How Crystals Cause Health Issues

The production of crystalline substances is frequent in the systems of biological organisms. In some processes crystals are necessary for life, such as in the kidneys where they help filter toxic heavy metals. However, when the process of crystal production is off balance, problems like kidney stones and gout can occur. Crystals can also be part of other issues, such as asbestos which are crystalline in structure and can cause a type of lung cancer called mesothelioma. Knowing how crystalline structures impact health greatly increases the type and number of treatments available.

The irregular and ridged structure that make up crystals can sometimes irritate the body’s tissue and cause an inflammatory immune response. Another way that the crystalline structures can cause an immune response is when the body’s monocytes, or macrophages, attempt to get rid of the crystals through a digestive process called phagocytosis. While this process normally causes no inflammation, due to the large sizes and irregular jagged shapes that crystals naturally take on, the phagocyte membranes that surround the crystal particles for the digestive process can be punctured and this will release the lysosomes that were meant to break down the particles. When this happens the lysosomes will interact with other cells and inadvertently digest the organelles of other cells which will trigger an inflammatory response.

The most prevalent form of crystalline caused inflammation is from inhaling crystalline particles. We come into contact with these every day through the air we breathe. Air pollution in places like China, exposes the population to high amounts of black carbon nanoparticles, that result from the incomplete burning of petroleum in China’s non-regulated power stations, which can cause the lungs, which already have a lower immune ability, to become easily inflamed due to the high amounts of these crystalline irritants. Cigarette smokers are at a higher risk of lung cancer and this is because of the high amount of crystal structures in the smoke being inhaled. The inflammation that can occur is often described as a smokers cough and shows other symptoms such as a lower blood oxygen level and the inability to sustain high rates of physical activity. Other people who are at risk are those who work with powdered silica, which has a crystalline chemical structure, which when inhaled over time, will cause the condition silicosis. This dieses is characterized by chronic inflammation of lung tissue, and this inflammation is the body’s immune system attempting to rid the lungs of the silica crystal particles. Asbestos, which has been used for thousands of years, has, in modern times, been deemed illegal to use due to its easy ability to become aerosolized and to cause cellular disruption in the lungs leading to mesothelioma, a type of cancer. Asbestos, when viewed under a microscope, has a very ridged, hard, and irregular structure making it very difficult for the body’s macrophages to digest, leading to inflation.

The body’s immune system has certain receptors, and pathenogenetic crystals, like crystalline toxins produced by bacteria, will bind to these receptors and trigger an inflammatory immune response. This can often make it difficult to discriminate a biological infection from a chemical or immune response.

The body has trouble dealing with the complicated structure and material that crystalline matter has and sometimes its default mechanism of inflammation causes more harm than good.

References

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