

Evaluation of Cold Therapy in Postoperative Spine Patients

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The use of cold therapy postoperatively in orthopaedics has been the topic of a long-standing discussion. How cold is applied, (i.e., ice vs. machine), the length of time of cold exposure, and frequency of application has been the subject of debate for years, and there is still no clear-cut answer or standard which is uniformly followed. The use of cold has been shown by both Cohn¹ and McCoy² to decrease the need for pain medication postoperatively. Masten³ used cold therapy in the laboratory to demonstrate that post-traumatic swelling was controlled with cold applications. McMaster and Liddle⁴ showed a relationship with decreased edema and early application of ice. We attempted to look at the application of cold therapy in postoperative spine patients to see if there was significant benefit to our patients. In our study patients were randomly chosen to receive cold therapy postoperatively. Patient groups were normalized as to sex, age, and surgery. Both groups were homogenous when looked at overall. The Hot/Ice System™ (Incare Medical Products, Hollister Inc., Hollister, Calif.) was chosen as the method of cold delivery for three reasons: (1) ease of use, (2) limited need for nursing intervention, and (3) delivery of consistent cold temperatures (Fig. 1).

Patients averaged 10.5 hours of use of the cold pads per day. Pump temperatures were set at 48°–54°F. Study results were quite significant. Wound drainage, analgesia, length of stay, and patient satisfaction were parameters measured.

Patients who used cold therapy aver-

aged 220 mL less wound drainage over the postoperative period which represented a 32% difference from the group that did not have the advantage of cold therapy.

Analgesia was measured by patient-controlled analgesia pumps. Those patients who received cold therapy used an average

of 76 cc's less pain medication than the group which did not have cold therapy. This represents a 49% decrease in perceived pain by the patient.

Length of hospital stay is an ever-increasing topic of discussion and in our study those patients that received cold

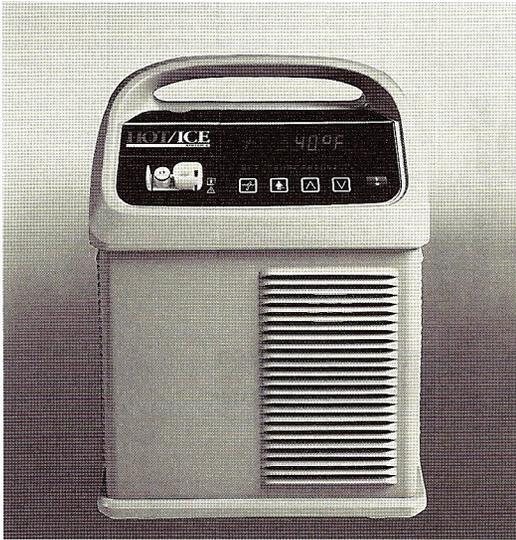


Figure 1. Cold therapy using the Hot/Ice System 3 lessens perceived pain and use of analgesia by patients, resulting in shorter hospitalization.

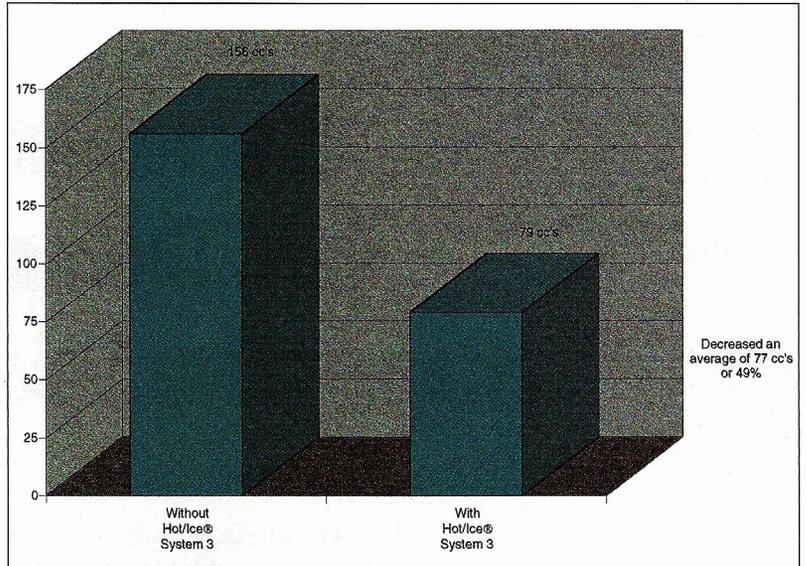


Figure 2. Use of analgesia.

