MAGNETIC-INFRARED LASER THERAPY IN MULTOMODALITY MANAGEMENT OF CHILDREN WITH BURNS

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The magnetic-infrared laser therapeutic device MILTA has been used since 1994 in therapy of 182 children with severe acute-stage burns. The rationale for combined use of magnetic-infrared laser (MIL) therapy was its unique biostimulating, antioxidant, analgesic, sedative, antioedematous adn antiinflammatory effects.

INDICATIONS FOR MIL THERAPY

The use of the MILTA device is recommendable for
(1) preoperative preparation of children with severe burns,
(2) hastening burn wound healing and preventing gross postburn scars,
(3) poor tissue regeneration in infected, poorly granulating wounds.

No **contraindications** for MIL therapy have been seen.

DIAGNOSIS

Visualization of burn wounds for poor or exuberant granulations, marginal epithelialization and complete healing.

Cytoscopy:
Membrane degradation products, i.e. cell detritus made of lipoproteins, phospholipids, lipid crystal and chromatin, was examined in slide imprints from wounds. The activity of phagocytes was usually depressed. Morphologically, it presented as incomplete phagocytosis (cytoplasmic inclusions of cell detritus fragments and microorganisms) and the presence of the nuclear substance, chromatin, in a larger part of the cell, contraction of the cytosol area. Phagocytes showed no pseudopodia, which impair chemotaxis, or inclusions of detritus and microorganisms.

METHOD

Magnetic-infrared laser treatment using the MILTA device was delivered during wound dressing in patients with severe burns after wound surface treatment with a 3 percent hydoroperoxide solution. Hydroperoxide consolidated effects of therapy by improving wound surface chemistries.
The radiation regimen used 1,000 Hz pulses delivered from a distance of 5-7 centimeters from the wound surface.
The terminal can be held statically above the wound surface sized up to 9 square centimeters. The exposure time was one minute. If the wound was larger, laser radiation was applied by sweeping the terminal at the same distance from the wound at the pace of 5 cm/s. Extensive wounds were treated for 10 min.

RESULTS

The healing of relatively small wound surfaces (9-25 sq.cm) occured as marginal epithelialization 5-7 days sooner as compared to conventional treatment. Wounds with elongate configurations and length-width ratios of 1:5 to 1:10 healed faster than round wounds.

Sluggishly granulating wounds debrided of purulent detritus, and showed prominent coloration and marked marginal epithelialization after two MIL treatments, within five days.

The dry dressing was never torn off from wound edges, as it would destroy marginal epithelialization. Dressings were removed after soaking with antiseptic solutions.

Laser treatment alone cannot be used for extensive poorly granulating wounds. It is an adjunct in preparation of the wound for autodermatoplasty.

Laboratory tests showed that regular laser treatment with wound redressing at a one-day interval returned the cell composition in the treated area to normal and induced change of repair phases once in three-four days.

Electron microscopy of lavage fluid from wounds showed fibroblasts and activated phagocytes (macrophages) with prominent pseudopodia as well as abundant phagocytes (intensive cell vacuolation) with inclusions of detritus fragments and digested microorganisms.