LETTERS TO THE EDITOR

Assessment of the grimace component of a coma scale

EDITOR,—While I applaud Tatman *et al*'s attempt to test James's modification of the Glasgow coma scale for use in intubated children,¹ I have some concerns about their study. First, as some of the observations are on the same child, and the attending nurse may have had some knowledge of the child's condition before the assessment, the observations are not independent and thus may not occur by chance (the basis of Cohen's κ). Second, Cohen's κ and weighted κ (derived from Cohen's κ) are sensitive to an unequal distribution of the marginal totals,³ which are present in this study. Third, the verbal and grimace scales were not performed on the same group of patients, further complicating the comparison. These factors, together with the lack of significance between the grimace and verbal scores, make it difficult to conclude that the grimace scale is more reliable than the verbal score.

I agree with the authors that the grimace and verbal scales may measure different cortical functions, but would add that age may influence the clinical significance of these scales. In the development of coma scales, I think classification of the response should be based on components that predict differences in outcome or detect physiologically important changes—for example, seizures—rather than fitting the number of categories in other scales. As the authors point out, reporting individual components is much more informative than summated scores. Furthermore, increasing the number of categories is likely to worsen the interobserver reliability.⁴ Finally, there should be some agreement about eliciting the response to a painful stimulus. Tatman *et al* appear to have used only nailbed pressure, while many clinicians in the UK and elsewhere apply supraorbital or sternal pressure. Thus, before we accept the grimace scale, it needs to undergo further interobserver studies, its sensitivity in detecting clinically important events and the relation between its components and outcome needs to be assessed.

C R J C NEWTON

Senior Lecturer in Paediatric Neurosciences and
International Child Health,
Institute of Child Health, London WC1N 2AP, UK

- 1 Tatman A, Warren A, Williams A, Powell JE, Whitehouse W. Development of a modified paediatric coma scale in intensive care clinical practice. *Arch Dis Child* 1997;77:519–22.
- 2 Fleiss JL. The measurement of interrater agreement. *Statistical methods of rates and proportions*. New York: Wiley, 1981:212–36.
- 3 Kupper LL, Hafner KB. On assessing interrater agreement for multiple attribute responses. *Biometrics* 1989;45:957–67.
- 4 Newton CRJC, Kirkham FJ, Johnston B, Marsh K. Inter-observer agreement of the assessment of coma scales and brainstem signs in non-traumatic coma. *Dev Med Child Neurol* 1995;37:807–13.

Drs Whitehouse and Powell comment:

We thank Dr Newton for making several pertinent points regarding the validity of our study. He highlights the problems of translating an ideal experimental design into everyday clinical practice.

Although some children were observed more than once, the observations were not necessarily interdependent. The coma state rather than the child was the unit of study. To reduce inpatient variation, a different nurse attended on each occasion and more than 24 hours elapsed between readings. Nowadays much research is undertaken alongside routine clinical care, and as procedures such as obtaining parental consent can take a great deal of time, using multiple readings per child is an attractive compromise.

While κ is theoretically sensitive to unequal distribution of the marginal totals (and to the number of categories), in clinical practice an even distribution of the coma states would rarely occur. Our distribution of coma states (shown in tables 3 and 4) may be similar to that of other paediatric intensive therapy units. We emphasise that the numerical values for κ should be broadly interpreted.

Verbal and grimace scores had to be carried out on different groups of patients because verbal scores cannot be measured in intubated patients.

A strength of our study is that it evaluates the child's Glasgow coma scale when used by routinely trained bedside nurses. These are the people relied on in clinical practice to perform, record, and act on changes in the child's coma state. We believe that, for nurses, nailbed pressure is easier to perform in a standard, reliable way than supraorbital pressure.

We look forward to further publications on the validation of this child's Glasgow coma scale, and our grimace scale in the future.

MEETINGS

1999

British Paediatric Neurology Association annual scientific meeting

8–10 January, Belfast

Further details: Dr David Webb, Consultant Paediatric Neurologist, Royal Belfast Children's Hospital, Grosvenor Road, Belfast BT12 6BE, UK

MRCP part II clinical course

6–7 February, London

Further details: Dr Colin Michie, Ealing Hospital, Uxbridge Road, London UB1 3HW, UK

5th International congress of tropical paediatrics

10–15 February, India

Further details: Dr Ashok Gupta, Secretary General, 25, Chetak Marg, M D Road, Jaipur-302 004, India

Fourth European postgraduate course in neonatal and paediatric intensive care

11–13 March, Bern, Switzerland

Further details: BBS Congress GmbH, PO Box 3000, Bern, Switzerland; tel: +41 31 331 8275; fax: +41 31 332 9879

Third international symposium on speech and language impairments

23–25 March, York

Further details: Carol Lingwood, AFASIC Symposium Secretariat, 29 Hove Park Villas, Hove BN3 6HH, UK

Royal College of Paediatrics and Child Health third spring meeting

13–16 April, University of York

Further details: Amanda Ambalu, RCPCH, 50 Hallam Street, London W1N 6DE, UK

Parenting positively: enhancing parenting skills

14–16 April, London

Further details: Kate O'Shea, Conference Department, The National Children's Bureau, 8 Wakley Street, London EC1V 7QE, UK

12th Paediatric dermatology course

13–14 May, Liverpool

Further details: Dr G Sharpe, Dermatology Unit, Department of Medicine, UCD Building, Liverpool L69 3GA, UK

Infection and immunity: an update

14 May, London

Further details: Dr Vas Novelli, Consultant in Paediatric Infectious Diseases, Great Ormond Street Children's Hospital, Great Ormond Street, London WC1N 3JH, UK

7th Annual neonatal conference

4–5 June, Middlesbrough

Further details: M Bruce, Conference Organiser, Postgraduate Centre, Education Centre, South Cleveland Hospital, Marton Road, Middlesbrough TS4 3BW, UK

First BDA international conference on multilingualism and dyslexia

17–19 June, Manchester

Further details: UMIST, PO Box 88, Sackville Street, Manchester M60 1QD, UK

European Academy of Childhood Disability (ECAD) 11th annual meeting

21–23 June, London

Further details: Professor B G R Neville, Neurosciences Unit, The Wolfson Centre, Mecklenburgh Square, London WC1N 2AP, UK

The Society for Pediatric Dermatology annual meeting

20–23 July, Crystal Mountain Resort, Thompsonville, Michigan, USA

Further details: Pat Fraser, 5422 North Bernard, Chicago, IL 60625, USA; tel: +1 773 583 9780; fax: +1 773 583 9765; email: Patrici107@aol.com

Second world congress of paediatric infectious diseases

2–6 November, Manila, Philippines

Further details: Ian Shepherd, Organising Secretariat, Second World Congress of Pediatric Infectious Diseases, c/o Esquema de Comunicación SA de CV, Insurgentes Sur 1722–601, Col Florida 01030, México DF, Mexico; tel: +52 5 661 7501; fax: +52 5 662 9964; email: esquema@internet.com.mx