

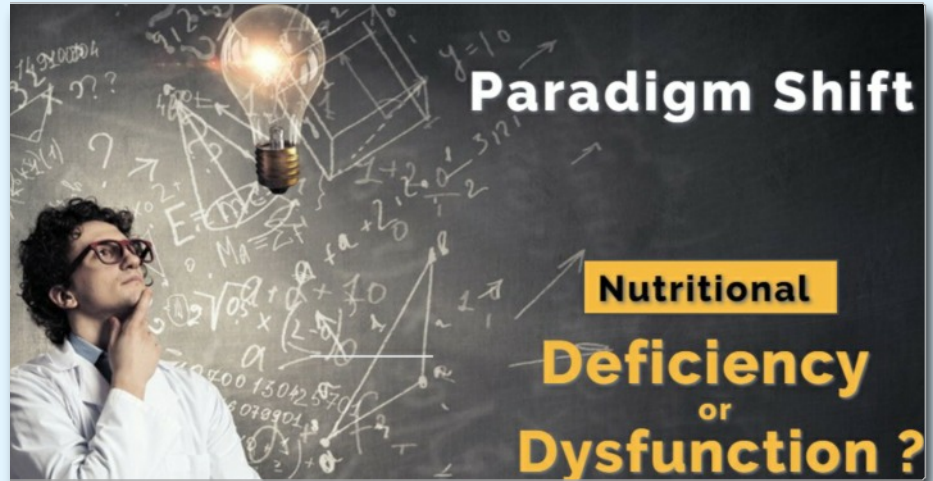
Nutritional Deficiency or Dysfunction?

"It adds new emphasis to the importance of a clean anti-inflammatory diet & foundational nutrients to support the process we are trying to enhance."

I want to share a theoretical concept that may be the key to why we can be successful with one patient and have minimal results applying the same strategy to a second one. This concept comes from Dr. Alex Vasquez and can be seen in more detail through his writings and webinars to the right. We're talking about "the progression from deficiency to dysfunction" and ultimately to a "dysregulation of homeostasis" as it pertains to a nutrient and/or system.

He first introduced the concept in terms of glutathione, the holy grail of antioxidants. Glutathione deficiency "is different from a dysregulation of glutathione homeostasis". Let's consider how we address a deficiency of glutathione. GSH is synthesized from the amino acids glutamate, glycine and cysteine.

Cysteine is recognized as the rate-limiting substrate. So if someone needs more glutathione, it's common to give N-acetyl-L-cysteine, NAC for short. You can see this



concept in hospital emergency settings with patients poisoned with acetaminophen who are treated (exclusively) with NAC to produce glutathione for antioxidant defense and acetaminophen conjugation. This thinking saves LIVERS and saves lives.

On the other hand "dysregulation of glutathione homeostasis" implies a higher level of complexity than "glutathione deficiency". Dysregulation of glutathione homeostasis suggests that more than NAC is necessary to remedy the problem. For example, adding glutamine with NAC significantly changes the dynamics.

Glutamine can be converted to glutamate which, as I mentioned, combines with glycine and cysteine to make GSH. Adding glutamine takes the therapy to another level. Let me explain; oxidized glutathione (GSSG) needs to be recreated, which is metabolically demanding, or it needs to be reduced back into two molecules of glutathione (GSH). By adding glutamine to NAC, we are also stimulating the necessary enzymes and providing the necessary substrate to maintain higher levels of reduced GSH.

Let's look at some of the other things glutamine accomplishes. Glutamine has a

major role as an antioxidant and helps regulate pH. Glutamine is also anti-inflammatory because it inhibits NF-kB and mTOR. Glutamine improves the gut microbiome and the maintenance of intestinal barrier function.

By accomplishing these tasks not only is more glutathione made and oxidized glutathione reduced, but the overall need for this essential anti-oxidant is reduced. In a real sense, proper levels of glutamine spare glutathione so it can do what it does best.

In the same way glycine, magnesium, riboflavin, niacin, selenium and CoQ 10 are cofactors needed to support or enhance glutathione homeostasis. In other words, one can give NAC but if these other pathways are comprised because of a lack of cofactors like riboflavin or niacin, glutathione production and utilization will be compromised.

So for a correction of GSH deficiency, give NAC. But for a correction of GSH dysfunction, give NAC with glutamine, add glycine, magnesium, balance pH (bicarbonate/citrate), riboflavin, niacin, selenium, and CoQ10.

Dr. Vasquez was kind enough to give other examples, for instance, magnesium. Just about everyone needs more magnesium because intake is low and losses are significant. But giving someone magnesium by itself without correcting or considering pH balance, glutathione status, and vitamin D levels are going to be less effective than a more complete plan that addresses these and more. So for a correction of magnesium deficiency, give magnesium. But for a correction of magnesium dysfunction, give magnesium, evaluate the need for pH correction (citrate/bicarbonate), assess digestion, and various B vitamins should be considered.

Let's use the same thinking for vitamin D. Many people need more vitamin D. But giving

them more vitamin D does not ensure that all the other "cogs in the wheel" are ready and metabolically available. And perhaps that is why some people don't experience the benefits supported by the literature. We know that vitamin D needs vitamin A and works with vitamin K, especially K2. Magnesium is also needed. So for a correction of vitamin D deficiency, give vitamin D. For a correction of vitamin D dysfunction, give vitamin D, vitamin A, vitamin K1 and K2, magnesium, and correct systemic pH.

Again, this would explain why someone can take vitamin D and still have low blood levels or have sufficient levels but not experience the full benefits. Of course this is an ongoing discussion and one that Dr. Vasquez will articulate in more detail.

To me this is a major paradigm shift in the way nutrition is applied clinically. And it adds new emphasis to the importance of a clean anti-inflammatory diet and foundational nutrients to support the process we are trying to enhance. Let's come full circle back to our original glutathione example. By giving NAC we support GSH enhancement; but by adding ProMulti-Plus, L-Glutamine and Bio-DK Caps, we can be sure we are addressing dysregulation of glutathione homeostasis.

You can see a link to the right to give the Biotics products in the categories we have discussed. By taking the time to explain some of these processes to your patients in simple terms you are demonstrating to them that you are the expert in this field. These concepts will not only increase their foundational health but YOU will be the one that comes to mind when your patients want to make a referral.

Thanks for reading this week's Tuesday Minute edition. I look forward to being with you next Tuesday.