetes mellitus (T2DM) risk was also evaluated. *Methods*: Up to April 2023, Cochrane, PubMed, Web of Science, Medline and EMBASE databases were searched to assess the effects of vitamin K on blood glucose and the risk of developing T2DM. *Results*: A *meta*-analysis of seven studies (813 participants) found vitamin K supplementation significantly reduced FBS (SMD = −0.150 mg dl^{-1}, 95% CI = −0.290, −0.010 mg dl^{-1}) and HOMA-IR (SMD = −0.200, 95% CI = −0.330, −0.060), but not FINS. Five studies with a total of 105 798 participants were included in the *meta*-analysis of the association between vitamin K and T2DM. The results showed that vitamin K was associated with the reduced risk of developing T2DM (HR = 0.79, 95% CI [0.71–0.88], $P < 0.001$). *Conclusion*: The *meta*-analysis demonstrated that vitamin K supplementation had a significant effect on the regulation of FBS and HOMA-IR in the population. Moreover, vitamin K was associated with the reduced risk of developing T2DM.

VITAMINA K

Meta-análise demonstrou que a suplementação de Vit K reduz HOMA-IR e glicemia de jejum; e também reduziu o risco de desenvolver DM2

Food Funct; 14(19):8951-8963, 2023
doi: 10.1039/d3fo02943c

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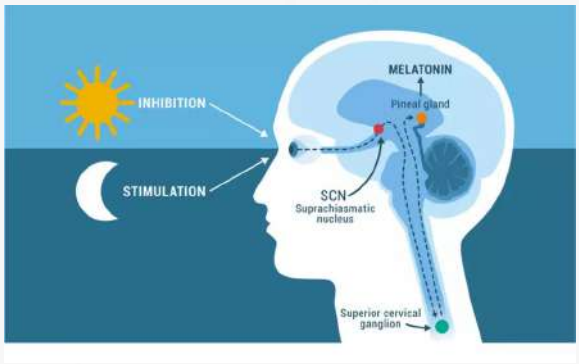
MELATONINA

MELATONINA

***N*-acetyl-5-methoxytryptamine**

É uma indoleamina primariamente produzida pela glândula pineal e secretada na corrente sanguínea.



BMC Med; 16(1):18, 2018
doi: 10.1186/s12916-017-1000-8

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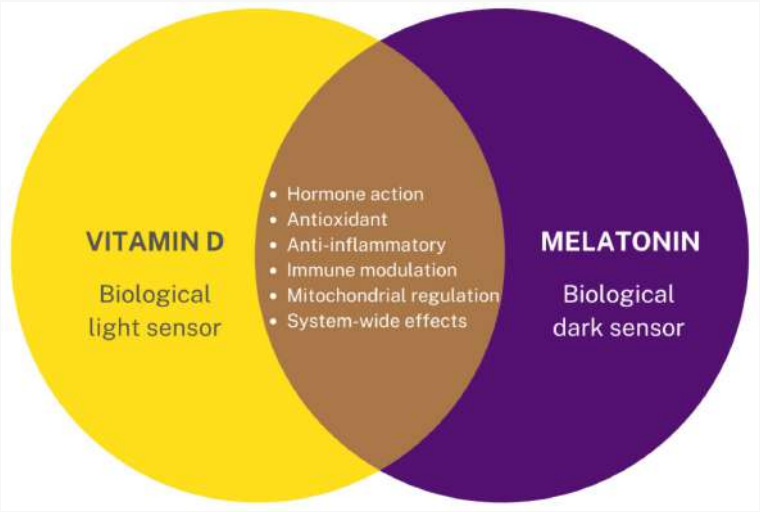
Is Melatonin the "Next Vitamin D"?: A Review of Emerging Science, Clinical Uses, Safety, and Dietary Supplements

