“The End of Illness” Needs a Dose of Vitamin D

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The book, *The End of Illness* by David B. Agus, M.D. (Free Press, NY, 2011) may have some good points regarding lifestyle choices, but misses the mark regarding vitamin D by a wide margin. Vitamin D is a natural compound that humans have required forever. Thus, much of what we know about the roles of vitamin D come from ecological (geographical) and observational studies for diseases such as cancer,[1-4] cardiovascular disease,[5,6] and diabetes,[5] as well as all-cause mortality rates.[7] The benefits of vitamin D are well known as shown in reviews.[8,9]

Since Dr. Agus is a medical doctor, he has come to expect randomized controlled trials (RCTs) to be conducted to determine the beneficial and adverse effects of pharmaceutical drugs, which are artificial compounds to which the human body is not accustomed. He used the same expectations for vitamin D in Chapter 6, Proceed with Caution. Instead of looking for successful RCTs, he highlighted two failed RCTs, one regarding pain associated with osteoarthritis, one with a very high annual dose for falls and fractures,[10] and an observational study of serum 25-hydroxyvitamin D [25(OH)D] and prostate cancer incidence.[11] There are a number of RCTs that have provided good evidence that vitamin D reduces the risk of cancer,[12,13] hip fractures,[14] type A influenza,[15] pneumonia,[16] increased survival after diagnosis of cardiovascular disease,[17] and reduced all-cause mortality rate.[18] A recent RCT found that pregnant and nursing women need at least 4000 IU/d and that there are no adverse effects.[19] Thus, Dr. Agus cherry picked papers to support his argument rather than doing a comprehensive review of RCTs of vitamin D supplementation. Nonetheless, not all RCTs have been successful. The reasons why there are not more successful RCTs with vitamin D reported are several: most early studies used only 400 IU/d vitamin D, which is too little for most health outcomes, the beneficial effects of vitamin D for many types of disease have been identified in the past few years, there are many sources of vitamin D such as food, supplements and solar UVB, and there is considerable person-to-person variability in serum 25(OH) D with respect to oral vitamin D intake.

Dr. Agus overlooks another way to evaluate whether something such as vitamin D can be considered causal in relation to disease outcome. The esteemed President of the British Medical Society, A. Bradford Hill, explained the criteria for causality in a biological system in his Presidential Address in 1965.[20] These criteria are: strength of association, consistency, specificity, temporality, biological gradient, plausibility (mechanisms), coherence, experiment (RCTs), and analogy. Later, ruling out confounding factors and bias were added.[21] Not all criteria need be satisfied, and some, such as specificity, do not apply to vitamin D, but the more that are, the better. Hill’s criteria have found good support for many types of cancer,[22] periodontal disease,[23] and multiple sclerosis.[24]

Dr. Agus dismisses the benefit of vitamin D for reducing the risk of cancer based in part on a 2008 International Agency for Research on Cancer (IARC) report.[25] The authors of that report were primarily dermatologists who consider their mission to keep people out of the sun in order to prevent melanoma and skin cancer. This report has been shown to be highly biased.[26] Dr. Agus also suggests that cancer rates are higher at high latitudes due perhaps to genomic effects. This

idea can be shown to be incorrect based on a comparison of cancer rates in Nordic countries based on occupation: those with outdoor occupations have reduced risk of at least 13 types of cancer compared to those with indoor occupations.[27] The measure of UV exposure was the standardized incidence rates for lip cancer less lung cancer for males, which is unlikely to be affected by physical activity.

As for the basic recommendations listed on the dust jacket, aspirin, statins, and annual flu shot, they have some problems. A meta-analysis found that aspirin reduced mortality rates for those being treated for various diseases by about 18% but found no benefit for those generally healthy.[28] Another meta-analysis of over 100,000 participants in RCTs found benefits for all-cause mortality rate (6% reduction), but increased risk of hemorrhagic stroke, major bleeding, and GI tract bleeding.[29] About 1.3% of those taking low-dose aspirin for ten years suffer GI tract bleeding,[30] and about 20% of those taking aspirin or other non-steroidal anti-inflammatory drugs (NSAIDs) who develop upper GI tract bleeding die.[31] Thus, risk of adverse effects of aspirin used by those who are healthy outweigh the benefits.

The use of statins for the general population has a better prognosis. One review found that statin use reduced all-cause mortality rates by 10-17%.[32] However, one of the important effects of statins is to enhance the effects of vitamin D,[33-35] so why not just take vitamin D?

As for flu shots, the evidence that they are effective is limited. One review of ten RCTs found an efficacy of 59% for adults aged 18-65 years.[36] Another review stated “there is strikingly limited good-quality evidence (all GRADE B, C or not existing) of the effectiveness of influenza vaccination on complications such as pneumonia, hospitalization and influenza-specific and overall mortality.”[37] However, a review in 2004 found that “vaccine efficacy were 22% (95% CI = 16-28) for preventing clinically diagnosed cases of influenza and 63% (95% CI = 53-71) for preventing laboratory confirmed cases of influenza.”.[38] One problem with report of influenza vaccine effectiveness is selection bias.[39] Who is going to fund and publish a study showing that influenza vaccination is not effective?

