

Acupuncture and Inflammation: A Healthy Alternative to Cortisone

November,
2010

Acupuncture to Lower Inflammation

Cortisone: The “other” big C. It is a common household word. Nearly all of us have been treated or know someone who has been treated with corticosteroids for some form of inflammation or inflammatory disease. It is given in one of four forms:

- 1) **Oral:** Pill, tablet, or syrup. It is often taken in this form for chronic or systemic problems including Rheumatoid Arthritis and Lupus. Example = Prednisone
- 2) **Topical:** Creams and ointments are applied to the skin to treat allergic reactions and surface conditions to relieve itching and irritation. They can greatly range in potency. Example = Hydrocortisone
- 3) **Inhaler or Intranasal Spray:** This form is used to treat asthma and allergic reactions that affect the lungs. Example = budesonide (Pulmicort)
- 4) **Injection:** Injecting directly into a joint to reduce inflammation such as tendinitis. This is a very common technique to treat knee, shoulder, neck, and back-pain. Example = Celestone

What is Cortisone?

Cortisone falls under the family of chemicals known as corticosteroids. In its natural form (cortisol), it is produced by the adrenal glands located on top of the kidneys. Cortisol is released in higher amounts in times of stress as part of our “fight-or-flight” response.

In the short-term, its benefits were designed to increase our chance of survival in case of a life-threatening attack. Chronic high-stress situations, however, produce high levels of cortisol over extended periods of time that can have harmful side-effects; one of which is lowering the immune and inflammatory response.^{1,2} Doctors have discovered that controlled dosages of corticosteroids can suppress inflammation and consequently relieve symptoms associated with pain due to inflammation. The idea is that if

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inflammation can be reduced, pain can be controlled, proper blood flow can be restored, and healing can flourish. This has become so popular a treatment method that nearly all of us has been treated with corticosteroids in one form another. So, what's the problem? Why do some doctors limit the number of treatments? Before we discuss the health-risks of cortisone or similar products, let's explore the concept of inflammation.

What is Inflammation?

Inflammation, or the “inflammatory response” is a natural reaction to trauma or injury. It is an integral part of the immune response that takes place to heal wounds and fight infection and disease. It's also involved, however, in a large variety of problems ranging from mosquito bites to asthma to auto-immune diseases like Rheumatoid Arthritis. So, it's a double-edged sword. On one hand, it is critical in wound healing, but un-regulated or “out-of-control” inflammation can contribute to serious health problems including cancer, heart disease, asthma, and auto-immune diseases.

The inflammatory response is part of a complex process involving the release of several types of white blood cells, macrophages, and associated chemicals to both heal damaged tissue and fight off foreign invaders ^{3,4}. For purposes of this article however, we will ONLY discuss inflammation as part of the wound-healing process resulting from injury.

The normal cycle of healing involves three phases: I-inflammation phase, II-Proliferative Phase, and III-Remodeling Phase. Unfortunately, the process can sometimes get stuck in the Inflammation Phase, especially in sports injuries.

When cells are damaged, they trigger the release of chemicals that increase permeability of the blood vessels near the damaged site and initially cause various types of macrophages and white blood cells (leukocytes) to leave the blood vessels and enter the intra-cellular tissue around the damaged area to both fight off foreign invaders, consume cellular debris, and trigger additional steps of the healing response. Messengers that act as communication between these different leukocytes and mast cells are a group of proteins called Interleukins. These messengers are responsible for controlling cellular differentiation and proliferation, inflammation, and histamine release⁴. Some of these interleukins are considered “pro-inflammatory” while others are considered “anti-inflammatory”. Ultimately, The large number of interleukins (at least 35 types) highlight the vast complexity of the immune system ^{5,6,7}.

So how can this inflammatory response cause problems in healing and lead to joint pain? As we've already mentioned, the immune response triggers capillaries to become more “leaky” and result in a profusion of neutrophils and platelets into the tissue outside the blood vessels. As this process continues, both vasoconstrictive signals from the leukocytes and simple pressure can dramatically compress tissue and surrounding nerves, and restrict local blood flow; blood flow that is critical for the additional tissue repair process.

