Summary of paper #5

Fluid resuscitation in paediatric burns: how do we get it right? A systematic review of the evidence

This article is a systematic review to identify studies using endpoints to guide fluid resuscitation in children with burns. Quantification of burn depth and affected total body surface area (TBSA) is difficult for each individual patient because of varying burn size, depth and aetiology. Fluid requirements are also affected by traumatic and inhalation. Children have a greater surface area to weight ratio than adults and have greater relative insensible and burn-related fluid losses. So, determining optimal fluid resuscitation is a key determinant for children with severe burns. Following is the objectives of this review:

1. Describe the methods of endpoint monitoring for fluid resuscitation in children younger than 16 years of age with burns.
2. Review the range of reported endpoint targets.
3. assess whether there is evidence that targeted endpoints in children with burns impact on the outcome

All studies with related keywords including burns, fluid resuscitation, endpoints, goal-directed therapy were found. Medline, Embase, Cinahl and the Cochrane Central Register of Controlled Trials databases were searched and found studies were excluded considering different criteria. Finally 7 articles were studies in details and compared.

Three main endpoints were used in these studies.

1. UO with vital signs (considered as conventional therapy)
2. albumin
3. invasive haemodynamic variables. (transpulmonary thermodilution (TTD) parameters including intrathoracic blood volume, cardiac index (CI) and extravascular lung water)

The majority of studies used UO as the primary endpoint. Only one study set a minimum UO target (>1 mL/kg/hour). Some studies targeted a UO range (the target range varied from 0.5–1.0 mL/kg/hour to 2–3 mL/kg/ hour). Three studies reported a protocolised response to UO outside the target range. But there is no comparison between different target ranges. One study showed

that administering 5% albumin solution early, alongside targeted UO, reduced fluid requirements, subsequent oedema and duration of hospital stay.

This systematic review did not identify evidence to suggest that one endpoint or target is superior to another. The outcome data were not robust enough to draw conclusions on the clinical effectiveness of targeted endpoints.
heterogeneous nature of the studies
identified precluded a meta-analysis