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Acidic Stress: The Common Thread Among Disparate Diseases?

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It's an undisputed fact of human metabolism that the body must maintain the proper balance of acidity to alkalinity (pH) in the bloodstream in order to function properly. Any significant deviation from this tightly controlled balance can be life threatening. Fortunately, such events are quite rare.

However, a growing number of physicians and researchers now believe that even very small changes in the acidity of the blood and the internal environment could be the root cause of numerous chronic degenerative diseases.

The normal acid-alkaline balance varies for different bodily tissues and liquids. Stomach acid, for example, can have a pH value anywhere from 1.0 to 3.0, urine from 4.5 to 8.0, skin from 4.5 to 7.0, saliva from 6.0 to 7.4 and pancreatic secretions from 8.0 to 8.3. Human blood has a much narrower range: 7.35 to 7.45. Even slight variations outside this range will compromise organ function.

Acidosis—a state of having elevated acid products in the blood—can be temporary or chronic. Temporary acidosis is

caused by the build-up of waste products such as lactic acid sustained during prolonged aerobic exercise, and is easily corrected in healthy persons.

Chronic metabolic acidosis is a sometimes-fatal disorder in which there is a dangerous amount of acid in the blood. It can be caused by anything from kidney failure and other chronic illnesses to loss of bases due to ileostomy or colostomy. When the pH of the blood dips too low, the body simply shuts down.

Dr. Darko Marjetko, MD, Medical Director of Sanoviv Medical Institute and Health Retreat, points out that while few people suffer from true metabolic acidosis, many people are living in a state of chronic acidic stress, or low-grade acidosis. "When we are speaking about a holistic approach, it's very important to see the small changes inside of so-called normal pH values," Dr. Marjetko told *Holistic Primary Care*.

Dr. Lynda Frassetto, MD, kidney specialist and acid-alkaline researcher, explained to *Holistic Primary Care* that most physiology textbooks don't con-

sider small changes in acid levels to make a difference in health. "But the question is, if you maintain this small difference throughout your entire lifetime, does it have long-term consequences?" she asks. "Not five years or ten years from now, but 60 years or 80 years."

Those little fluctuations may indeed have big impacts on health. Acidic stress could be the common thread among diseases affecting the bones and joints, the nerves, the intestines, and the kidneys.

Causes of Acidic Stress

The acid-alkaline theory of disease is not new. In his book *A New Health Era*, published in 1933, Dr. William Howard Hay maintained that all disease is caused by acid accumulation in the body. While his viewpoint may have overstated the problem, acid-alkaline balance is now witnessing a resurgence in popularity, especially in light of new research that validates its main tenets: first, that factors such as diet, age, lifestyle habits and emotional states contribute to an overly acidic system, and second, that an overly acidic system is a breeding ground for disease.

It's important to make the distinction between acidic foods

and acid-forming foods. While many foods, such as lemons and citrus fruits, are acidic by chemical analysis, they actually have an alkalizing effect on the body. It all depends on the metabolic end products that are created when a food's constituent compounds are disassociated. For example, when citric acid—a strong organic acid found abundantly in citrus fruits—is metabolized, it becomes the strong base citrate, and is further metabolized into bicarbonate, the blood's preferred buffer.

Nearly all fruits and vegetables, with the exception of tomatoes, cranberries and blueberries, are alkalizing. Nearly all proteins, with the exception of milk, butter, soft cheeses and almonds, are acid-forming, as are most fats, cereals and sugars. Coffee, tea, and wine are notorious acid-producers. Look at the typical American's fare in any given day, and you'll see why we are an acidic nation. Dr. Marjetko adds that the intake of drugs, pollution, stimulants, and intoxicants, as well as prolonged emotional stress, also create acidity.

Another causative factor of acidic stress is age. Robert Burns, PhD, Chief Scientific Officer for pH Sciences, a new natural products company specializing

in products designed to restore normal systemic acid-base balance, explains that as we get older, the systems responsible for getting rid of acid don't work as well as they did in youth. The lungs remove less acid in the form of carbon dioxide, the kidneys aren't able to excrete as much acid through the urine, and the skin does not transmit as much acidic perspiration.

"Gradually," Dr. Burns told *Holistic Primary Care*, "as the lungs, kidneys, skin and whole body is slowing down, blood pH starts dropping down." A number of studies confirm that aging promotes acidification (Frassetto L, Sebastian A. *J Gerontol A Biol Sci Med Sci*. 1996; 51(1): B91-B99; Longeran ET. *Geriatrics*. 1988; 43(3): 27-30, 32-33; Nabata T, et al. *Nippon Rinsho*. 1992; 50(9): 2249-2253).

Acidification and Demineralization

Throughout the body, alkaline substances are used to neutralize acids. If this buffer system is used only occasionally, the alkaline elements loaned by the tissues are soon replaced by ones from foods.

