

Anachronistic Inflammatory Reaction

Infectious disease was the cause of death for most of our ancestors. Infectious diseases are mostly caused by small microscopic organisms and include bacteria, viruses, fungi, mold, yeast and some other organisms. Just as all animals are not dangerous and some are even helpful, many microorganisms are necessary for human life but some are deadly. Prior to immunizations and antibiotics many children died from infectious diseases. Women frequently died from infections subsequent to childbirth. And men who died in wars died not from their wounds but from the infections that the wounds caused. More than 95% of people died from infectious related diseases before they turned 40. To protect us from these infections our bodies developed a powerful quick and prolonged inflammatory reaction to injury. The primary purpose of this inflammatory reaction is to kill potential biological invaders before they can produce an infection that could kill us.

Any slight injury to the body produces the risk of infection. Diphtheria, plague, gangrene, and numerous other infectious agents were and are around us all the time. They are more numerous than insects. Our bodies counter this risk by immediately releasing enzymes that dissolve everything in the area of injury whether it is foreign material or your own body. Our body as a part of these inflammatory reactions releases acids that dissolve or kill anything they come in contact with. This reaction destroys foreign organisms as well as our own cells, and attracts our protective cells to the site of injury. These cells consume or destroy everything they come in contact with. These acids and enzymes are also then distributed throughout our bodies in lower concentration where they may produce more subtle damage.

The inflammatory reaction is so quick and harmful that sports medicine doctors have athletes iced as soon as possible after an injury. This icing starts before the player even leaves the field of play or removes their uniform. The speed of action of enzymes and chemical reactions are temperature sensitive. Lowering the temperature of the injured body part decreases the extent of the damage by slowing the inflammatory reaction. A significant portion of the subsequent total injury to our body is from our body's own inflammatory reaction to the injury itself. This inflammation *increases* the extent of the injury, slows healing and prolongs the time it takes for the athlete to resume playing.

Since immunizations and antibiotics have become available many people have started to live into their 90s and the majority live to their 70s. Diseases such as arthritis, Alzheimer's disease, and other degenerative illnesses have become common when they were much less prevalent in the past. A part of aging is built into our genes but a significant part relates to "wearing out" as a result of chronic traumas enhanced by our bodies own inflammatory response to these traumas. Sun makes skin wrinkle, stresses to joints induce inflammatory responses that dissolve cartilage and injuries to our spines gradually increase over time. Chemicals in our bodies called free radicals break healthy proteins and causes inflammation that results in identifiable damage. These small injuries accumulate over time until the body part affected becomes diseased. Most commonly these body parts are the joints, brain, skin, lungs, and circulatory system.

Anti-inflammatory medications can blunt this historically produced inflammation that with the presence of immunizations and antibiotics is now anachronistic. The problem of anti-inflammatory medications is their side effects. Steroids are used at times for severe inflammatory responses such as life threaten asthmatic reactions, allergic reactions that threaten life, and severe illnesses the otherwise would progress such as lupus. But steroids may cause other serious problems themselves that are too numerous to list here. Steroids are clearly necessary in some conditions but their use must be judiciously weighed against the risks and the benefits on a regular basis.

Aspirin was the first medicine discovered that has anti-inflammatory properties in high doses. Aspirin was the first member of a class of medications known as non-steroidal anti-inflammatories or NSAIDs. NSAIDs have been used for over 50 years to manage numerous chronic inflammatory conditions.

NSAIDs have side effects that need to be observed for but on the whole the benefits far out weigh the risks for the majority of people. There are some people who should never take an NSAID and some of the conditions are listed on package inserts. NSAIDs need to be taken thoughtfully. They can cause minor side effects such as rashes, stomach upset, diarrhea, nausea, depression, anxiety, and shortness of breath in some people. Although these reactions are infrequent, considering the numbers of people who take these medications they need to be observed for. If a person has *any* new symptom that does not resolve while they are on an NSAID the NSAID should be removed, observe for the symptom to resolve and try a different NSAID. If the initial NSAID was particularly effective a re-challenge with that agent is usually possible.

