Fighting infections with vitamin D

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FROM ABSTRACT

Sunlight can treat tuberculosis, a phenomenon observed more than a century ago. The mechanism now becomes more clear, and it involves induction of a microbe-fighting peptide by vitamin D.

THIS AUTHOR ALSO NOTES:

In 1895, Niels Finsen of Denmark effectively treated tuberculosis with exposure to high-intensity light produced from an electric arc lamp. This phototherapy "cured or substantially improved the disease in about 95% of affected people, and by the 1920s sun exposure for the treatment of pulmonary tuberculosis had become routine."

Finsen was awarded a Nobel Prize in 1903 for this treatment.

Sunlight helps us battle tuberculosis and other microbes "by stimulating the synthesis of vitamin D, [which] upregulates the expression of a microbe-fighting peptide."

"Most multicellular organisms produce antimicrobial peptides (AMPs) and proteins, which can kill viruses, fungi, protozoa, bacteria and other microbes."

In people, the AMPs LL-37 (also known as cathelicidin), attract monocytes and neutrophils. The active form of vitamin D, 1,25-D3, boosts levels of LL-37 in human neutrophils. This improves the immune response.

"Vitamin D stimulates the synthesis of the potent antimicrobial peptide LL-37 in skin and circulating phagocytic cells."

Experiments show that LL-37 within phagocytic vacuoles containing engulfed bacteria, kills tuberculosis.

"Macrophages more effectively killed ingested M. tuberculosis after they were exposed to 1,25-D3."

"Sunlight, by raising serum levels of vitamin D, can increase the capacity of circulating monocytes and macrophages to kill certain microbes they are exposed to."

American blacks appear to be particularly susceptible to infection by M. tuberculosis because they have substantially lower serum vitamin D levels than whites, as a result of the greater UV shielding afforded by their skin's higher melanin content. Treatment with vitamin D3 should augment the microbicidal capacity of monocytes in blacks.

"We currently base vitamin D requirements on amounts required to sustain optimal health of our skeleton. The studies reported here suggest that optimal functioning of our innate immune system might require more vitamin D."

"Should we be examining the therapeutic benefits of vitamin D for acute bacterial or viral infections, as others have suggested?"

Should we consider administering vitamin D to people with dysentery, atopic dermatitis or burns?

"Perhaps in the future we might be able to treat or prevent certain infectious diseases with safe and inexpensive substances that induce expression of endogenous antimicrobial peptides."

KEY POINTS FROM DAN MURPHY

1) It has been known for more than a century that sunlight can treat tuberculosis.

2) In 1895, Niels Finsen of Denmark effectively treated tuberculosis with exposure to high-intensity light produced from an electric arc lamp. This phototherapy "cured or substantially improved the disease in about 95% of affected people, and by the 1920s sun exposure for the treatment of pulmonary tuberculosis had become routine."

3) Sunlight effectively treats tuberculosis because it produces vitamin D, which in turn produces a microbe-fighting peptide.

4) Treating tuberculosis with sunshine was so effective that its discoverer was awarded the Nobel Prize in 1903.

5) Sunlight helps us battle tuberculosis and other microbes "by stimulating the synthesis of vitamin D, [which] upregulates the expression of a microbe-fighting peptide."

6) Vitamin D stimulates the synthesis of the potent antimicrobial peptide called LL-37 in skin and in circulating phagocytic cells that make up the innate immune response. This improves the immune response.

7) Macrophages [innate immune response] more effectively kill tuberculosis after they are exposed to vitamin D3.

8) American blacks are particularly susceptible to infection by tuberculosis because they have substantially lower serum vitamin D levels than whites, as a result of the greater UV shielding afforded by their skin's higher melanin content. Treatment with vitamin D3 should augment the microbicidal capacity of monocytes in blacks.

9) "We currently base vitamin D requirements on amounts required to sustain optimal health of our skeleton. The studies reported here suggest that optimal functioning of our innate immune system might require more vitamin D."

10) "Perhaps in the future we might be able to treat or prevent certain infectious diseases with safe and inexpensive substances that induce expression of endogenous antimicrobial peptides."

COMMENTS FROM DAN MURPHY

This article was complex and I did a good job at simplifying it. Importantly, the author developed a model that highlights the importance of innate intelligence. His model essentially indicates that our primary barrier from infection is the skin. Exposure to ultraviolet radiation from the sun burns the skin. Sunburned skin peals away, breaching the skin's barrier to infection. Consequently, humans who have sunburned skin sustain more infections.

Fortunately, innately, exposure of the skin to sun also increases the production of vitamin D. Increased vitamin D upregulates the production of antimicrobial peptides and proteins, which in turn improves the innate immune response. This improves the immune response against a variety of infections, including tuberculosis.

Because of this study and many others, I personally take 800 IU vitamin D3 per day by consuming two **Vitamin D 400** from **Nutri-West (800-443-3333).** I put the vitamin D into a shake that also contains a number of other nutrients that I believe every one should consume every day. The recipe for the shake is attached.

Every Day, All People
Nutri-West (800-443-3333)

1) Take a multivitamin / mineral supplement:

	Core Level Health Reserve	3 per day

2) Mitochondrial Health:

A)	Acetyl-l-carnitine		
B)	Alpha-lipoic acid	**Complete AG**	3 per day
C)	CoQ 10		

3) Increase Glutathione

A)	N-Acetyl Cysteine, or NAC:	**Complete Glutathione**	3 per day
B)	Undenatured Whey Protein:	**Complete Whey-G**	1 scoop per day

4) Take omega-3s: **Complete Omega-3 Essentials capsules**

3 g / day = 6 capsules per day

OR

Complete Hi-Potency Omege-3 liquid

1 teaspoon per day

5)	Take omega-3 antioxidants	**Complete Omega-3 Co-Factor**	3 per day
6)	Take 800 IU vitamin D3 per day	**Vitamin D 400**	2 per day

New Antioxidant Shake; put into a blender:

3 Core Level Health Reserve

3 Complete AG

3 Complete Glutathione

3 Complete Omega-3 Co-Factors

2 Vitamin D 400

1 cup of organic plain yogurt; children prefer vanilla; vegans can eliminate the yogurt

1 cup of mixed frozen berries

3/4 cup of pomegranate juice (use 1 cup if not using the yogurt)

Blend

After blending add two scoops of **Complete Whey-G** and mix in with a fork (do **Not** blend).
Consume all at once or divide it into thirds to consume throughout day, keep refrigerated.
Take Omega-3s separate, preferably at the end of the day.