

Do NSAIDs negatively impact the healing process?

When we see a client who is in obvious discomfort with an acute injury, it is common practice to attempt to control those symptoms. This gives the client quick relief of the inflammatory symptoms, but at what cost? There is no doubt that NSAID medications control the symptoms associated with the 2 early phases of healing; inflammation and proliferation. They do so by inhibition of inflammatory chemicals. There are many studies supporting their benefit for pain and function but what is the effect on the actual quality of the repair? The concern is that these chemicals are a necessary part of a healing process that has developed over millions of years.

“Inflammation is a normal and necessary pre-requisite to healing (Hardy 1989)”



Healing follows these basic steps:

Inflammatory Phase (about 3-5 days): A response to tissue injury. Viewed as a cascading chemical event, where each step leads into the next. The cardinal signs are: Calor(heat), Rubor(redness), Tumor(swelling), Dolor(pain), Functiolasea(loss of function).

Proliferative Phase (to day 21): Fibroplasia and Angiogenesis are the 2 fundamental processes that occur. Fibroplasia is the proliferation of fibroblasts that produce new collagen. Angiogenesis is the mitosis of the capillary cells producing blood supply to the new collagen.

Remodeling Phase (day 21 to >1year): Macrophage, fibroblast, capillary and water concentrations all reduce and sensitivity decreases. The collagen fibers reorganize into directions of tensile stress.

Tendon: Dimmen et al. 2009 showed a decrease in transverse and sagittal diameters of the tendons of rats that were giving parecoxib or indomethacin during the first 7 days post injury.

Tendon to bone junction: Dimmen et al. 2009 found significantly lower maximum pull out strength and stiffness on tendon re-attachments at the 14-day post-op for rats given parecoxib or indomethacin. Ferry et al. 2007 also found decreased maximum load on tendons subjected to celecoxib, valdecoxib, piroxicam vs. control. Tendon strength was also higher in the acetaminophen and ibuprofen groups than the celecoxib group.

Bone healing: Dimmen et al 2009 treated rats with parecoxib, indomethacin post fracture. The results showed a negative effect on bone mineralization during the early phase of fracture healing. The statistical power of this study was too low to show differences at 6 weeks.

Clinical Conclusions: Remember that most solid evidence is in animal studies, human studies have not been done in this nature. The stages of healing are similar. If a client's pain is tolerable, they may wish to avoid the introduction of NSAIDs to ensure the best possible repair quality. If they are unable to function or sleep due to the symptoms of an inflammatory response, then acetaminophen or ibuprofen may be the best choice until the end of the proliferative phase of healing.

Reference:

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