

PostScript

LETTERS

If you have a burning desire to respond to a paper published in *ADC* or *F&N*, why not make use of our "rapid response" option?

Log on to our website (www.archdischild.com), find the paper that interests you, click on "full text" and send your response by email by clicking on "submit a response".

Providing it isn't libellous or obscene, it will be posted within seven days. You can retrieve it by clicking on "read eLetters" on our homepage.

The editors will decide, as before, whether to also publish it in a future paper issue.

Problems with scoring bruises

We write to draw attention to two problems with the recent study on a scoring system for bruising by Dunstan *et al.*¹

Firstly, the authors did not publish confidence intervals for the likelihood ratios (LRs) derived from different score threshold values (table 3), thereby not allowing readers to judge whether the LRs are statistically—let alone clinically—significant.

Secondly, the authors neglect the phenomenon of spectrum bias. This is a well described feature of many tests, whereby sensitivity and specificity (and hence derived LRs) of a test vary with disease severity or prevalence. Examples of spectrum bias have been described with several tests including exercise stress testing² and UTI diagnosis.³

The study population had a prevalence of physical abuse of 40%, much higher than the general paediatric population. Since test performance—that is, LR—is not independent of the pre-test probability, the LRs generated by a study done on this population cannot necessarily be used in a population with a much lower prevalence of abuse, as the authors have done in table 4. Since spectrum bias tends to reduce test performance as the pre-test probability falls,⁴ the LR for any given score threshold would be smaller than that quoted when applied to a population with a lower prevalence of physical abuse.

As most settings would expect to have a lower prevalence of physical abuse than the study, this reduces the value of the proposed scoring system as a clinical tool.

M Williams

Intensive Care Unit, Charing Cross Hospital, London, W6 8RF, UK

B Krishnan

Department of Paediatrics, Guy's Hospital, London SE1 9RT, UK

Correspondence to Dr Williams; matt@mwilliams.org

References

- 1 Dunstan FD, Guilead ZE, Kontos K, *et al.* A scoring system for bruise patterns: a tool for identifying abuse. *Arch Dis Child* 2002;**86**:330–3.
- 2 Okin PM, Kligfield P. Gender-specific criteria and performance of the exercise electrocardiogram. *Circulation* 1995;**92**:1209–16.

3 Lachs MS, Nachamkin I, Edelstein PH, *et al.* Spectrum bias in the evaluation of diagnostic tests: lessons from the rapid dipstick test for urinary tract infection. *Ann Intern Med* 1992;**117**:135–40.

4 Hlatky MA, Pryor DB, Harrell FE Jr, *et al.* Factors affecting sensitivity and specificity of exercise electrocardiography. Multivariable analysis. *Am J Med* 1984;**77**:64–71.

Does cefotaxime eradicate nasopharyngeal carriage of *N meningitidis*

We enrolled 43 children admitted with an unequivocal clinical diagnosis of meningococcal sepsis into a study to determine whether cefotaxime eradicated nasopharyngeal carriage of *Neisseria meningitidis*. In 28 cases (70%) the diagnosis was confirmed by positive culture from blood, nose, throat, or skin scraping, detection of meningococcal DNA in blood by polymerase chain reaction, or convalescent meningococcal serology. All children were treated with intravenous cefotaxime for seven days. Nasopharyngeal and throat swabs were obtained on the day of admission in 42 of these children, and all children had swabs repeated every day until there were at least two negative swabs.

On admission, the throat and nasopharyngeal swabs were both positive for meningococcus in two patients; in another two patients, the nasopharyngeal swab was positive while the throat swab was negative. In three patients the swabs became negative after 24 hours of treatment, and in one child it became negative after 48 hours. In these children and others in whom the swabs were negative from the day of admission, subsequent swabs remained negative.

Compared to a previous study¹ that reported a nasopharyngeal carriage rate of 50% on admission and showed that the yield of meningococci in throat swabs was unaffected by prior administration of penicillin, the yield from throat and nose swabs in this study (9.5%) was poor. This may reflect the fact that in practice many of these swabs were taken after the child had been given the first dose of cefotaxime. The study suggests that cefotaxime, like ceftriaxone,² is effective in eradicating nasopharyngeal carriage, and in children treated with cefotaxime, additional prophylaxis with rifampicin is not necessary. However, no recommendations for the use of cefotaxime alone can emanate from these findings as the sample size was small and study design did not compare cefotaxime with gold standard treatment (either rifampicin or ceftriaxone). We are keen to coordinate a follow up multicentre study this winter involving paediatric intensive care units across the country to compare the efficacy of ceftriaxone with cefotaxime on eradication of meningococcal carriage. Interested units are kindly requested to contact us.

