

Inflammasomes and Uric Acid

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Immunology is a field of biomedical research that studies the immune system of many organisms. It deals with the physiological function of the immune system in a healthy state and in a diseased state, and especially, it treats diseases caused by errors of immune system and physiological characteristics of the immune system with interest.

The material I had focused was the relationship of “Inflammasomes and Uric Acid” as it states,

“* Uric acid activates inflammasomes

* Uric acid is monosodium urate (MSU) crystals

*Most of the crystal is sodium.

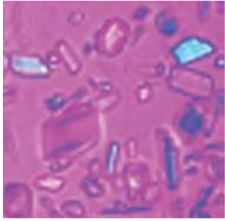
*When MSU is phagocytosed, high amounts of sodium are introduced into the cell.

*The phagocytic vesicle (lysosome) needs to acidify to release MSU into the cytoplasm; this in turn leads to high intracellular Na⁺.

*To deal with this, the cell ingests H₂O, which leads to dilution of K⁺, which is required to activate NLRP3 HCQ / chloroquine prevents lysosomal acidification.”

Upon above illustration, intracellular Sodium(Na⁺) concentration is increased in order to acidify to release MSU into the cytoplasm. I was interested in that fact because most of the gout patients complained about poor sleep. I thought it was because of pain, but now I see it may be due to a

high amounts of sodium which are introduced into the cell disturbing sleep, because sodium (Na⁺) is a well-known inhibitory mineral for the Parasympathetic Nervous System.



Another one of Dr. Nah's material which drew attention for me, was how to identify crystals in the blood sample. It says, "Crystals are rhomboid and weakly \oplus birefringent under polarized light (blue when parallel to light)."

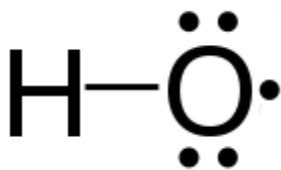
Another slide from Gout lecture illustrates as follows;

Free radical injury

* Free radicals damage cells via membrane lipid peroxidation, protein modification, and DNA breakage.

* Initiated via radiation exposure (eg, cancer therapy), metabolism of drugs (phase I), redox reactions, nitric oxide (eg, inflammation), transition metals, WBC (eg, neutrophils, macrophages) and oxidative bursts.

* Free radicals can be eliminated by scavenging enzymes (eg, catalase, superoxide dismutase, glutathione peroxidase), spontaneous decay, antioxidants (eg, vitamins A, C, E), and certain metal carrier proteins (eg, transferrin, ceruloplasmin).



In order to understand the above explanation about free radical injury, one must understand the concept about what a free radical is. According to the Wikipedia, "A **free radical** is an atomic or

molecular species with unpaired electrons on an otherwise open shell configuration. Free radicals play an important role in combustion, atmospheric chemistry, polymerization, plasma chemistry,

biochemistry, and many other chemical processes. In living organisms, the free radicals superoxide and nitric oxide and their reaction products regulate many processes, such as control of vascular tone and thus blood pressure. They also play a key role in the intermediary metabolism of various biological compounds.” Free radicals are produced in the human body upon exposure to toxins, viruses, germs, or fungi. Free radicals are being generated in our body just through breathing and living, therefore we cannot escape from this type of environment. In other words, under the sun, nothing is new. Slowly oxidizing free radicals are part of the natural process of aging. Cells which are damaged by this type of processing, called “free radicals”, can be eliminated by scavenging enzymes.

Conclusion: People often express that they don’t feel like how they used to, or sometimes feel fatigue, hyperactive, overweight, underweight, feel tired all the time, or have aches and pain. It means these symptoms are simply a reflection of the body out of balance. TCM practitioners are well aware of these types of expression when they face the patients, because the goal of TCM theory is prevention before it goes out of hand. As I review the lecture about immunology, I noticed that tremendous efforts and time have been put into find out and helping the patients who are suffering from all kind of conditions. On the other hand, our human body doesn’t recognize any of those studies. It continues to function as used to through many millions of years, or at least many thousands of years; if someone doesn’t agree with the length of time.

Our body mechanism relies on three fundamental factors; eat, sleep, and defecation. If someone is trying to find out the reason why our body is out of balance, the first thing to consider is these fundamental factors. Eating is the first line of the digestive system which involves a variety of nutrition and ph balance. Sleeping is the next level of rest to rejuvenate the body for the next

day's activities, which is controlled by hormonal activities and balance of SNS/PSNS activity. Defecation is a product of gut processes which involves fluids, enzymes and certain microbes. This is the core foundation of human health. Without making sure these systems are balancing and functioning well, everything else becomes speculation. Diseases which are illustrated in immunology are going to have roots in these areas. As a TCM practitioner, critical analysis of these areas and how they relate to today's world is necessary.