A manual of neonatal intensive care, 4th edition


As an SHO, I bought the first edition of the Manual in 1982. It was a survival guide which provided safe certainties in the small hours of the night. It was small, light, and compact. There was no competition: the Roberton Manual was the book to have!

Nearly 20 years on, where has the 4th edition taken us? Bigger, certainly: a behemoth of a “small” manual with 550 pages. Not much taller or wider than its predecessors, but much thicker, the rather thin and closely typeset pages distinctly reminiscent of a Bible. Thirty four chapters and eight appendices. There’s an awful lot of information in here.

Road testing a book like this is quite a challenge. Clearly one should not ask it to perform in a manner for which it was not designed, and the authors helpfully explain in the preface that their aim “is to provide a guide for the management of the acute medical and surgical problems a resident is likely to encounter on a modern neonatal intensive care unit.” So I went for chapter 1, expecting it to plunge in where every resident is most nervous: resuscitation of the newborn.

Instead, I got “Organization of neonatal care.” Admittedly it is only six pages, but does a resident really need this in a practical manual? Especially since the big Roberton textbook is likely to be on hand in most neonatal units to provide this and much more detail on this subject. In the Manual, you have to wait until chapter 6 to get “Resuscitation”, with “Temperature control”, “Fluid & electrolytes”, “Enteral nutrition and parenteral nutrition”, all packed with science and terminology. How much physiology do you want or need in a practical manual? Not much, I think.

So I tried again with the oxygenation index (OI). There must be many units where the OI is used as a pragmatic threshold for giving nitric oxide or high frequency oscillation, and of course for referring for extracorporeal membrane oxygenation (ECMO). The resident will want to find the page with the formula for calculating OI, and how to deal with mm Hg versus kPa for the oxygen tension. To the index then—but no entry for oxygenation index. To the glossary of abbreviations at the front: there, sure enough, is OI. But where is it in the text? I could not find it under PPHN, or RDS, or ventilation. Eventually, by close reading, I found it mentioned under Meconium aspiration, and also under ECMO, but nowhere could I find the formula for calculating it. From this time, the luckless resident will have been called away to the next problem, and if the formula is indeed there, he/she will have lost interest in finding it.

Residents are increasingly likely to be faced with ventilators that read out the tidal volume and minute volume, and only pressure-volume curves. They want to know how to use this information. They want to know what to do when babies on trigger ventilation drop their Pco₂ to embarrassingly low levels. They want the formula for calculating the fractional excretion of sodium. They need to know that separate chest and abdomen radiographs give much better radiological information than “babygram” pictures. Sadly, they will be disappointed if they try to find such information in this book.

The 4th edition of the Manual seems to have lost the values of its roots. It feels like a pared down version of the big Roberton book, repackaged between smaller covers. It contains a level of detail that is unnecessary given the alternative sources of the material. It can be hard to find in a hurly the things you need, and some of the things you want are not there at all—or at any rate, I couldn’t find them. Admittedly it is only six pages, but expecting it to plunge in where every resident will have lost interest in finding it.

There was no competition: the Roberton Manual is a novel concept and a valuable addition to our literature. The book brings together a clinical biochemist, a neonatologist, and a medical microbiologist as authors in a successful attempt to describe appropriate laboratory investigation and clinical management of the neonate. This paperback aims to provide junior doctors, laboratory scientists, and neonatal nurses with background information that will help solve common neonatal problems. The chapters deal systematically with common biochemical and infective problems that may befall neonates. There are also sections on breastfeeding, parenteral nutrition, and therapeutics. Best of all it finishes with appendices including normal reference ranges and a useful glossary.

The expenditure of £30 rewards the reader with more than 300 pages which are clear and well arranged. Tables and flow diagrams are easy to dip into. More senior readers may feel that the book is not referenced, but recommended reading is provided at the end of each chapter.

Three small criticisms and suggestions for the next edition.

- The chapter entitled “Drugs and the neonate” is too short. The figure referring to biochemical and haematological monitoring cites only 11 drugs, ignoring commonly used drugs such as vecuronium, insulin, surfactant, salbutamol, 5-fluorocytosine, and steroids. Even those lucky 11 have curious omissions—for example, the oliguria and fluid retention associated with indomethacin.
- Secondly the book recurrently ignores the unusual demands of the extreme preterm infant—for example, dilutional exchange for polycythaemia is said to be carried out in 10 ml aliquots, and does not recommend smaller volumes when the newborn is under 500 g whose total blood volume may be little more than 40 ml.
- Thirdly the section on viral disease and transmission should be more detailed. “Low risk” is not quantitated, and CMV is described variously as “largely eliminated by freezing” and (one page later) “does not survive freezing”—an inconsistency that leaves the reader feeling insecure about such an important safety issue.

Nevertheless this is a volume that is informative and attractive, from the cartoon of a neonate’s head (front cover) to the photograph of the three distinguished and pathologically clever authors at the end. For all professional staff there are 300 pages of clear descriptions containing information that will prove useful in organising investigations in the neonatal unit. There are also modern data which can be used to defend the embalmed SHO against the soothing hands of the consultant ward round. Every neonatal unit should purchase a copy. I predict that these valuable pages will be well thumbed within a month. I look forward to a further edition, and hope that it will extend its scope to include other laboratory disciplines such as genetics and electrophysiology. The three authors deserve success with this winner.


