The link between vitamin D metabolism and sleep medicine.

McCarty DE, Chesson AL Jr, Jain SK, Marino AA.

Division of Sleep Medicine, Department of Neurology, Louisiana State University Health Sciences Center, P.O. Box 33932, 1501 Kings Highway, Shreveport, LA 71130, USA.

BACKGROUND: Vitamin D is a hormone that interacts with intranuclear receptors to effect transcriptional changes in many cell types including those in gut, bone, breast, prostate, brain, skeletal muscle, and the immune system. Inadequacy of vitamin D is widely prevalent, and leads to the classic diseases of bone demineralization as well as to more recently recognized problems such as nonspecific pain and noninflammatory skeletal myopathy, which may disrupt sleep and directly cause daytime impairment.

SUMMARY OF FINDINGS: Emerging lines of evidence suggest that low vitamin D levels increase the risk for autoimmune disease, chronic rhinitis, tonsillar hypertrophy, cardiovascular disease, and diabetes. These conditions are mediated by altered immunomodulation, increased propensity to infection, and increased levels of inflammatory substances, including those that regulate sleep, such as tumor necrosis factor alpha (TNF-α), interleukin (IL)-1, and prostaglandin D2 (PD2).

CONCLUSION: Together, the recent reports suggest a role for inadequate vitamin D in the development of symptoms of wake impairment commonly associated with sleep disorders. Persistent inadequacy of vitamin D may also increase the risk for obstructive sleep apnea via promotion of adenotonsillar hypertrophy, airway muscle myopathy, and/or chronic rhinitis. Much remains to be learned concerning the complex relationship between chronically low levels of vitamin D, normal sleep, sleep disruption, and daytime neurocognitive impairment.

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