The problem occurs when intake of acid-forming foods consistently outweighs intake of alkaline substances. In this case, the tissues—especially the bones—are constantly forced to give up their alkaline minerals, namely calcium and magnesium, in order to buffer the excess acid and keep metabolic processes going.

Could this explain the Western world's osteoporosis conundrum? Even though we eat loads of dairy products and pop millions of calcium pills, we still have some of the highest rates of this bone-debilitating disease in the world.

"When you're too acidic," Dr. Burns told *Holistic Primary Care*, "what's happening is the body is using the bones as a buffer to alkalize the blood. It's

literally dissolving the calcium out of the bones."

Arnett has shown that osteoclasts, cells that resorb bone, are most active when the internal environment is slightly acidic, at a pH of 6.9, and inactive when it is slightly alkaline at pH levels of about 7.3. He concludes that even subtle chronic acidosis could cause appreciable bone loss over time (Arnett T. *Proc Nutr Soc*. 2003; 62(2): 511-520).

Frassetto and colleagues showed that contemporary acid-producing diets produce a low-grade systemic acidosis in otherwise healthy subjects. By neutralizing the net acid load of the subjects' diet with potassium bicarbonate supplements, their calcium-phosphorus balances improved, and their bone resorption rates were reduced (Frassetto et al. *Eur J Nutr*. 2001; 40(5): 200-213). Adding to the evidence, hip fracture incidence is highest in countries with a low plant-to-animal food intake ratio, and lowest in those with a high one (Abelow et al. *Calcif Tissue Int*. 1992; 50(1): 14-18).

In a review article, Wiederkehr and Krapf assert there is experimental evidence to indicate that even mild degrees of acidosis, such as those induced by eating a high-animal-protein diet, induce multiple metabolic and endocrine alterations, and encourage the development of kidney stones (Wiederkehr M, Krapf R. *Swiss Med Wkly*. 2001; 131(9-10): 127-132).

Acid-alkaline research is still in its infancy. However, since rheumatism, sciatica and dental carries are all characterized by mineral loss, these conditions may also be caused by acidic stress.

Acidic Stress and Other Diseases

Because acid is corrosive by nature, it is also theorized to create inflammation and lesions or

hardening of the tissues. This leads many practitioners to believe that interstitial cystitis, urethritis, arthritis, neuritis, enteritis and colitis are all the result of acid accumulation in the tissues.

Bobkov and colleagues investigated the relationship between the pH of joint fluid in patients with rheumatoid arthritis and the severity of joint inflammation. The researchers found an inverse correlation: the lower the pH of the joint fluid (i.e. the more acidic), the more pronounced the arthritic inflammation (Bobkov, et al. *Ter Arkh*. 1999; 71(5): 20-22).

One animal study looked at the acid-base equilibrium of calves with enteritis. Calves afflicted with the disease had blood pH values significantly lower than those of normal calves, indicating that acidosis may be a causative factor in the development of bowel inflammation (Angelov G, Abdelmalek B. *Vet Med Nauki*. 1987; 24(1): 44-48).

Even cancer may be related to acidic stress, however this view is purely speculative. "You're in an acid condition when you have cancer," Dr. Burns explained to *Holistic Primary Care*. "Did the acid cause the cancer or did the cancer cause the acid: that's the question. It (acidosis) certainly makes cancer more easily propagatable."

Solutions to Acidic Stress

The most efficient way to combat acidic stress is through dietary changes, though some patients may not have an easy time giving up their coffee, alcohol and red meat. Most natural medicine practitioners recommend a diet comprised of 60-80% alkalizing foods and 40-20% acid-forming foods. Just by making dietary changes, a person should see a significant reduction in his or her urinary acidity within 30 days.

Dr. Marjetko says that while there are some recommendations that humans should eat only one quarter acid-producing foods, "I would be very happy if I could see that most of the population was taking in two thirds of the alkaline and one third of the acid-forming."

Dietary supplements of alkaline minerals, such as calcium, magnesium and potassium carbonates and hydroxides, can also help to combat low-grade acidosis. However, according to Dr. Burns, simple carbonate forms of the minerals are not alkaline enough to be effective on most organic acids, only on inorganic ones. His company manufactures a number of products that feature a patented combination of potassium hydroxide, magnesium hydroxide and calcium carbonate designed to buffer both organic and inorganic acids. So far, no clinical trials on pH Sciences' products have been completed, however two unpublished pre-clinical studies found that subjects taking the supplements for five days experienced on average a 53% reduction in urinary acid.

The pH Sciences website (www.phsciences.com) contains a number of review articles on the clinical relevance of acidosis and diet/supplementation interventions that can restore normal acid-alkaline balance, as well as a listing of physicians who are focused on this issue. Company spokesman David Matteson told *Holistic Primary Care*, that the company is seeking research grants that would enable it to fund clinical trials on the role of alkalizing therapies in the management of cystitis. The company is also working with Joseph Pizzorno, ND, founder of Bastyr University, to design trials to elucidate the precise mechanisms by which low-grade acidosis contributes to various disease states and the ways in which the condition is best treated. ☺