Now, we can talk about cortisone treatments in a more educated light. As we mentioned, corticosteroids can suppress the immune response and thus decrease inflammation and associated inflammatory pain. It is thought that it prevents neutrophils and monocytes (types of leukocytes) from populating the inflammatory area⁸. It also lowers the concentration lymphocytes, monocytes, and eosinophils; all subtypes of white blood cells that are critical in the immune and inflammatory response⁹.

By inhibiting access of these immune cells and associated proteins to the injury site, inflammation is blocked, pain is reduced, and healing can continue. On the surface, this sounds like a great idea with several years of apparent success in the use of corticosteroids to treat inflammation and joint pain. Millions of americans have been prescribed steroids to “help” with their pain and discomfort. It has become such a common treatment that few patients even question the health risks of cortisone shots, nor do physicians discuss the full list of side-effects caused by steroids.

As we’ve already mentioned corticosteroids are the byproduct of the Stress Response. While increasing the chance of survival from an immediate threat, it has a negative impact on our health during prolonged stress states².

These side-effects are present regardless whether it’s taken in oral form for systemic inflammation or injected at a very small amount to a local area. As the history and understanding of cortisone grow, so do the list of negative side-effects. While cortisone in it’s many forms has several negative side-effects throughout the body¹⁴, we will focus primarily on cortisone shots for treating joint pain and inflammation. A brief summary of the side-effects of cortisone shots are shown below: (as listed on the Mayo Clinic Website: Cortisone Shot Risks¹⁰)

- Death of nearby bone (osteonecrosis)
- Joint infection
- Nerve damage
- Skin thinning around injection site
- Temporary flare of pain and inflammation in the joint
- Tendon weakening or rupture
- Thinning of nearby bone (osteoporosis)
- Whitening or lightening of the skin around injection site

What is exactly happening at the injection site?

Cortisone inhibits chondrocyte production and the proteins, collagen and proteoglycans that are the building blocks for cartilage and joint repair. This means that cortisone injections actually PREVENT cartilage and joint repair. It is also found to weaken ligaments and tendons surrounding the injection site. A decrease in angiogenesis (new blood vessel formation) in the injection area has also been noted¹¹.

A study on cortisone injections in horses revealed that after only ONE cortisone injection, researchers noted chondrocyte necrosis (death of cells designed to repair

cartilage), a dramatic decrease in the number of new chondrocytes, and a decrease in proteoglycan content and synthesis. This damage to the joint was still present 16 weeks after the single injection¹².

What about cortisone for athletes? I often see patients who have received care and cortisone shots from one of the official doctors of the professional sports teams. These doctors are supposed to be the experts on fixing athletes...right? If their treatment and medical care is good enough for professional athletes, it's good enough for my patients! The problem with this assumption is that many (but not all, of course) sports physicians are concerned with short-term results only. Their goal is to get the athlete back on the field as quickly as possible. While the athlete may not feel pain for a few weeks or months following cortisone injections, the long-term effects are devastating.

Can exercise help? A study at the Washington University School of Medicine in St. Louis Missouri in 1993 studied the combined effect of cortisone injections AND exercise on joint cartilage. They examined 3 groups of test subjects:

Group 1 - Control Group. Received NO cortisone injections.

Group 2 - Received cortisone injections and and no exercise.

Group 3 - Received cortisone injections with exercise

The results showed that all test subjects who received cortisone injections showed cartilage damage and a decrease in the number of chondrocytes (cells designed to make new cartilage) compared to the control group who received no cortisone. Astoundingly, the group that received cortisone and exercise showed much greater cartilage damage compared the group that received cortisone damage but no exercise. Group 3 also showed a marked decrease in the production of glycosaminoglycan: the substance that gives cartilage it's "bounce"¹³.

