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CORR Insights®: Does Advanced Cryotherapy Reduce Pain and Narcotic Consumption After Knee Arthroplasty?

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Where Are We Now?

Ice is known to reduce pain and reduce swelling after an injury. Because of this, most of us feel that cryotherapy after TKA is helpful. But the evidence supporting this approach is scarce [1, 2, 6]. This may

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be the result of inconsistencies in how the ice or cooling device is applied. Improving our techniques of application may make it possible to improve the efficacy of cooling after surgery. Manufacturers have agreed, as more alternatives were developed like soft packs or cuffs that use running ice water. In this study, a highly sophisticated electronic device was tested against traditional, easy, and cheap cool packs. This randomized controlled trial found no difference in pain control, narcotic consumption, or postoperative function, regardless of how we apply the cold – high-tech or old-school, the results do not seem any different.

Where Do We Need To Go?

But perhaps that is too simple a conclusion. After comparing the means and standard deviations, the data

indicates only a small difference for the mean (0.5), while standard deviations are actually high (2.5). A posthoc power calculation showed that the sample size should be 363 patients in both groups in order to conclude a lack of difference with confidence; in this study, the total sample size was 116 patients. The variance in pain perception is large and explains the high standard deviation. Anxiety, chronicity, illness perception, or osteoarthritis of other major joints [5] are factors that will likely have a greater influence on postop pain intensity compared with cryotherapy. Therefore, we are looking for a small effect in a group with a large multifactorial variance. If we want to increase the small effect cryotherapy, we need a better understanding of the physiological effects of cooling. We know that cooling reduces tissue metabolism, vasoconstriction, and sensory nerve function. However, we must also accept that intraarticular temperature reduction is small and only a short-term solution [4]. In animal experiments [3], it appeared that excessively low temperatures or too long application of cooling systems

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may increase local edema. The local effects of temperature variance and different ways of application are unknown. We have to work out these experimental and clinical data to create a scientific based clinical directive for cryotherapy.

How Do We Get There?

Before adopting new and expensive cooling systems, we must have a better understanding of the physiology of cooling and its effects on wound healing. Once we know the correct temperature, and once we can apply it with a device that can get the joint safely to that temperature, we can design new randomized controlled tri-

als with adequate power. Perhaps with this approach, we can discover whether advanced cryotherapy after TKA offers a practical approach to reducing pain or simply functions – as the data of Thienpoint et al. seem to suggest – as an expensive placebo.

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