



## Fever in children – what it means and what to do



This month's issue of the *SAMJ* features two important papers that address the management of fever<sup>[1]</sup> and the analysis of blood cultures<sup>[2]</sup> in sick children.

Fever is a symptom that alarms parents and caregivers alike. Yet, fever in itself poses little to no risk to the child. Rather, it is often a symptom of a minor self-limiting illness, such as viral upper-respiratory infection, and is a positive response of the body. However, it may be a sign of common, major illnesses that carry high morbidity and mortality. Serious bacterial infections such as pneumonia, which is the 4th most common cause of death in children in South Africa, often present with fever.<sup>[3]</sup> Also, malignancies such as acute lymphoblastic leukaemia and connective tissue diseases such as rheumatic disease<sup>[4,5]</sup> often present with fever as an initial feature.

It is important that the underlying causes of the fever are established, as they are crucial in determining the risk of severe illness. Although nurses and doctors may be the first to see a child with fever, pharmacists and pharmacy workers are often approached for medications to relieve fever. The acute fever guideline<sup>[2]</sup> that seeks to assist these primary contact professionals is authored by colleagues drawn from both the public and private healthcare sectors and reflects the available evidence supported by clinical experience. 'The expert opinion' is therefore practical and flexible.<sup>[6]</sup> Based on the evidence, the authors present a definition of fever and advise on measurement of body temperature, general principles on management and criteria for referral for further investigation by a specialist.

Three algorithms are presented, each addressing relevant issues. The first emphasises the importance of history and physical examination that should be undertaken by a clinician. First impressions are very important to spot the 'toxic' child and features of dehydration. This algorithm is very similar to the World Health Organization's Integrated Management of Childhood Illness (IMCI),<sup>[7]</sup> which is utilised in many countries by healthcare workers who are specifically trained to assess the febrile child undertake at first contact.

The second algorithm addresses the very important aspects of investigating an acute fever in children aged 0 - 3 months, which is the most difficult age group for both nurses and doctors. Guidance is offered for a baby <1 month of age, who should always be referred to a specialist paediatrician, and those between 1 - 3 months of age.

The third algorithm deals with the child >3 months of age and signals clear risk factors for urgent referral, indicating also those for whom there is intermediate or low risk.

Bacterial infections that should be excluded and warrant antibiotic therapy are emphasised. The guideline provides very valuable information on age-specific vital signs and the important laboratory values that assist with diagnosing systemic inflammatory response syndrome. Clear advice is offered for antibiotic administration and for the management of pain and fever. The recommended dosages of paracetamol and ibuprofen, both of which are safe in children,<sup>[8]</sup> are listed. Significantly, randomised controlled trials have shown no real benefit in using these agents together.<sup>[9,10]</sup> Non-steroidal anti-inflammatory drugs and their contraindications and precautions are discussed.<sup>[11]</sup> The guideline should be distributed widely to all first-contact health workers, but does not obviate the need for on-going training.<sup>[12]</sup>

The paper by Lochlan *et al.*<sup>[2]</sup> describes an analysis of 47 677 blood cultures taken from children between 2008 and 2012 at the Red Cross

War Memorial Children's Hospital and addresses the technique of collecting blood samples for culture and the interpretation of results.<sup>[2]</sup> Overall, 6.2% of the blood cultures revealed pathogenic organisms with fewer positive cultures in children >1 year of age<sup>[2]</sup> with contamination of blood cultures ranging from 5.9% to 7.2% per annum. Of the pathogenic isolates, Gram-positive bacteria accounted for 36.5% with, not unexpectedly, *Staphylococcus aureus* and *Streptococcus pneumoniae* being the most common isolates. The proportion of isolates due to *S. pneumoniae* has declined significantly over the last 5 years, which the authors suggest is accounted for by the childhood pneumococcal immunisation programme, as might the IMCI policy of administering ceftriaxone to all children prior to transfer or referral. Gram-negative bacteria accounted for 56.6% of isolates with the Enterobacteriaceae dominating; while *Klebsiella pneumoniae* declined annually, attributable to infection control measures, *Acinetobacter baumannii* increased.

Correct technique<sup>[13,14]</sup> for obtaining the blood culture is imperative and extra effort should be undertaken in the younger baby from whom it is technically more difficult to obtain a reasonable sample of blood. Infection control measures and the on-going training and awareness of staff are important to reduce blood culture contamination.



**Miriam Adhikari**

Postgraduate Office, School of Clinical Medicine, College of Health Sciences, University of KwaZulu-Natal, Durban, South Africa  
adhikari@ukzn.ac.za

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