

Book review: “Neonatology and Laboratory Medicine”

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BOOK REVIEWED

“Neonatology and Laboratory Medicine”

by Sarah Heap, Jim Gray, and Andrew Ewer

Editors: Helen Losty, Valerie Walker
Publisher: ACB Venture Publications,
for Association for Clinical Biochemistry
and Laboratory Medicine, UK
Published in 2017
3rd Edition; 271 pages
ISBN 978-0-902429-57-4
EAN 9780902429574

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RECENSION

The majority of newborns do not require laboratory testing apart from a blood sample for the neonatal screening programme. Nonetheless, this book fills an important niche with its comprehensive coverage of laboratory medicine for a distinct group of patients. Laboratory support is crucial in the management of sick newborns for a broad spectrum of clinical needs, from simple monitoring to the diagnosis of complex inherited disorders.

The opening chapter gives an overview of neonatal care and biochemistry. Approximately 11% of newborns admitted to the neonatal unit (NNU) in the UK are preterm. Besides undertaking actual analysis, the laboratory should be involved in the collection, transport and pre-analytical processing of samples. One of the major concerns of laboratory testing is the collection of samples from neonates, a topic that is adequately covered in this chapter, and in an appendix.

The second chapter deals with the requirements for laboratory services and related issues such as quality considerations. Point-of-care-testing (POCT) and the

factors deciding its use are discussed. Credit should be given to the authors for discussing ethical issues in the laboratory testing of neonates in this, and some other chapters.

Most of the remaining chapters cover the underlying pathophysiology of the clinical problems that are encountered in neonates and the interpretation of related laboratory results. Neonates, particularly premature infants, are vulnerable to disorders of electrolyte, water and acid-base metabolism and these are covered in two chapters. The common minor neonatal problems that require laboratory support are jaundice, hypoglycaemia and infection. The chapter on neonatal jaundice covers its pathophysiology and, *inter alia*, provides an algorithm for the investigation of prolonged jaundice. Blood glucose falls rapidly after birth but normalizes by 12 hours of life. Prolonged severe hypoglycaemia can result in death and brain damage and the causes of hypoglycaemia are extensively discussed.

Neonatal laboratory screening is undertaken in the UK, for nine inherited disorders, to identify infants who may be at high risk, for those who are treatable, before symptoms develop. An initial positive screening test is confirmed with specific second-tier diagnostic tests. The advent of rapid high throughput technologies and DNA analysis offer the potential to screen for numerous disorders but the expansion of newborn screening also raises ethical dilemmas and treatment issues. The chapter on Inherited Metabolic Diseases is the longest with 36 pages. Its coverage is wide-ranging with descriptions of the clinical and biochemical manifestations, and the investigations that need to be undertaken.

Haematology and the neonate are covered in a single chapter. Anaemia is a common disorder in neonates. Its causes and a useful diagnostic algorithm of the condition are provided. The

chapter also touches on most common disorders of the haemostatic system.

Infections can be acquired before, during and after birth. Babies in the NNU are at high risk. The chapter describes the common pathogens, epidemiology, clinical features, diagnosis and management of infections in neonates. The high incidence and mortality of neonatal sepsis worldwide require an earlier diagnosis and more accurate monitoring of the disease [1]. The definition of paediatric sepsis is a matter of controversy, and the conventional tests (WBC and differential count, micro-ESR and CRP) have limitations [2]. Newer molecular tests, the application of proteomics and metabolomics for risk stratification and prognosis, and the clinical use of matrix-assisted laser desorption ionization time-of-flight mass spectrometry (MALDI-TOF MS) for the identification of various bacteria and yeasts, are discussed. The availability of these sophisticated biochemical and molecular tests and of innovative technologies can significantly improve outcomes [1]. A separate chapter discusses the important topic of infection surveillance for prevention and control, and the management of outbreaks of infection.

Babies are not small adults and need their own reference intervals (RI). Although these are provided in this book, the authors have suggested that laboratories should establish their own RI. Since there are numerous challenges in trying to do so for children, it would have been helpful if the authors had addressed the ways this could be done.

The book consists of 15 chapters and 4 appendices. Each chapter begins with a "Summary" and ends with a list of references. Among attractive features of the book are the useful diagnostic algorithms, and tables/figures that conveniently summarize the main body of the text.

There are not many books that comprehensively cover all areas of laboratory medicine. For the

future, the authors have opined that closed, self-contained fully integrated platforms will allow testing to be carried out on demand and nearer to the patient. In microbiology, antibiotic resistance is likely to be one of the main challenges. Though most of the chapters of this book are on clinical biochemistry, there are also chapters on nutrition and drugs besides those on infections (microbiology) and haematology.

This excellent title has been updated from its previous edition to ensure continued relevance. While the authors modestly offer this book as a "basic guide for junior doctors, laboratory scientists and neonatal nurses," its appeal should

range much wider. In the preface, they enigmatically thank the publishers "for providing us with the opportunity for this *final* (my italics) edition." One must hope that there will be another update of this remarkable publication at the appropriate time.

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