MELATONINA



Nutrients; 14(19):3934, 2022
doi: 10.3390/nu14193934

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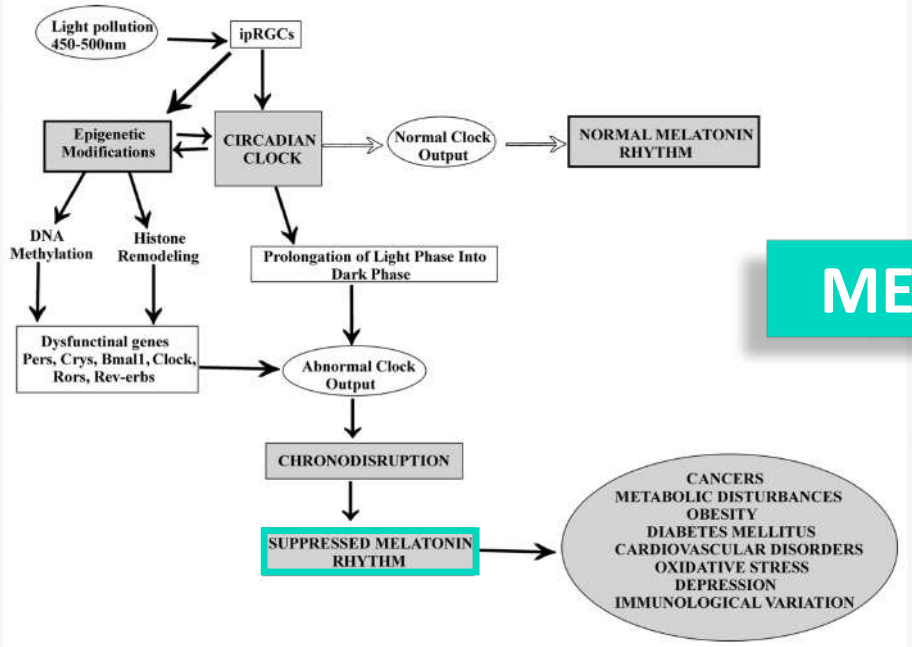

MELATONINA

Curr Environm Eng; 6(2): 111-125, 2019
doi: 10.2174/2212717806666190619120211

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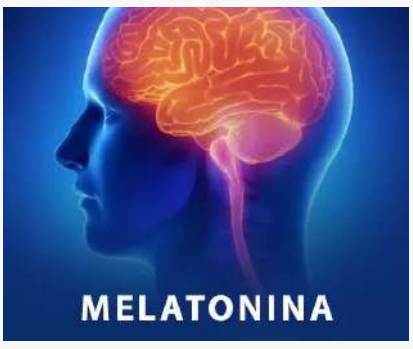
PRINCIPAIS APLICAÇÕES



Nutrients; 14(19):3934, 2022
doi: 10.3390/nu14193934

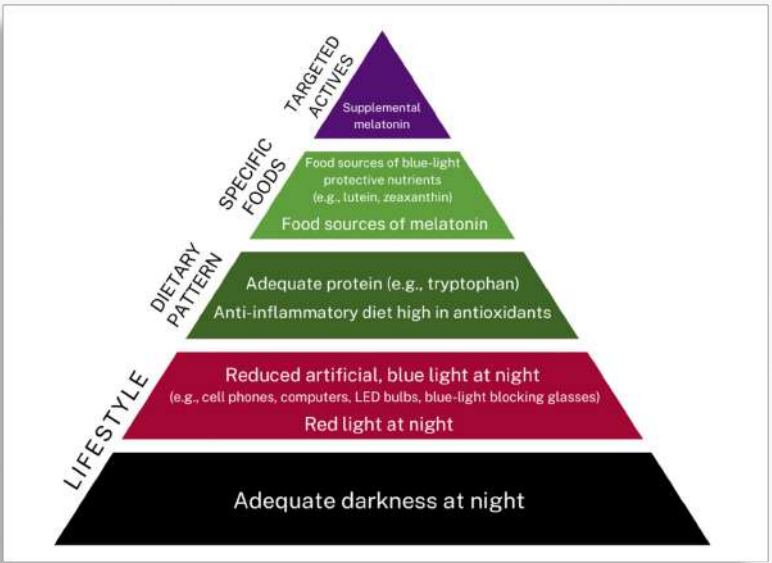
Melatonin and health: an umbrella review of health outcomes and biological mechanisms of action