So, is giving cortisone shots to anyone, whether they are an athlete or not a good idea? For those of you who have had cortisone shots for joint pain, was ANY of this information discussed with you?

What are your options? There are several treatment options that both can both help reduce inflammation AND improve joint healing. To help reduce systemic inflammation resulting from a wide variety of diseases, treatment modalities including dietary changes and homeopathy are possible solutions. For more local joint inflammation both cold-laser therapy and prolotherapy are effective. Rather than suppressing the immune system, these treatment modalities mediate some of the pro-inflammatory processes yet still encourage and accelerate a healthy immune response.

What About Acupuncture?

Acupuncture and TCM (Traditional Chinese Medicine) is a comprehensive system of medicine that can be used to treat both systemic (body-wide) inflammation including

allergic responses ranging from asthma, edema, sinusitis, and colitis, to more local joint based inflammation such as tendonitis.

In TCM, we don't see "inflammation" as a distinct disease. Instead, we examine how the flow of Qi, blood, and water can become blocked. Normally, these substances flow along the meridians, blood vessels and through the internal organs. Their role is to nourish the limbs, joints and internal organs to ensure proper day-to-day function. When their flow is interrupted, health problems occur. While we acknowledge the local swelling at a given joint as blood or Qi stagnation and possible dampness, TCM also considers the underlying conditions that may have led to the joint damage in the first place. For example, professional and extreme athletes who undergo prolonged periods of training tend to experience Qi and Blood deficiencies in the Spleen and Liver/Gallbladder. Eventually, the immune system can also be depleted as characterized by a deficiency of Wei Qi¹⁴. A typical treatment protocol would be to nourish Qi and blood at the organ level while resolving stagnation at the local area of inflammation. Along with acupuncture needles, a TCM practitioner would use cupping (for stagnation), moxabustion (to dispel cold and to tonify), and even bleeding (to move or cool blood and decrease swelling). Herbs and poultices also play a very big role in treatment, but for now, we will just be focusing on acupuncture-type treatments. On the surface these tools may seem primitive and even a little barbaric, but they are indeed effective with little to no health risks.

Does Acupuncture Really Lower Swelling? The Proof is in the Blood

Aside from testimony from patients and anecdotal evidence, how can we prove that acupuncture does control inflammation? As we've already discussed, the immune response and inflammation is a complex multi-level process. It relies heavily on chemical messengers called cytokines that help control things like blood vessel permeability (leakiness) and vasoconstriction/dilation at the injury site. Some of these cytokines promote inflammation such as interleukin IL-6 while others help decrease inflammation such as IL-10. Several studies reveal that both manual and electro-acupuncture can have a dramatic effect on both leukocytes (white blood cells) and their associated cytokines. Specifically, acupuncture was shown to decrease IL-6 and increase IL-10^{16,17}

In one study, acupuncture at the point *sanyinjiao* (Spleen 6) was shown to decrease inflammation induced by carrageenan injections¹⁶. As we've mentioned before, inflammation is due in large part to increased blood vessel permeability. Neutrophils (a type of white blood cell) and other materials slip through the cell walls and migrate to the injury site. This study directly measured levels of cytokines and determined the level of capillary permeability. The results showed that acupuncture at Spleen 6 resulted in a dramatic decrease in blood vessel permeability and a significant decrease in inflammation. Blood analysis showed a large increase in the anti-inflammatory cytokine Interleukin IL-10 in comparison to the non-acupuncture group.

What About Acupuncture Compared to Steroids?

In this same study, some of the test subjects with the carrageenan induced inflammation were injected with dexamethasone (DEXA), a powerful synthetic steroidal anti-inflammatory. Much like the acupuncture group, the blood-vessel permeability and inflammation was significantly reduced. Interestingly, DEXA did not affect IL-10 levels. Instead, DEXA decreased levels of pro-inflammatory cytokines (IL-1beta and TNF-alpha). IL-1beta is a pro-inflammatory cytokine while TNF-alpha is both a pro-inflammatory and helps prevent tumor growth and viral replication. Subjects treated with the acupuncture at Spleen-6 showed NO changes in these pro-inflammatory cytokines¹⁶ but did cause an increase in anti-inflammatory IL-10. These revealing results show how different mechanisms are used to control inflammation between acupuncture and steroid treatments. It's also a fascinating lesson showing how acupuncture can be an anti-inflammatory but NOT be an immunosuppressant!

