A critically ill infant with multi-organ dysfunction due to eczema

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Eczema is the most prevalent childhood atopic illness routinely encountered by health professionals providing care to children.[1] Some infants become critically ill and present to the paediatric intensive care unit (PICU) with this seemingly trivial condition.[2] This anonymised (no clinical and laboratory data are presented) case of severe eczema and multi-organ dysfunction illustrates the extent of multi-organ involvement in eczema and the medical and psychosocial issues associated with the disease.[1,3]

A 6-month-old boy with eczema and septic shock presented to the emergency department. He was treated with fluid resuscitation and subsequently admitted to a PICU. Derangement of multiple organ functions were identified along with failure to thrive and poor development (Table, Figs 1 and 2).

TABLE. Multiple organ dysfunction in an infant with 'status eczematicus'

Organ system	Presentation
Central nervous system	– Global developmental delay – Cerebral atrophy – Oromotor dysfunction
Cardiac	– Distributive shock requiring inotropic support at presentation
Renal	– Stage 3 acute kidney injury related tubular dysfunction, likely secondary cause or iatrogenic due to herbal medicine, or malnutrition – Normal anion gap metabolic acidosis – Hypokalaemia, hypomagnesaemia and hypoalbuminaemia at presentation
Endocrine	– Sick thyroid – Hyperparathyroidism secondary to vitamin D deficiency
Haematology	– Anaemia due to poor nutritional status
Nutrition	– Severe failure to thrive, growth centiles drop from 90th centile to <3rd centile (Fig) – Zinc deficiency – Severe vitamin deficiency – Low copper and ceruloplasmin level – Cow's milk protein allergy, specific immunoglobulin E strongly positive for egg white and milk protein, required extensively hydrolysed formula

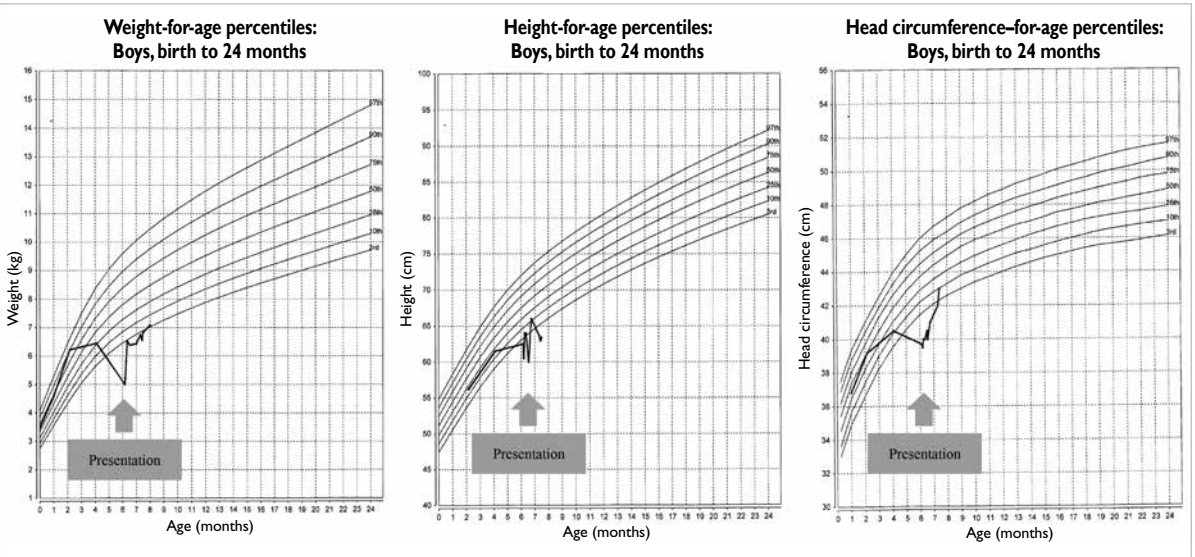

FIG 1. Growth charts of failure to thrive at presentation and catch-growth after treatment

FIG 2. Poorly controlled eczema

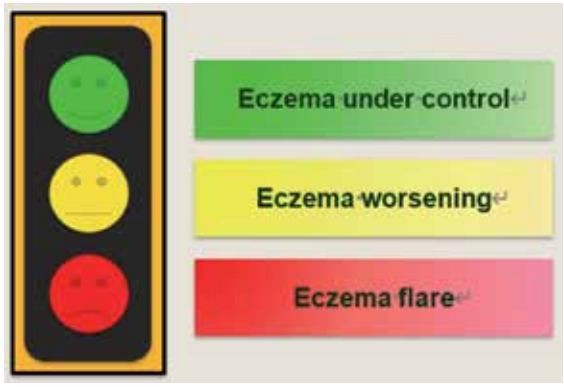

FIG 3. 'Traffic Light Control' self-assessment system on eczema control[5]