J Clark, R Lakshman, A Galloway, A Cant
Newcastle General Hospital, UK

Correspondence to: J Clark, Department of Child Health, Newcastle General Hospital, Newcastle upon Tyne NE4 6BE, UK; julia.clark@nuth.northy.nhs.uk

References

- 1 Cartwright K, Reilly S, White D, *et al.* Early treatment with parenteral penicillin in meningococcal disease. *BMJ* 1992;**305**:143–7b.

2 Schwartz B, Al-Tobaiqi A, Al-Ruwais A, *et al.* Comparative efficacy of ceftriaxone and rifampicin in eradicating pharyngeal carriage of group A *Neisseria meningitidis*. *Lancet* 1988;**1**:1239–42.

Pneumocystis carinii pneumonia in an infant with transient hypogammaglobulinaemia of infancy

Transient hypogammaglobulinaemia of infancy (THI) is characterised by prolongation of the physiological decline in serum immunoglobulin concentrations seen in the first six months of life.¹ The incidence reported from an Australian paediatric centre was estimated as 23 per 10⁶ live births.² It has been reported that THI does not usually predispose to significant infection.^{1,2}

A male infant born at term to non-consanguineous parents presented at 3.5 months with cough, tachypnoea (70 breaths/minute), wheeze, crepitations, and hypoxia. A chest radiograph showed hyperinflation and patchy opacification in the hilar regions and upper lobes. *Pneumocystis carinii* was identified in bronchoalveolar lavage by toluidine blue staining. The immunological findings of this child were consistent with those of THI with an IgG level less than the fifth centile³ and absent serum IgA^{1,2} which resolved with age (IgG at presentation 3.9 g/l (normal: 1.39–8.04); at 5 months 2.23 (1.39–8.04); at 10 months 1.77 (2.02–11.76); at 17 months 7.51 (2.71–13.78); IgA at 5 months <0.07 g/l (normal: 0.14–0.69); at 13 months 0.14 (0.17–1.34)) and evidence of specific antibody production to tetanus, diphtheria, and *Haemophilus influenzae* type b following immunisation.¹ T cell numbers (total lymphocytes 6.2 × 10⁹/l, CD3 68%, CD4 56%, CD8 15%) and phytohaemagglutinin induced proliferation were normal. At 3 years the child was well with normal IgG, IgA, and IgM levels.

Pneumocystis carinii pneumonia presenting in the first three months of life is an infection typically seen in patients with significant T cell immunodeficiencies and X linked hyper IgM. These were excluded by normal T cell numbers and function and by normal CD40 ligand expression and mutation analysis. There are reports of *Pneumocystis carinii* pneumonia in immunocompetent infants³ and agammaglobulinaemia.⁴ This is the first description of *Pneumocystis carinii* pneumonia in a patient with THI.

J M Smart, A S Kemp

Department of Immunology, Royal Children's Hospital, Flemington Road, Parkville 3052, Australia; kempa@cryptic.rch.unimelb.edu.au

D S Armstrong

Department of Respiratory Medicine, Royal Children's Hospital

References

- 1 Tiller TL Jr, Buckley RH. Transient hypogammaglobulinemia of infancy: review of the literature, clinical and immunologic features of 11 new cases, and long-term follow-up. *J Pediatr* 1978;**92**:347–53.
- 2 Walker AM, Kemp AS, Hill DJ, *et al.* Features of transient hypogammaglobulinaemia in infants screened for immunological abnormalities. *Arch Dis Child* 1994;**70**:183–6.
- 3 Stagno S, Pifer LL, Hughes WT, *et al.* *Pneumocystis carinii* pneumonitis in young immunocompetent infants. *Pediatrics* 1980;**66**:56–62.

- 4 Alibrahim A, Lepore M, Lierl M, *et al.* Pneumocystis carinii pneumonia in an infant with X-linked agammaglobulinemia. *J Allergy Clin Immunol* 1998;**101**:552-3.