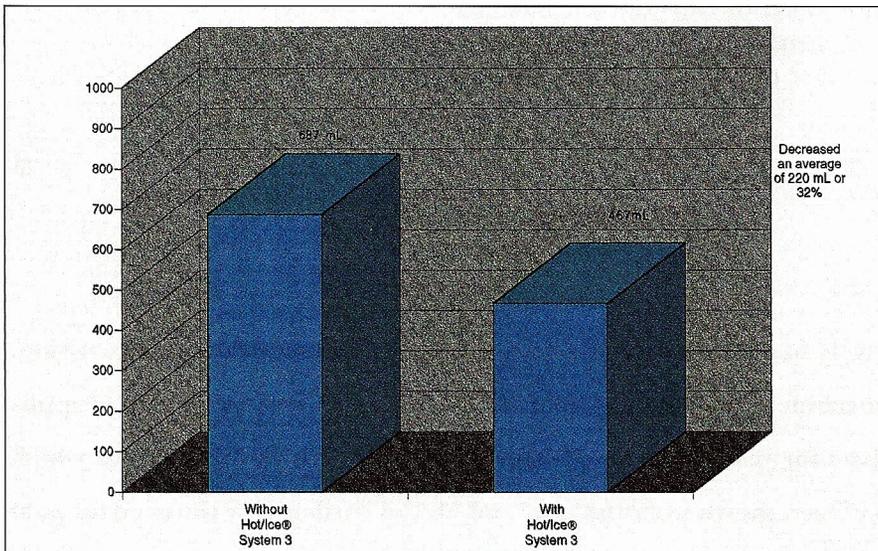


Figure 3. Average postsurgical drainage.

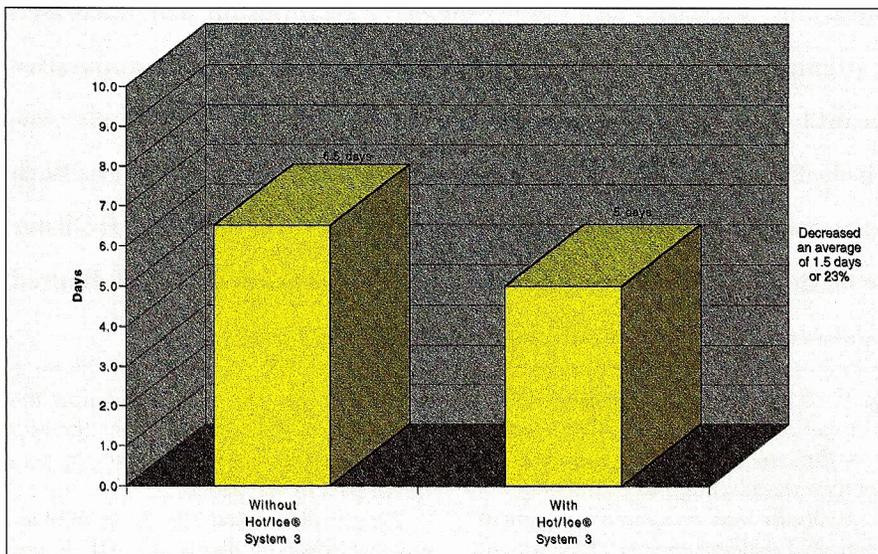


Figure 4. Length of hospitalization.

therapy decreased their length of stay by 1.5 days which represented a 23% decrease in hospital stay as compared to the group that did not receive cold therapy.

After discharge patients were contacted and surveyed regarding their experience with cold therapy. Patients were asked to rate their satisfaction with cold therapy both by evaluating subjectively if cold therapy was an effective modality in making them feel better in the postoperative period: Do you feel that the application of cold was helpful in reducing your level of postoperative discomfort? Were you satisfied with the use of cold applications after surgery? Patients rated their satisfaction with cold therapy as 8.5 on a scale that ranged from 1 (poor) to 10 (excellent). This indicated an overall positive experience with the application of cold therapy and the method in which cold was delivered. Patient satisfaction with a modality and perception that the modality was effective will increase compliance. A therapy that is well tolerated is more readily used.

DISCUSSION

Cold therapy has been shown to reduce pain through three separate mechanisms: (1) vasoconstriction and reduction of hematoma, (2) local numbness and anesthesia, and (3) inhibition of pain and reflex impulses which caused interruption of the pain/spasm cycle. In our experience postoperative pain, as measured by the amount of pain medication used by the patients, did indicate that cold therapy was effective in diminishing postoperative pain (Fig. 2).

Postoperative drainage was also evaluated

and the reduction of hematoma and the vasoconstrictive properties of cold were demonstrated by the reduction in postoperative wound drainage. Vasoconstrictive properties, through decreased local blood flow, did not inhibit wound healing based on the fact that there was no incidence of wound problems in the group that experienced cold applications (Fig. 3).

Length of stay was demonstrated to be decreased in the group that received cold therapy as compared to the group that did not. Patients that received cold therapy were ambulatory postoperatively sooner, as evidenced by their ability to participate in occupational therapy and instruction in activities of daily living. These patients also were discharged on an average of 1.5 days earlier than the other group which

led to a reduction in overall hospital costs (Fig. 4).

Patient satisfaction in the cold therapy group was high which led patients to be more compliant with the therapy.

As cost factors are an ever-increasing parameter in evaluating any therapy, we looked at the cost of the application of cold therapy with the Hot/Ice machine. At our institution, cold therapy costs approximately \$75.00 per day. Total cost for cold therapy for those patients throughout their hospital stay was \$375.00. The reduction in overall costs in decreased hospital stays equated to a savings of \$500.00 (average daily cost \$585.00 x 1.5 days decreased stay = \$878.00). This reduction outweighs the expense and provides an argument for the use of cold therapy.

When we consider the many positive benefits derived from cold therapy, we have found this to be a very effective modality in the postoperative care of surgical patients. **STI**

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