MECANISMOS DE AÇÃO

- AÇÃO ANTIOXIDANTE
- AÇÃO ANTI-INFLAMATÓRIA
- AÇÃO ANTI-HIPERTENSIVA
- AÇÃO NEUROPROTETORA
- REGULAÇÃO DO METABOLISMO DE LIPIDIOS E DE CARBOIDRATOS
- AÇÃO IMUNOMODULADORA
- AÇÃO ANTI-APOPTOSE
- MODULAÇÃO HORMONAL
- REGULAÇÃO CIRCADIANA
- MODULAÇÃO DA FUNÇÃO MITOCONDRIAL

dentre outros...

BMC Med; 16(1):18, 2018
doi: 10.1186/s12916-017-1000-8



Mudanças nutricionais e de estilo de vida para otimizar a produção de melatonina

A suplementação é a cereja do bolo

Nutrients; 14(19):3934, 2022
doi: 10.3390/nu14193934

Effect of melatonin supplementation on sleep quality: a systematic review and meta-analysis of randomized controlled trials

MELATONINA

Conclusion

In conclusion, combined data from interventional studies revealed a significant improvement in sleep quality after melatonin intervention. This significant effect was also seen in subjects with respiratory diseases, metabolic disorders, and primary sleep disorders, but there was not any significant effect on mental disorders, neurodegenerative diseases, and other diseases.

23 estudos RCTs
Duração: 2 a 24 semanas
Doses: 2 a 10 mg/dia

A suplementação de melatonina melhorou a qualidade do sono em indivíduos com doenças respiratórias, doenças metabólicas e desordens primárias de sono.

J Neurol; 269(1):205-216, 2022
doi: 10.1007/s00415-020-10381-w

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Effects of Melatonin Supplementation on Insulin Levels and Insulin Resistance: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

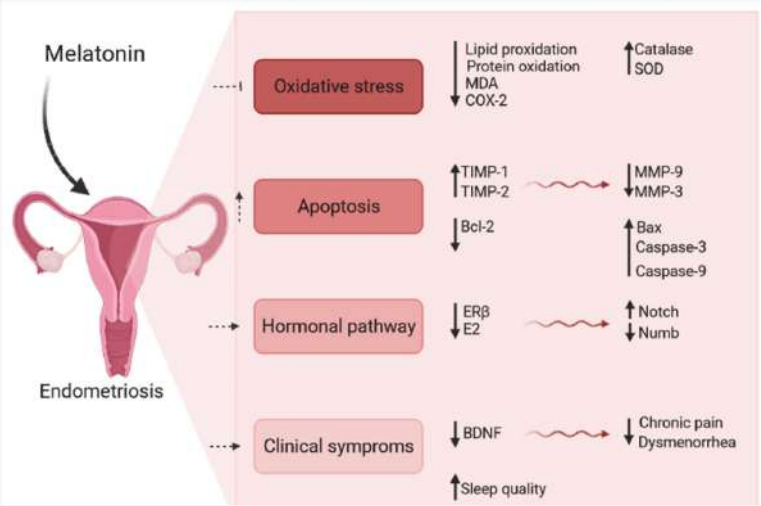
MELATONINA

Insulin resistance (IR) is a pivotal process in various metabolic diseases. The well-known treatment is lifestyle modification and medication therapy, which may result in poor compliance and side effects. Melatonin has been suggested to have a role in glucose metabolism, yet the results across studies have been inconsistent. Therefore, we performed a systematic review to evaluate the effects of melatonin supplementation on insulin levels and IR. We searched PubMed, Embase, Cochrane Central Register of Controlled Trials, and ClinicalTrials.gov, and identified randomized controlled trials (RCTs) published prior to August 2020. Articles were reviewed, selected and extracted by two reviewers independently. In total, 8 RCTs of 376 participants were included. Data were pooled using a random-effects model, with mean differences (MDs) and 95% confidence intervals (CIs). Our results showed that melatonin administration significantly reduced insulin levels and homeostasis model assessment of insulin resistance (HOMA-IR), and increased the quantitative insulin sensitivity check index (QUICKI). We conclude that melatonin ameliorated hyperinsulinemia, insulin resistance, and insulin sensitivity, and the results are an update of a previous meta-analysis. Although more investigations are required, we clearly provide evidence for the use of melatonin as an adjuvant treatment for metabolic disorders involving IR.