Procalcitonin as a prognostic marker in children with meningococcal septic shock

Carrol and coworkers¹ confirm the findings from Karabocuoglu *et al* who reported that procalcitonin (PCT) was higher in children with severe meningococcaemia (fever, petechia or purpura, and hemodynamic instability) than in children with systemic meningococcal infection without shock (291.29 ± 167 v 19.7 ± 23 ng/ml; $p < 0.001$).²

Unfortunately, information is lacking in the report of Carrol *et al.*¹ namely: a clear definition of severe MCD (defined in their paper as a Glasgow Meningococcal Septicaemia Prognostic Score ≥ 8) and median PCT values of survivors and non-survivors and comparison in term of prediction of outcome between PCT level and generic or specific severity scoring systems. We report that admission PCT level is an accurate predictor of mortality in the subgroup of children with meningococcal septic shock (MSS). We prospectively investigated 35 children (median age: 16 months; Q1-Q3:45) with MSS (defined as ecchymotic or necrotic purpura with shock, needing fluid expansion (median for the first 24 hrs: 90 ml/kg; Q1-Q3: 48-120) and catecholamine infusion) admitted to our PICU between July 1999 and May 2002. We estimated the accuracy in predicting death of PCT, C reactive protein (CRP: nephelometry)³ on admission, and the Pediatric Risk of Mortality (PRISM) score⁴ within 24 hrs of admission or at the time of death. Sensitivity, specificity, positive and negative predictive values, and percentage of well classified children were calculated at the following cut-off values: PCT >130 ng/ml (the best cutoff value of the PCT level was determined by χ^2 optimisation (Fisher's test: $p=0.0004$)), CRP <100 mg/l³, PRISM value >20 and PRISM probability of death $>50\%$.⁵ For each severity index, we calculated the area under the ROC curve (AUC) and the standard error (SE)⁶ and determined the significance of comparisons.⁷

Eleven of 35 children died (31%); predicted mortality with the PRISM score was 15.6 (standardised mortality ratio: 0.71; 95% confidence interval: 0.35-1.26). The median (Q1-Q3) PCT and CRP levels and PRISM value and probability of death were the following: (survivors v nonsurvivors) PCT 73 (15-210) v 277 (208-606) ng/ml ($p=0.001$); CRP 92 (44-160) v 72 (41-109) mg/l ($p=0.25$); PRISM value 17 (8-22) v 33 (26-37) ($p < 10^{-3}$); PRISM probability 19 (4-42) v 88 (63-95) % ($p < 10^{-3}$). Performance characteristics and AUC $\pm$ SE of PCT, CRP, and PRISM score are given in the table and the figure.

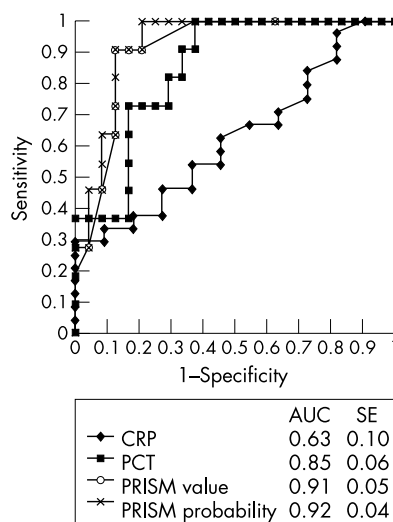


Figure 1 ROC curves (AUC $\pm$ SE) for PCT, CRP, and PRISM score in 35 children with MSS (PCT v PRISM value, $p=0.45$; PCT v PRISM probability, $p=0.31$; PCT v CRP, $p=0.06$; CRP v PRISM value, $p < 10^{-2}$; CRP v PRISM probability, $p < 10^{-2}$).

In our study, PCT on admission was as accurate as the PRISM value and PRISM probability of death calculated within 24 hrs of admission or at the time of death, and more accurate than the CRP level in classifying survivors and nonsurvivors of MSS. These results accord with those of Hatherill *et al* who observed, in 37 children with MSS, that admission PCT level (values not indicated) was higher in nonsurvivors (11%) than in survivors ($p=0.04$) and related to the severity of organ failure ($p=0.02$); however, in the whole group of children with septic shock whatever the causative organism, admission PCT functioned worse than the PRISM score (AUC 0.73 (0.59-0.88) v 0.83 (0.71-0.93); statistical comparison not performed).⁸

The PRISM score is accepted in PICUs worldwide and has been reported to accurately predict outcome of meningococcal disease.^{9,10} However, as it needs a 24 hour observation period, it cannot be used as an inclusion criterion for clinical trials. Admission PCT could represent a good alternative tool if further studies confirm its ability to predict mortality.

