Concord Orthopaedics, P.A.

PART III: WHAT IS CORTISONE?

What is Cortisone?
Cortisone is a naturally occurring substance (hormone) in the body which serves to control energy levels. It does this by regulating the release of sugar from fats and other body storage sites into our bodies. Cortisone levels vary in the body depending on the time of day and the stresses we face. When our stress levels go up, so do cortisone levels. Cortisone levels peak in the morning and decrease as the day goes on.

Cortisone is a "steroid" hormone, of which there are literally hundreds. They can be generalized into three types:

- ***Androgens*** are sex hormones, such as estrogen and testosterone. While these substances can have legitimate purposes, androgens are the substances illegally used by body builders to create bigger muscles. Cortisone does not have this effect.
- ***Mineralocorticoids*** are steroids which regulate salt/water balance in the body. Cortisone has a weak mineralocorticoid effect, and this accounts for the fluid retention which may occur.
- ***Glucocorticoids*** are steroids such as cortisone which affect blood sugar metabolism. There are dozens of different glucocortioids, with varying potencies.

We also know that cortisone is an ***immune suppressant.*** We know that the immune system plays an important role in creating sensitized pain states, and that treatments, such as cortisone, which suppress immune function can serve to alleviate pain.

How does cortisone affect pain?
Cortisone affects pain in different ways depending on how it is given. In general, cortisone is given by mouth or by local injection. When given orally, cortisone acts more centrally at the brain and spinal level. While we assume it inhibits immune cell function and the release of algogenic substances, we are not really sure how it does this. We are also not sure if orally given cortisone has any direct effect on the area where the injury has occurred.

When cortisone is given by local injection, it works in two ways. First, it directly suppresses the local release of algogenic substances. Second, it acts directly on the c-fiber (pain nerve) to increase its threshold. By decreasing the c-fiber input on the dorsal horn, it is thought cortisone, when given in this manner, serves to also lower central sensitization, thus serving to suppress the vicious pain cycle. Unfortunately, a sensitized pain state becomes a true neural behavior. The longer it lasts, the more ingrained it becomes, the more difficult it is to reverse. We recognize that when we wish to change a behavior, whether it is a bad batting swing or an addiction, we need to repetitively address the misbehavior with a desired behavior. That is the basis for "training." Changing a nociceptive behavior is no different, and that is why it requires a series of injections to get the desired result. It is important to note that the first exposure may not create a perceptible change in pain. Patients who show little response to the first injection often still do well. Some patients, who show little response to two, still do well, although it is my observation that in such a circumstance, the odds of success drop considerably.

[Over]

What is cortisone? (continued)

What are the problems with cortisone?

Cortisone can, in certain circumstances, be a wonder drug. However, like any other medical intervention, it has its problems, and these problems limit how much exposure an individual may have to it. Also, each person reacts differently to cortisone, and this may affect how well an individual may tolerate it. Most of cortisoneôs side effects are predictable based on our knowledge of how it works.

- Cortisone increases blood sugar by breaking down bone, fat, muscle, and other soft tissues. With long term exposure, it can cause parts of the body to deteriorate, and it can cause a central obesity. Fortunately, with short term or intermittent exposure, this does not happen. That is why we limit the number of injections an individual may get in a year. We donôt really know what the ñmagicònumber is, and it probably varies from person to person. Currently, for spinal injection, we recommend no more than 3 ï 5 injections to any part of the body within a year. We like to tend towards three, but if an individual is showing progressive improvement with each injection, and has not reached a plateau after 3, we may continue. It is recognized that all medical decisions are based on a cost/benefit basis. In some individuals with severe and incapacitating pain who respond for several weeks to months to cortisone injection, the risk of corticosteroid overexposure is outweighed by the risks of inactivity and suffering. In such circumstances, we will exceed the recommended exposure, but only after careful consideration.
- Cortisone has a central energizing effect. For many, this is pleasant. For others, substantial anxiety may occur. This effect abates promptly after discontinuation. Related, cortisone increases metabolism, which can result in low grade temperature increases. Low grade fevers which occur within 24 hours of exposure are most often due to this effect, and not due to infection.
- Cortisone seems to have a weak estrogen like effect. In post-menopausal women this may result in a ñhot flashòwhich may last for several days. The likelihood of this effect is dependent on the potency of the cortisone. It seems to respond to aspirin.
- Cortisone has a weak mineralocorticoid effect. It can cause fluid and salt retention, and it can cause ***temporary*** increases in blood pressure.
- Cortisone antagonizes insulin. As a result, it can cause increases in blood sugar. This is typically only seen in insulin dependent diabetics. Cortisone, in limited exposure, does not cause diabetes, and the effect wears off when the cortisone is no longer present.
- Administration of cortisone inhibits the bodyôs own production of the hormone. For short courses, this is not a problem. When given continuously over several months, sudden withdrawal of cortisone can be a medical emergency. That is why doses are tapered off when given orally. This is rarely a problem with injectable corticosteroids.
- A rare problem called avascular necrosis of the hip may occur with high dosing of cortisone. We only use doses which have not been associated with this side effect.

These side effects are much more common with high potency corticosteroids given orally. That is why we use low potency corticosteroids, in limited doses, and with limited exposures. As a result, it has been my experience, that these side effects are quite rare in our patients.