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Variation in practice remains in the UK management of paediatric febrile neutropenia.

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Serious infection affects around 20% of patients who present febrile and neutropenic[1]. Febrile neutropenia is thus a well-recognised medical emergency. Addressing the challenges of both rapid delivery of antibiotics to patients at risk of life-threatening sepsis, as well as appropriate antibiotic stewardship to reduce antibiotic overuse, continue to keep this a priority for clinicians, patients and parents. Audits of febrile neutropenia (FN) practice have previously demonstrated variation in definitions for FN and its management[1,2]. In September 2012, the National Institute for Clinical Excellence (NICE) published the 'Neutropenic sepsis: prevention and management of neutropenic sepsis in cancer patients'[3] guideline and we sought to assess if this has reduced variations in practice.

This re-audit included 45 UK centres (14 CCLG principal treatment centres). The centres completed questionnaires regarding their febrile neutropenia policy and any admissions over a 2 week period in March 2015. 108 episodes from 30 centres were recorded ranging from 0-10 episodes per centre.

The results show continued variability in definition and management. The NICE suggested definition of FN (temperatures > 38 °C and neutrophil count of <0.5) is used by 21/43 (49%) centres (see table 1). Only 19/45 (42%) centres use risk stratification at admission (a modified Alexander approach in 16 centres, as suggested by NICE, with one centre using the SPOG model[4] and two setting up their own stratification system).

The NICE guideline suggests patients presenting with FN should have central and peripheral blood cultures and blood tests including CRP and lactate. Central blood cultures were sent in over 90% of episodes and 19% of episodes had peripheral blood cultures performed but only two centres routinely performed paired blood cultures. CRP was analysed in 83% of episodes but lactate in only 15% of admissions with 6 centres routinely testing lactate on presentation.

37% centres use single agent piperacillin/tazobactam as initial antibiotic treatment, 34% use piperacillin/tazobactam with an aminoglycoside and 13% meropenem alone. Overall, 62% of inpatients received their antibiotics within 60 minutes of admission or febrile episode. 9 of 17 centres with multiple admissions over the 2 week period administered the first dose of antibiotic within 60 minutes in ≥ 80% of occasions.

44 (40%) episodes were assessed as low risk at 48hrs with 28 (64%) switching to oral antibiotics and 16 (36%) continuing IV therapy. Antibiotics were stopped upon resolution of fever irrespective of neutrophil count in 75%, whilst 14% appropriately continued antibiotics to treat a confirmed infection. In 11% of episodes the reason for continuation of antibiotics was unclear.

The results show continuing variation in practice and a lack of adherence to NICE guidance. The variance has not significantly changed since the previous audit in 2012. Participating centres have been sent the results plus centre specific analysis to see their results in comparison to national practice and guidelines. A re-audit is planned for 2016. The adoption of a national policy on neutropenic sepsis management based on the best available evidence of clinical effectiveness and cost-effectiveness requires local implementation but should improve outcomes.

References:

1. Phillips R, Selwood K, Lane SM, *et al*. Variation in policies for the management of febrile neutropenia in United Kingdom Children's Cancer Study Group centres. Arch Dis Child 2007;92:495–8.

2. Bate J, Gibson F, Selwood K, *et al*. A reaudit of current febrile neutropenia practice in UK paediatric oncology centres prior to implementation of NICE guidance. Arch Dis Child 2013;98:315-6.

3. NICE guideline CG151. "Neutropenic sepsis: prevention and management of neutropenic sepsis in cancer patients", 19 September 2012.

4. Ammann RA1, Bodmer N, Hirt A, Niggli FK, Nadal D, Simon A, Ozsahin H, Kontny U, Kühne T, Popovic MB, Lüthy AR, Aebi C. Predicting adverse events in children with fever and chemotherapy-induced neutropenia: the prospective multicenter SPOG 2003 FN study. J Clin Oncol. 2010 Apr 20;28(12):2008-14.

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Contributorship statement:

Study designed by B Philips, J Bate, E Johnson and J Chisholm.

Data analysis and initial report writing performed by F Herd with significant editing and review by B Philips and J Bate.

E Johnson and J Chisholm reviewed final manuscript.

Table 1: Definitions reported to be used for defining febrile neutropenia

Definitions of febrile neutropenia				
	Neutrophil count			
Temperature cutoff	<0.5	<0.5 or <1 and falling	<0.75	<1
>38.5°C or 2 measurements >38.0°C 1 hour or more apart	1	2	1	1
>38.5°C or 2 measurements >38.0°C 4 hour or more apart	2		2	
>38°C	**21***	4	5	4

* NICE recommended definition