A suplementação de melatonina reduziu os níveis de insulina e o HOMA-IR, e aumentou a sensibilidade à insulina.

Horm Metab Res; 53(9):616-624, 2021
doi: 10.1055/a-1544-8181

Therapeutic effects of melatonin on endometriosis, targeting molecular pathways: Current knowledge and future perspective



MELATONINA E ENDOMETRIOSE

Pathol Res Pract; 243:154368, 2023
doi: 10.1016/j.prp.2023.154368

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Effects of Melatonin Supplementation on Hormonal, Inflammatory, Genetic, and Oxidative Stress Parameters in Women With Polycystic Ovary Syndrome

Purpose: The aim of the current study was to evaluate the effect of melatonin administration on clinical, hormonal, inflammatory, and genetic parameters in women with polycystic ovarian syndrome (PCOS).

Methods: The present randomized, double-blinded, placebo-controlled clinical trial was conducted among 56 patients with PCOS, aged 18–40 years old. Subjects were randomly allocated to take either 5 mg melatonin supplements ($n = 28$) or placebo ($n = 28$) twice a day for 12 weeks.

Results: Melatonin administration significantly reduced hirsutism (β −0.47; 95% CI, −0.86, −0.09; $P = 0.01$), serum total testosterone (β −0.11 ng/mL; 95% CI, −0.21, −0.02; $P = 0.01$), high-sensitivity C-reactive protein (hs-CRP) (β −0.61 mg/L; 95% CI, −0.95, −0.26; $P = 0.001$), and plasma malondialdehyde (MDA) levels (β −0.25 μmol/L; 95% CI, −0.38, −0.11; $P < 0.001$), and significantly increased plasma total antioxidant capacity (TAC) levels (β 106.07 mmol/L; 95% CI, 62.87, 149.28; $P < 0.001$) and total glutathione (GSH) (β 81.05 μmol/L; 95% CI, 36.08, 126.03; $P = 0.001$) compared with the placebo. Moreover, melatonin supplementation downregulated gene expression of interleukin-1 (IL-1) ($P = 0.03$) and tumor necrosis factor alpha (TNF-α) ($P = 0.01$) compared with the placebo.

Conclusions: Overall, melatonin administration for 12 weeks to women with PCOS significantly reduced hirsutism, total testosterone, hs-CRP, and MDA, while increasing TAC and GSH levels. In addition, melatonin administration reduced gene expression of IL-1 and TNF-α.

MELATONINA E SOP

Randomizado, duplo-cego, placebo-controlado

Mulheres com SOP com idades entre 18 e 40 anos

G1: 2x de 5 mg
G2: placebo

12 semanas

Houve redução de hirsutismo, testosterona total, PCR-US e malondialdeído, enquanto aumentou a capacidade antioxidante total e os níveis de glutationa.

Front Endocrinol (Lausanne); 10:273, 2019
doi: 10.3389/fendo.2019.00273

MELATONINA – Como usar?

Dose	Physiological dose (0.3–1.0 mg) Supraphysiological dose for occasional use (≥3 mg) Therapeutic dose prescribed by a qualified healthcare practitioner

Maior parte dos estudos usa entre 2 e 10 mg para outras condições clínicas
Crianças e adolescentes → 500 mcg até 10 mg (2 semanas até 3 meses)

TIMING: ideal 30 a 60 minutos antes de deitar (estudos com até 4h antes), preferencialmente no escuro.
DEPENDE DO OBJETIVO NA VERDADE (meia-vida de 1 a 2 horas)

Nutrients; 14(19):3934, 2022
doi: 10.3390/nu14193934

Obrigado!

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