

CONSULTATIONS

Topical Heparin for Treatment of Acute Second-Degree Burns

For several years I have been treating acute second-degree burns with topical heparin 1,000 U/mL. The usual result when spraying the heparin onto the burned surface or aspirating bullae and injecting heparin is immediate relief of pain and probably decrease of inflammation, because often the erythema will noticeably blanch. The treatment has had no apparent side effects, and healing time appears to be accelerated. No further analgesic medication has usually been necessary.

Heparin is well known to inhibit the activation of factor XII. Agents such as kallikrein and trypsin can activate factor XII, yielding bradykinin as a by-product of the coagulation cascade. The cascade produces even more kallikrein, and noxious insult to the skin, such as a burn, releases an enzyme called timenogenase. This enzyme converts the ad-

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ditional kallikrein to bradykinin, which mediates inflammation and excites primary afferents.¹ One might surmise that blocking the activation of factor XII with heparin might abort this entire process and, indeed, this has been my experience. If occasionally no perceivable benefit is obtained, little is lost other than one or two minutes and a few milliliters of heparin.

Few physicians seem to be aware of this action of heparin, and if validated by a double-blind study, it could prove a valuable addition to burn therapy.

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1. Yaksh TL, Hammond DL: Peripheral and central substrates involved in the rostral transmission of nociceptive information. *Pain* 1982;13CD:1-85.

The immediate relief of pain in second-degree burns is obviously appealing to the physician in his attempt to alleviate pain and suffering. The mechanism of action may be

as Dr Goldstein postulates. However, there has actually been no scientific investigation of this postulate, and therefore we can neither prove nor disprove his thesis.

Heparin does have an anti-histaminic activity which could provide this pain relief. However, this is a very expensive way to treat the pain of burn injury. Several physicians in the past have used heparin both topically and systemically, and claim better pain relief and more rapid healing of the burns. However, these claims have never been substantiated in the scientific literature. Studies reported by Drs Robson and Heggers have shown no beneficial effect of heparin maintaining the patency of microvasculature in the area of burn injury. This was supported at the 1979 annual meeting of the American Burn Association. At the 1978 ABA meeting, Drs Travis and Bartlett, from Orange County, California, reported their experience with the use of heparin in experimental full-thickness burns in rats, and could find no apparent beneficial effect with systemic heparin therapy.

To my knowledge there are currently no experimental studies in process to determine the efficacy of topical heparin in acute burns. In my unofficial survey of burn center directors, I found none using this technique for pain relief in the burns of any size. In addition, none was interested in initiating a study to determine the efficacy of topical heparin for relief of pain, principally because of the expense of heparin. I have had no personal experience with the use of heparin, either topically or systemically.

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Through the years, physicians and victims alike have sought topical pain relief for burns. Tannic acid, tobacco juice, cobwebs, and many other remedies have been used and reported formally and anecdotally, and none has survived the test of time. Heparin, likewise, may have useful properties and may be used for awhile; however, due to lack of favorable scientific evidence and interest in further research it, too, will undoubtedly go by the wayside.

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Mild Anaphylactic Reaction from a Gerbil Bite

A 13-year-old girl developed swelling of both hands and feet and difficulty breathing immediately after being bitten on both hands by a gerbil. Physical examination revealed a teenager in moderate respiratory distress. She had a temperature of 36.7 C, a pulse of 112 beats per minute, a respiratory rate of 30, and a blood pressure of 130/70 mm Hg. She

was not cyanotic, and was moderately stridorous at rest. Examination of the chest revealed diffuse wheezing in all lung fields. There was no obvious swelling of the tongue or the lips. There was considerable swelling of the hands and, to a lesser extent, the feet.

The patient was treated with subcutaneous epinephrine

0.3 cc and Benadryl 25 mg IM. During a one-hour period there was complete resolution of her stridor and her wheezing.

To the best of my knowledge, this is the first reported case of an anaphylactic reaction from an animal bite. I can only assume there was some foreign protein in the gerbil's saliva that led to the girl's anaphylactic reaction. I would be interested to know if other emergency physicians have encountered such a problem in their practices.

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Allergic reactions to the bites of nonvenomous animals are very common. Occasionally more severe manifestations, such as mild anaphylaxis, are encountered. There is

certainly a paucity of reports of such instances in the medical literature, probably due to lack of interest and morbidity and mortality.

A broad spectrum of symptoms have been seen following the bites of a variety of animals, including locusts, mantises, crustaceans, fishes, lizards and snakes, mammals (moles, voles, mice, gerbils, foxes, raccoons, opossums, cats, bears, monkeys, and apes), and even vultures and owls.

Physicians caring for the personnel who work in zoos and other animal facilities frequently encounter such problems. Due to a lack of research in this area, there is no clear understanding of the antigenic factors in reactions of this type. Saliva, oral flora, or exogenous intraoral substances have all been implicated.

As Dr Corkum points out, routine, standard management of allergic and/or anaphylactic reactions usually is sufficient.

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