F Leclerc, S Leteurre, O Noizet, A Dorkenoo, A Sadik, R Cremer, C Fourier

Paediatric Intensive Care Unit, University Hospital of Lille, Lille, France

Correspondence to: Professor Leclerc, Hôpital Jeanne de Flandre, 59037, Lille, France; fleclerc@chru-lille.fr

References

- 1 Carrol ED, Newland P, Riordan FAI, *et al.* Procalcitonin as a diagnostic marker of meningococcal disease in children presenting with fever and a rash. *Arch Dis Child* 2002;**86**: 282-5.
- 2 Karabocuoglu M, Kaya O. Plasma procalcitonin levels correlated with the severity of systemic meningococcal disease in children. *Crit Care Med* 2000;**28**(Suppl):A170.
- 3 Leclerc F, Chenaud M, Delepoulle F, *et al.* Prognostic value of C-reactive protein level in severe infectious purpura: a comparison with eight other scores. *Crit Care Med* 1991;**19**:430-2.
- 4 Pollack MM, Ruttimann UE, Getson PR. Pediatric risk of mortality (PRISM) score. *Crit Care Med* 1988;**16**:1110-6.
- 5 Mok Q, Butt W. The outcome of children admitted to intensive care with meningococcal septicaemia. *Intensive Care Med* 1996;**22**:259-63.
- 6 Hanley JA, McNeil BJ. The meaning and use of the area under a receiver operating characteristic (ROC) curve. *Radiology* 1982;**143**:29-36.
- 7 Hanley JA, McNeil BJ. A method of comparing the areas under receiver operating characteristic curves derived from the same cases. *Radiology* 1983;**148**:839-43.
- 8 Hatherill M, Tibby SM, Turner C, *et al.* Procalcitonin and cytokine levels: relationship to organ failure and mortality in paediatric septic shock. *Crit Care Med* 2000;**28**:2591-4.
- 9 Castellanos-Ortega A, Delgado-Rodriguez M. Comparison of the performance of two general and three specific scoring systems for meningococcal septic shock in children. *Crit Care Med* 2000;**28**:2967-73.
- 10 Leteurre S, Leclerc F, Martinot A, *et al.* Can generic scores (Pediatric Risk of Mortality and Pediatric Index of Mortality) replace specific scores in predicting the outcome of presumed meningococcal septic shock in children? *Crit Care Med* 2001;**29**:1239-46.

Incidence of severe and fatal reactions to foods

Although the article by Macdougall *et al*¹ regarding the incidence of severe and fatal reactions to food would be seem to be reassuring, we would like to express some concerns and raise some questions about the data presented. The first question is whether the ascertainment of cases is really as complete as the authors suggest. We acknowledge that the UK medical system may allow better reporting and access to mortality data than that of the US. However, the records acquired as described seem to represent the same underreporting issues as those in the US. Is it really unlikely that the BPSU misses a significant number of cases? Based upon a well characterised population in Olmstead county Minnesota and extrapolating the data to a US population of 280 million, it may be estimated that there are 200 deaths from anaphylaxis reactions to food each year.²

A paper published in 2001, described methodology in which a National Registry had been established and was well publicised to US allergists.³ Very few reports were made by allergists and none by other physicians. No cases were initially reported by physicians who conduct research in food allergy. Nearly all the cases were ascertained from the press. These news articles appeared in local newspapers and were not reported in media with a large regional or national circulation. In an earlier effort to account for all cases of food anaphylaxis, only in Colorado, a significantly

Table 1 Performance characteristics of PCT, CRP, and PRISM score in 35 children with MSS

Severity index (%)	PCT	CRP	PRISM value	PRISM probability
Sensitivity	100	64	100	91
Specificity	63	46	63	83
Positive predictive value	55	35	55	71
Negative predictive value	100	46	100	95
Well classified	74	51	74	86