For the rest of us who do not have a clear contra-indication I am an advocate of taking *daily* doses of NSAIDs *at anti-inflammatory levels*. NSAIDs have many effects including reducing fever, relieving pain, increasing the tendency to bleed and reducing inflammation. The anti-inflammatory dose is usually much higher than the dose for fever or pain relief. If NSAIDs are taken in a dose that relieves pain but does not reduce inflammation there is a significant risk of actually *increasing* a chronic injury and causing more problems. Pain reminds us not to do something that is harmful to us. If we blindly mask pain we risk harming the part of our body that is injured by engaging in activities that we would otherwise avoid. Thus if you decided to take an NSAID for a chronic condition or to prevent a chronic condition be thoughtful about not engaging in activities that you would otherwise avoid. Listen to your body!

The anti-inflammatory dose of ibuprofen (Mortin) which is one of the most commonly taken over the counter NSAIDs is 800 mg three time per day. This is a very high dose and most people take a lower dose because at a lower dose it relieves pain. Gradually increase an NSAID to the anti-inflammatory dose. This allows your body to adjust to it and helps prevent side effects. Once you are on the proper dose take it *everyday*. Our bodies thrive on habit. Pulsing NSAIDs by taking them intermittently will make you more vulnerable to side effects. To determine the anti-inflammatory dose look it up for each medication. Facts and Comparisons is an excellent medication book available in some libraries. It has tables of NSAIDs and the corresponding doses. There are prescription NSAIDs that achieve anti-inflammatory effect when taken only once a day. Some primary care physicians are willing to prescribe them.

A frequent side effect of NSAIDs that indicates toxicity is ringing in the ears in a quiet room. If you have a side effect, lower the dose to where the side effect just goes away. If you are slightly below the therapeutic anti-inflammatory dose you are probably still taking an anti-inflammatory dose for you. If you are at less than half the recommended dose, try a different NSAID.

Many primary care physicians will not prescribe long term NSAIDs primarily due to a risk of stomach bleeding. Prior to the discovery of medications that lower stomach acid that are called H2 blockers, bleeding stomach ulcers were common. Tagamet and Pepcid are examples of H2 blockers. Since H2 blockers were discovered *bleeding* ulcers have become uncommon. Bleeding ulcers frequently caused the death of people. While ulcers are still common they infrequently progress to problem bleeding now due to the action of H2 blockers and/or antibiotics that treat ulcers. Since NSAIDs prolong bleeding time and were available prior to H2 blockers NSAIDs precipitated bleeding ulcers in many people. Since bleeding ulcers are now extremely uncommon except in people who have other serious debilitating illnesses such as cancers, chemotherapy or severe malnourishment or are not taking their H2 blocker it is quite safe for the majority of us to take therapeutic doses of NSAIDs continuously. However it is important to discuss with your primary care physician if NSAIDs are absolutely contraindicated in your particular medical profile. An example of an illness where NSAIDs are absolutely contra-indicated is hemophilia.

In addition to NSAIDs, anti-oxidants will decrease your risk of numerous other chronic problems. The most widely taken anti-oxidants are vitamins C and E. Anti-oxidants inactivate free radicals mentioned above and also help to abbreviate an inflammatory reaction by promoting healing. There are no good studies that definitively indicate what dose of anti-oxidants are helpful. I recommend a moderate to low dose of 500 mg of Vitamin C twice per day and 400 to 800 IU of Vitamin E once a day. Some writers recommend very high doses of Vitamin C. Vitamin E may be taken daily because your body generally does not excrete it. Vitamin C is excreted and the blood level drops about 4- 6 hours after an oral dose. In addition to these everyone should take a Multivitamin with minerals everyday. Morbidity (illness) and mortality (death) are lower in people who take a daily vitamin. While it is true that a "Balanced diet" provides us all the vitamins we need, it is not easy to eat a perfectly balanced diet *everyday*. A vitamin per day is easier for most of us who hit a fast food place for convenience perhaps more often than we should. For those of you with a queasy reaction to vitamins, taking them in the middle of a meal when there is already food in your stomach and some food to follow too may make them more tolerable. If you still cannot tolerate it, try a different brand.

No matter what approach you take, start it slowly, and remain on it faithfully. It shocks the body to make any change abruptly if it is otherwise avoidable. You can have withdrawal from vitamins (and possibly NSAIDs) if they are stopped suddenly like skipping them for two to three days because you forget to take them. Our bodies do become more "lazy" at absorbing vitamins when they are abundantly present. If there is a medical need to stop a vitamin it is better to taper it if possible by going every other day, twice per week, weekly, monthly and then stopping it than it is to abruptly stop.

Properly used there is solid scientifically based data that NSAIDs and vitamins may decrease long term morbidity and mortality for the majority of us. Improperly used they can kill us.

© 2002 James H Thomas MD