Dobutamine and broad-spectrum antibiotics were prescribed. Although his condition improved rapidly, it became apparent that his parents did not trust Western medicine and were reluctant to use emollient and topical steroid to manage their child's eczema. The mother frankly admitted that since the development of eczema at 2 months of age, she had been giving the infant complementary herbal medicine remedies. She was also taking herbal medicine whilst breastfeeding so that her child would indirectly receive the more 'effective' herbal medicine. The parents were interviewed by healthcare workers from various disciplines but they remained resolute in their beliefs and phobias about Western medicine. The child was discharged from PICU after the acute medical issues were resolved. Extensive investigations have been performed and apart from persistent peripheral eosinophilia, slightly low immunoglobulin M level, borderline CD4:CD8 ratio and borderline low zinc level, all other investigations including metabolic workup remain unremarkable to date. Further paediatric dermatology, genetics and integrative medicine follow-ups have been arranged.

Our reported case is probably the youngest patient with critical 'status eczematicus' to survive. All growth parameters were compromised (Fig 1). Children with severe eczema rarely require admission to an ICU and there are very few such cases in the literature. Mortality due to eczema is rare, but we have previously reported a tragic case of an infant with eczema who died of group B streptococcus septicaemia and malnutrition despite expensive dietary supplements.[2] Eczema is a chronic condition that can significantly affect a child's quality of life as well as that of their family if it is not well controlled due to the potentially significant psychological toll.[4] Although ICU is not an ideal setting to manage a family with multiple phobias, the child must first be stabilised, and other differential diagnoses of acute skin failure ruled out.[2]

Acute treatment of eczema is straightforward but long-term maintenance treatment is always challenging. Topical medications should be considered to prevent exacerbations and therapy should be proactive. Steroid phobia is prevalent and often leads to non-compliance.[1]

Recommendations about dietary avoidance should be specific and given only in confirmed cases of food allergy.[1] The use of traditional and proprietary topical and herbal medicine is popular across many countries in Asia.[1] Anxious food-avoiding parents may purchase multi-vitamin supplements, prebiotics, probiotic or symbiotics that claim to be effective. In an extreme case, death was reported to have a secondary association with extreme dietary practice.[3] Physicians must be tactful when counselling these anxious parents who are steroid phobic and mistrusting of modern medicine. Indirect administration of herbal medicine to an infant through breastfeeding is not advocated even in the practice of integration medicine.

Management of eczema can sometimes be challenging. Apart from strong parental beliefs, cultural differences might also play a role in compliance with a prescribed treatment plan or a tendency to seek alternative therapies instead. These effects are likely to be underestimated in our community, especially in the primary care setting where consultation time might be limited. Physicians should endeavour to spend more time exploring parental beliefs. A practical solution may be to use an objective self/parental assessment to

aid eczema control assessment, eg, 'Traffic Light Control' self-assessment system (Fig 3) and quality of life assessment, eg, Children's Dermatology Life Quality Index.[5] An 'eczema action plan' can also be given to parents to remind them of the prescribed eczema treatment. The treatment plan should be straightforward and easy to follow, especially if they perceive a worsening of eczema between clinic visits.[5] A multidisciplinary and perhaps integrative medicine approach should be adopted where possible to manage patients and families with eczema, and education about the disease should be individualised to improve patient outcomes.

Healthcare providers must be aware of the mortality and morbidity associated with recalcitrant eczema and 'status eczematicus'. These tragic cases of 'status eczematicus' serve to remind us of the grave consequences if eczema is inappropriately managed.

Author contributions

All authors contributed to the concept or design, acquisition of data, analysis or interpretation of data, drafting of the manuscript, and critical revision of the manuscript for important intellectual content.

All authors had full access to the data, contributed to the study, approved the final version for publication, and take responsibility for its accuracy and integrity.

Conflicts of interest

As an editor of the journal, KL Hon was not involved in the peer review process. Other authors have disclosed no conflicts of interest.

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Ethics approval

The patient was treated in accordance with the tenets of the Declaration of Helsinki. Ethics approval for publication of patient information in the paediatric intensive care unit was obtained from the Hong Kong Children's Hospital Research Ethics Committee (Ref No.: HKCH-REC-2019–0011).

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