Another study highlighted the benefit of electro-acupuncture over regular acupuncture to treat inflammation. An acupuncture needle was inserted at *Zu San Li* (Stomach-36). Electrodes were connected to the acupuncture needle and a simple conduction pad at point Stomach-41. Treatment was done at 3 times per week for several weeks. Blood tests revealed that electro-acupuncture was more effective than manual acupuncture in reducing pro-inflammatory cytokines IL-6, IFN-gamma, and TNF-alpha within test subjects that have collagen-induced arthritis and inflammation¹⁷.

While these studies were relatively simple and use standardized single-point protocols, they clearly show that acupuncture does in fact have a powerful effect on inflammation.

Blood analysis is one thing, what about real-world injuries?

As we've mentioned before, inflammation can play a role in a wide range of diseases. An article summarizing acupuncture studies for the treatment of asthma, rhinitis (stuffy nose), inflammatory bowel disease, and rheumatoid arthritis showed mixed results. Some studies showed clear signs of improvement using acupuncture while other studies suggested no significant improvement with acupuncture¹⁸.

An article in the journal of Medical Acupuncture reviewed several studies on the effectiveness of acupuncture for sports injuries; scenarios that would often leave the patient looking at cortisone injections as a solution. Conditions including osteoarthritis, patellar tendonitis, plantar fasciitis, and frozen shoulder were examined. The results were encouraging in that most of these conditions showed positive results with acupuncture treatments¹⁹. In other words, acupuncture was successful in decreasing pain and increasing functionality in its test subjects. A few of the studies suggested, however, that acupuncture didn't appear to help.

While this may seem confusing at first, it simply reveals the difficulty in conducting high-level quality studies with acupuncture on people. Why is this? Unlike animal studies, it's difficult to have complete control of all variables involved in human test subjects. Factors including diet, lifestyle, history of old injuries, and day-to-day stressors all play a

strong role in our over-all health, well-being, and rate of healing. As we've discussed through this and previous articles, the mechanisms of acupuncture work by "encouraging" or accelerating the body towards healing while having a "moderating" effect on body systems that appear to be out-of-control. In contrast, most conventional treatments use drugs that work by either killing or blocking a chemical response and suppressing a natural body process; often with serious health-risks and negative side-effects. In short-term testing, this later method is much easier to prove with repeatable results.

Our immune system is both a complex and ingenious method to keep us healthy in a hostile world full of foreign invaders and physical trauma. For the most part, it works. Sometimes, however, our immune system can "get in it's own way", get out of control, and lead to problems such as inflammatory diseases, allergies, and inflammatory joint pain. Fortunately, we have several tools including acupuncture and natural medicine that can reduce the inflammation without compromising our immune system²⁰. Before you take the next round of corticosteroids for your allergies, skin condition, or joint pain, ask your physician for a complete list of side-effects and health risks. Natural medicine and acupuncture could be a better choice. They have little to no side-effects and are proven to work.

Author's Note: After reading this article, it's tempting to think we are bashing conventional Western medicine and saying that conventional medical doctors care little about the health of their patients. This is not true. For the most part, doctors are sincerely interested in getting their patients better. The challenge is that conventional doctors have access to a very limited number of tools. They are both unaware and untrained in the use of Traditional Chinese or Natural Medicine. So, they do the best with the tools they are given. There is a time and place for all forms of medicine. The key is to find the best tool for the job. It's the responsibility of both the patient and the health care provider to investigate all possible solutions and discuss in detail both the benefits AND the risks.

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