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3 | Insight in microcirculation and histomorphology during burn shock treatment using in vivo confocal-laser-scanning microscopy.

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ABSTRACT

PURPOSE: Microcirculatory disturbances are well known during shock; however, the accompanied histomorphological alterations are widely unknown. We used high resolution confocal-laser-scanning microscopy for the evaluation of microcirculation and histomorphology during Burn Shock treatment.

METHODS: Confocal-laser-scanning microscopy was performed in 10 burn shock patients (4 women, 6 men; aged 40.6 +/- 11.4 years, burn extent >20% body surface area) initially and 24 hours after shock resuscitation. Ten matched hemodynamic stable burn intensive care unit patients served as controls. The following parameters were evaluated: quantitative blood cell flow, cell size of the granular layer, basal layer thickness, and epidermal thickness.

RESULTS: Quantitative blood cell flow in controls was 62.45 +/- 3.39 cells per minute. Burn shock significantly reduced blood cell flow to 37.27 +/- 3.64 cells per minute; fluid resuscitation effectively restored baseline blood flow (65.18 +/- 3.76 cells per minute) after 24 hours. Granular cell size was 793.61 +/- 41.58 microm(2) in controls vs 644.27 +/- 42.96 microm(2) during burn shock. Post resuscitation granular cell size measured 932.74 +/- 38.83 microm(2). Basal layer thickness was 14.84 +/- 0.59 microm in controls, 13.26 +/- 0.54 microm in burn patients at admission and before resuscitation, and 17.50 +/- 0.46 microm after resuscitation. Epidermal thickness in control patients was 49.60 +/- 2.36 microm, 37.83 +/- 2.47 microm in burn patients at admission and 69.50 +/- 3.18 microm after resuscitation.

CONCLUSIONS: Confocal-laser-scanning microscopy provides a noninvasive tool for simultaneous evaluation of microcirculation and tissue histomorphology. It may help to assess the adequacy of and response to resuscitation of burn patients early after trauma.