On the other hand, an RCT on school children in Japan showed that 1200 IU/d vitamin D3 reduced the risk of type A influenza by about 64%.[40] An RCT in Kabul showed vitamin D reduced the risk of pneumonia among children.[41] An ecological study found that solar UVB doses explained half of the case-fatality rates during the 1918-19 pandemic influenza in the United States, largely due to pneumonia.[42] Thus, flu shots and vitamin D appear to have similar beneficial effects for type A influenza including the H1N1 influenza that struck in 1918-19 and 2009.

Dr. Agus calls oral intake of vitamin D unnatural. However, it is oral intake of vitamin D from fish that permitted people to live in the Arctic for millennia,[43,44] where there is a five-month vitamin D winter.[45]

Unlike aspirin, there are no adverse effects of vitamin D unless one takes more than 20,000 IU/d for an extended period, in which case hypercalcemia may develop. Vitamin D researchers have recommended serum 25(OH)D concentrations of 30-40 ng/ml (75-100 nmol/l).[9] This value is much higher than the 20 ng/ml (50 nmol/l) and 600 IU/d recommended by the Institute of Medicine (IOM).[46] Unfortunately, the IOM committee relied only on RCTs and not the wealth of

information about the health benefits of vitamin D from ecological, observational and laboratory studies.[47] In addition, the IOM committee elected not to include RCTs showing benefits if the findings disagreed with their goal to set the recommendation at 600 IU/d vitamin D and 20 ng/ml such as the one by Hollis and colleagues,[19] leading to much higher recommendations for pregnant and nursing women.[48] The Endocrine Society subsequently recommended 30 ng/ml and 1500-2000 IU/d vitamin D3.[49]

Dr. Agus also recommends physical activity, pointing to studies of risk of death from coronary heart disease by occupation; those in occupations with heavy work involved had about half the mortality rate of those with light work in a paper from 1953.[50] As already discussed, workers in occupations with much of the work done outdoors in Nordic countries have lower cancer incidence rates. Thus, physical activity conducted outdoors entails production of vitamin D.

Here is one final word on the importance of vitamin D. It is the tradeoff between protection against UV damage and vitamin D production is the reason why skin pigmentation varies from very dark in the tropical plains and very pale in northern Europe.[43,44] Our modern lifestyle does not permit most people to obtain sufficient vitamin D from the sun, even though 90% of our vitamin D comes from the sun.[51] Thus, supplements are an effective way to obtain sufficient vitamin D for optimal health.[52,53]

The reason the medical system does not like vitamin D is that it is both very inexpensive and very effective at reducing risk of many types of disease, which lowers income and profit.

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Should you supplement with vitamin D or are you getting enough from sunlight & diet? Click here to learn about deficiency, food sources & dosing.Â Many factors can impact the amount of vitamin D your skin makesâ€“including the time of day, season, sunscreen use, latitude, and your skin pigmentation. Vitamin D is also found in certain foods, such as fatty fish like salmon and sardines. Milk and cereal are often fortified with vitamin D. Additionally, many vitamin D supplements are available on the market [1]. Vitamin D overview for health professionals. Research health effects, dosing, sources, deficiency symptoms, side effects, and interactions here.Â Vitamin D has other roles in the body, including reduction of inflammation as well as modulation of such processes as cell growth, neuromuscular and immune function, and glucose metabolism [1-3].Â After reviewing data on vitamin D needs, an expert committee of the Food and Nutrition Board (FNB) at the National Academies of Sciences, Engineering, and Medicine (NASEM) concluded that people are at risk of vitamin D deficiency at serum 25(OH)D concentrations less than 30 nmol/L (12 ng/mL; see Table 1 for definitions of "deficiency" and "inadequacy") [1]. Vitamin D, nicknamed the sunshine vitamin because your body produces it after sun exposure, has long been known to help build strong bones by increasing the body's absorption of calcium and phosphorous. But beginning in 2000, research into vitamin D's role in other health conditions began to expand rapidly.Â For example, a person with a serious illness may have a vitamin D deficiency.Â Some people may need a higher dose, however, including those with a bone health disorder and those with a condition that interferes with the absorption of vitamin D or calcium, says Dr. Manson. Unless your doctor recommends it, avoid taking more than 4,000 IU per day, which is considered the safe upper limit. Vitamin D Dosage needs to be tailored to each person. This is partly because the dose you need depends on the vitamin D level you are trying to achieve. This is what we mean by vitamin D levels. 25(OH)D Blood levels.Â Use this simple rule to calculate your basic vitamin D dosage, based on your body mass. The answer will be in International Units of vitamin D, or IU. Basic daily vitamin D dosage = Body mass in pounds * 27. (Or Body Mass in Kilograms * 60 if you prefer metric.) At the end of the year, the researchers discovered that those who had been given the higher vitamin D doses had 40 percent fewer respiratory infections overall. However, when broken down by infection type, itâ€™s worth noting that it was simple upper respiratory infections, such as colds and coughs, that were reduced rather than serious infections like pneumonia.Â The amount of time that you need to spend outdoors to get enough vitamin D varies, but generally speaking, 10 to 15 minutes of exposure a few times a week without sunscreen with your arms and legs uncovered should do the trick.Â In addition to respiratory illness, getting enough vitamin D could help reduce your risk of cancer and chronic inflammatory diseases.