

THE MISTIC STUDY - A PROSPECTIVE OBSERVATIONAL STUDY OF THE SYSTEMIC RESPONSE TO INJURY AND OUTCOMES OF SMALL BURNS IN PRE-SCHOOL CHILDREN (068)

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Introduction: The MISTIC Study (Morbidity In Small Thermal Injury in Children) is a prospective, multi-centre, observational cohort study of burn injuries of less than 10% total body surface area (TBSA) in children of less than five years of age in England.

Burn injuries in this age group constitute 70% of the workload of paediatric burn services in the UK. Despite this, there has been little research into the physiological response to the burn injury in these children. It is known that children can become systemically unwell during the healing process. It is often difficult to determine whether this is caused by a community acquired viral illness, a burn-related infection, a toxic shock syndrome (TSS)-like illness or a systemic inflammatory response to the burn injury in the absence of infection. The aims of this study are to identify the typical physiological inflammatory response to small burn injury in pre-school children, and to identify risk factors, differentiating symptoms, signs and biochemical variables that will assist in the diagnosis of post-burn illness.

Methods: Five hundred children were recruited into the study at three regional paediatric burns services from across England. Eligible children were those that were less than five years of age with less than 10% TBSA burns from any mechanism who present to the service within 48 hours of injury. Data were collected prospectively from medical records, parental questionnaires and from daily parent-recorded temperature readings. If children became systemically unwell whilst the burn was healing, the clinical symptoms and signs, laboratory investigation results, management plan and discharge diagnoses were recorded.

Results: The median age was 1.8 years (IQR: 1.3 to 3.0), the median burn size was 1.5%TBSA (IQR: 0.25 to 2.00). Scald was the commonest mechanism (55%), followed by contact burn (42%). Post-injury follow-up was achieved for 78% of participants. One in four children experienced an unexpected period of illness within two weeks of injury, and one in ten children required readmission to hospital for management of this illness. Diagnoses included: community-acquired infections, wound infection and toxic shock-like illness. A sub-set of children demonstrated a physiological injury response, despite the small size of their burn injury. This physiological response is demonstrated through temperature profiles for the week following injury showing how temperature varies in relation to time after injury and size of burn, and through a positive correlation shown between baseline CRP level and increasing size of burn ($p < 0.001$, $r = 0.8$).

Conclusions: We present the demographics and injury profiles, illustrate the physiological response to small burn injury, and describe presentations of early post-burn illness in the children recruited into this study. Potential risk factors and discriminators for early post-burn illness are described which could help in identifying children at high risk of this complication.