Neonatology & laboratory medicine

M P Ward Platt
Neonatal Service, Royal Victoria Infirmary, Queen Victoria Road, Newcastle upon Tyne, NE1 4LP, UK; m.p.ward-platt@ncl.ac.uk

Fetal and neonatal brain injury: mechanisms, management and the risks of practice, 3rd edition

Edited by D K Stevenson, W E Benitz, P Sunshine. Cambridge: Cambridge University Press, £140.00, pp 926. ISBN 0521806917

Brain injury remains a common theme in a large proportion of survivors of extreme prematurity and/or neonatal encephalopathy. The headline rates of significant disability have been largely unchanged despite the enor- mous advances in neonatal intensive care of the post-surfactant era, and more subtle educational difficulties are later declared in many others. It is essential that clinicians continue to strive for a deeper understanding of the mechanisms of brain injury to not only guide conventional management, but also look ahead to the future strategies in which neuroscientific advances may translate into plausible clinical strategies—for example, promoting the regrowth of damaged axons and the survival of neurones across an area of periventricular leucomalacia.

The strength of a textbook such as this is to give an in depth overview of many aspects of brain injury. This is accomplished well by a distinguished list of mostly United States based contributors, who consider many aspects of neonatal brain injury in terms of aetiology, epidemiology, diagnosis, management, and...
Thickening milk feeds may cause necrotising enterocolitis

Extremely low birthweight infants have the highest risk of developing necrotising enterocolitis (NEC). We report on two infants who developed NEC while established on enteral feeds. A common antecedent was feeding of thickened infant formula with digestible carbohydrate: availability of calcium, iron, and zinc in vitro. J Pediatr Gastroenterol Nutr 2000;30:373–8.


Linear IgA bullous dermatosis in a neonate

We encountered a neonatal case of linear IgA bullous dermatosis. Only one other case of the disease diagnosed in the neonatal period has been reported, so we felt that it was important to describe this case.

Small vesicles first appeared on the face, hands, and legs of a Chinese full term baby on day 3 of life, which evolved into bullae on day 13. New bullae continued to erupt until day 18. By day 25, all the skin lesions had crusted, and skin healing was complete without scar formation. Besides skin erosion, the most overwhelming feature of the course was mucosal involvement. The infant presented with stridor on day 10 and went into respiratory failure requiring intubation. On day 30, bronchoscopy revealed a swollen larynx and a vesicle on the left ary-epiglottic fold. He was extubated on day 38 in the middle of a three week course of prednisolone. After extubation, stridor gradually subsided in a couple of weeks.

The diagnosis of linear IgA bullous dermatis was made by skin biopsy on a bulla. Histological sections showed splitting of the skin at the dermo-epidermal junction with predominant polymorph infiltrate. Immunofluorescence showed linear deposit of IgA at the dermo-epidermal junction. Staining for IgG and C3 was also positive.

Linear IgA in newborns occurs in childhood with onset from 6 months to 10 years. It classically runs a relapsing course with complete remission attained after puberty. The overall incidence of involvement of mucous membranes of the oral cavity, eyes, and external genitalia is 57%, 40%, and 72% respectively. However, the mucosal involvement is not life threatening.

The other neonatal case of linear IgA bullous disease reported in the literature also showed serious mucosal involvement. It manifested as respiratory failure requiring treatment by extracorporeal membrane oxygenation, oesophageal dysmotility with choking during feeding, and blindness as a result of conjunctival scarring. In both these neonatal cases, complete remission was attained after the unsettled neonatal period. Hence, linear IgA bullous disease with onset in the neonatal period contrasts sharply with the classical presentation of the childhood disease in having serious mucosal involvement and a non-relapsing course.

We hope that our report serves as a reference for neonatologists and dermatologists who may encounter similar cases in the future.

References


Vertical transmission of Citrobacter freundii

An infant developed early respiratory distress after delivery at 34 weeks gestation after prolonged rupture of membranes. Citrobacter freundii was cultured from a maternal mid-stream urine sample at delivery. C freundii, resistant to ampicillin but sensitive to gentamicin, cephalosporins, and ciprofloxacin, was isolated from neonatal blood cultures taken on admission. Gram negative rods were seen on microscopy of cerebral ventricular fluid, with no white cells and 730 red cells per high power field. CSF protein was 1.26 g/l and glucose 3.0 mmol/L, with blood glucose of 4.9 mmol/l. No organisms grew on CSF culture. Ampicillin and gentamicin were discontinued, and ciprofloxacin and cefotaxime started for a three week course. Serial cranial ultrasound and computed tomography scans showed no evidence of intracranial abscess or ventriculitis. At 1 year of age the infant is neurodevelopmentally normal.

