SELENIUM IN HEALTH By Dr. John Fudens HMC DVM PH

Selenium, an essential mineral, functions as an antioxidant (protects against dangerous free radical oxygen) and is part of another antioxidant, glutathione peroxide. Deficiencies of these substances weaken the immune system and make us more susceptible to infections. Research and findings are pointing to a larger more profound role for selenium. There is strong evidence that where the soil is deficient in selenium deadly viruses are occurring and mutating.

Zaire has extremely low soil levels of selenium and widespread selenium deficiencies in the human population. Zaire is where the Ebola and HIV-1 viruses first appeared. In China a common influenza virus mutates into a dangerous form in areas where people are selenium deficient. E. Will Taylor Ph.D., a viral researcher at the University of Georgia, Athens, has stated that “It is certainly intriguing that a number of viruses have emerged from areas of Africa that are selenium deficient”.

There are three pieces to this selenium virus puzzle. First is the discovery that a selenium deficiency triggers a mutation in the Coxsackie virus. The common form of this virus is usually benign causing symptoms of a cold/sore throat. The mutation form, however, attacks the heart causing Keshan disease (a type of cardiomyopathy--enlarged heart). In China, this condition is known to be associated with selenium deficiency and because it is seasonal in nature researchers suspect an infectious agent. Studies then uncovered the Coxsackie virus which infects 20 million Americans every year.

Melinda Beck Ph.D., a virologist at the University of North Carolina, and Orville Levander Ph.D., a Nutritional Chemist at USDA’s Agricultural Research Service, described how a common Coxsackie virus mutated into a deadly, rapidly reproducing strain when a person or animal was Selenium or Vitamin E deficient. When the diet was enriched with Selenium or Vitamin E, the virus did not mutate. Once mutated, the virus could infect and was deadly to a person or animal even though the Selenium intake was adequate.

Beck and Levander compared the genetic structure of the benign “parent” Coxsackie virus to that of the virulent mutant form. There were six specific genetic changes in the mutant form that occurred in Selenium deficiencies. These Coxsackie virus infections are made worse because selenium deficiencies weaken the host’s immune system preventing the virus from being attacked by the antibodies that are present to protect us. The free radical oxygen (which cause viruses to mutate) present in all bodies, more so when Selenium is deficient, allows the virus to mutate in a Selenium deficient body. This might explain why new influenza strains keep emerging from China where Selenium deficient soils are common.

The researchers have stated, “In theory, it would take only one Selenium deficient person or animal to start a whole new family of virus mutants”. E. Will Taylor has an interesting theory. He has proposed that little known genes in HIV control the formation of selenocysteine- a protein with a huge appetite for Selenium. When the virus depletes all of the Selenium in HIV-infected cells, it reproduces and attacks other cells looking for Selenium. The more Selenium is used by HIV, the less is available for the immune system to function properly. In AIDS patients the threat to life is from the opportunistic infections present in the weakened immune state. Supplemental Selenium would do two things. First it would feed the virus so there would be no need to scavenge the body for Selenium. Second it would allow the immune system to function at or close to peak ability so secondary infection could be resisted. Genetic evidence and studies using Selenium in treating AIDS patients are suggesting this theory is true. These studies show Selenium inhibits HIV in the test tube and that AIDS patients gain weight, have an increased general feeling of well-being and have increased CD4 T-cells when given high doses of Selenium supplements.

The next also comes from Taylor. He has studied the Ebola-Selenium connection and states that Ebola has genes dependent on Selenium. When Selenium levels drop, in Ebola-infected cells, the virus reproduces and spreads throughout the body searching for Selenium. The difference, he has found, is that the Zaire strain of Ebola needs ten times more Selenium then HIV and this may account for the speed in which it kills: 75% of the people infected with Ebola die within 3 weeks.

According to Taylor, Selenium deficiency in host populations may foster viral replication, trigger outbreaks of viruses and facilitate more virulent viral strains. There is one more aspect to this puzzle. Sulfur dioxide, a byproduct of burning fossil fuels, reacts with Selenium in the soils making the mineral more difficult for plants to absorb it. It has been suspected that the high fossil fuel burning on this planet and resulting acid rain is contributing to the decrease of Selenium in the food chain. This along with deforestation of jungles and rain forests, in places like Zaire, could be contributing to the breakout of new viral diseases.

To supplement your diet, take the organic soluble (not inorganic) form of Selenium preferably in a proteinate (amino acid) form for more efficient and better absorption and utilization. You should take daily 200 mcg Selenium along with natural mixed tocopherols, vitamin E, 400-800 units. Vitamin E and Selenium taken together daily, give a very nice synergistic effect to the immune system.

 TO YOUR GOOD HEALTH

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