Neonatal infection with Citrobacter species is usually acquired in a nosocomial fashion, and causes septicaemia, meningitis, and brain abscesses associated with a high morbidity and mortality. Eleven cases of vertically acquired Citrobacter koseri infection have been reported. However, the only previous report of vertical transmission of C freundii describes a 32 day old infant in whom the organism was identified from maternal high vaginal swab and infant gastric aspirate, but not from blood cultures. Neonatal septicaemia with meningitis, as in our patient, has not been described. C freundii differs from other organisms causing neonatal meningitis by being able to
replicate within brain capillary epithelium, perhaps accounting for the propensity of this organism for causing cerebral abscesses. However, including this case, this complication appears to be confined to late onset disease, with possible explanations being the early use of antibiotics, and absence of a putative virulence factor.

The combination of cefotaxime and an aminoglycoside is recommended for neonatal Gram negative meningitis, but CSF concentrations of gentamicin may only be marginally above the minimum bactericidal concentration of Gram negative organisms. Ciprofloxacin has been shown to be effective in Gram negative meningitis, and should be considered in the treatment of this condition.

T J Malpas, J J Munoz
Department of Paediatrics, The General Hospital, Jersey JE1 3QS, Channel Islands; t.malpas@gov.je

I Muscat
Department of Pathology, The General Hospital, Jersey

doi: 10.1136/adc.2003.043398

References

Recruitment failure in early neonatal research

Rates of neurodevelopmental handicap are high among extremely low birthweight survivors, and the first 48 postnatal hours probably give the greatest opportunity for preventing damage. However, at this time, families are in turmoil and may have difficulty in coming to terms with a small baby in intensive care. We recently had to abandon an observational, non-invasive study because of practical difficulties arising from the new Research Governance Framework,1 and we would like to share this experience, and its implications, with the research community.

We needed parental consent for the study, which had local research ethics committee approval. Babies had to be < 1500 g birth weight, > 25 weeks gestation, < 48 hours old, ventilated, with an arterial line, and no prior intervention for circulatory compromise. The last two requirements meant that, in reality, babies had to be recruited within the first 12 hours. A non-invasive measurement of peripheral oxygen consumption was to be made regularly over 24 hours. We aimed to recruit 50 babies over two years.

When an eligible baby was admitted, the parent(s) were given further information before consent was sought a minimum of four hours later. Parents in this group were given 24 hours to come to a decision. Figure 1 shows that, of 28 eligible babies, only five were recruited. Eight out of nine mothers approached antenatally gave consent, but only two of their babies were studied, as three did not meet the entry criteria and the other three were born elsewhere.

What went wrong? Since the Griffiths report,2 the emphasis has been on obtaining fully informed parental consent, and the research team has to ensure that the parents thoroughly understand the research and its implications. Research where parents signed consent forms, but later claimed that they did not understand the research, was heavily criticised. Consequently researchers are reluctant to approach parents who are in any way distressed, because of the difficulty in ensuring valid consent. If it is important for early neonatal research to continue, we urgently need agreement on a sensitive, humane, and realistic framework that is acceptable to both parents and clinical researchers alike.

S Nicklin, S A Spencer
Neonatal Unit, University Hospital North Staffordshire (NHS) Trust, Newcastle Road, Stoke on Trent ST4 6GG, UK; andy.spencer@uhns.nhs.uk
doi: 10.1136/adc.2003.043711

Gestational age in the literature

In neonatology, the correct gestational age (GA) is extremely important, as the viability and survival of the premature baby depend on it. A difference of a few hours or a day can have a substantial impact on the survival and long term morbidity of premature babies.

Doctors are trained to report the GA of a premature baby in exact days—for example, 26+4 (GA = 26 completed weeks and 4 days). Reporting the GA in this format helps in understanding and assessing the postnatal and maturational age of premature babies. One would therefore expect GA to be reported exactly in the literature, especially in articles, studies, and trials dealing with survival and morbidity in premature babies. In fact, descriptions of GA are extremely ambiguous in most articles. An example of this ambiguity is survival at 26 weeks GA is...
This page discusses several aspects of neonatal care, including the use of antibiotics, fever management, and the impact on survival and ethical issues. It also references a study on antibiotic use and fever in neonates, discussing the importance of empirical antibiotic use.

The page quotes a study by Carstairs et al. (2003) which found that 88% of neonates treated with antibiotics were not infected. The authors suggest that antibiotic use needs critical appraisal in the neonatal setting.

Another study by Carstairs et al. (2003) highlights the importance of home phototherapy in the United Kingdom, noting that it is a safe and effective treatment for newborn jaundice. The study also mentions the impact of home phototherapy on survival and viability.

Fever in the neonatal period is discussed, with a focus on the role of antibiotics in treatment. The page also references a study by Carstairs et al. (2003) which found that fever in neonates is often due to dehydration, highlighting the importance of proper hydration in newborns.

The page ends with a discussion on the importance of home phototherapy, emphasizing its role in the management of neonatal jaundice.

References

Additional references and information are available in the text, including studies on antibiotic use and fever in neonates, the importance of home phototherapy in the United Kingdom, and the role of antibiotics in neonatal care.

www.archdischild.com