Viral Haemorrhagic Fevers

By Colin R. Howard


This book is a small volume in the series "Perspectives in Medical Virology." It seeks to provide an overview of all of the viruses that have been associated with hemorrhagic disease. The chapters cover epidemiology, clinical disease, immunology and pathology, molecular virology, diagnosis, and all other aspects of the science and threat to public health of a disparate group of viral infections. A compendium of information of this kind is a useful concept for those who need an overview of and an introduction to the field of viral hemorrhagic fevers. The author has also added general chapters about safety and perspectives on bioterrorism, diagnostic techniques, vaccine development, and other topics. The early history of each viral disease discussed is well covered.

The author’s considerable background in molecular virology allows some useful, in-depth discussion of viral structure, replication, and functions of the various molecular components of viral hemorrhagic fevers. These discussions are mostly in text, and it would have greatly increased understanding (particularly for the general reader) to have had many more illustrations. The author is clearly less comfortable with epidemiology and ecology of the viruses; both topics are rather underserved by this book. For example, aerosol transmission of Lassa fever is discussed, even though this means of transmission has been excluded in most published articles. The importance of Marburg virus is dismissed, and the author fails to mention

the major outbreak that occurred in the Democratic Republic of Congo in the late 1990s. This omission is important in light of the major outbreak in Angola in 2004–2005. Also of much concern is the misnaming of countries. The Democratic Republic of Congo (formerly Zaire) is referred to as “Congo,” which has never been its name. Lack of attention to detail in this respect seems unnecessary and is unsettling.

In general, many of the concepts presented are dated and fail to address much of the most recent literature, which has changed and advanced the concepts presented in this book. In addition, there are many errors and unsubstantiated and unreferenced statements that are misleading, at best. For instance, ticks are described as breeding in stagnant pools, and nonhuman primate species are misnamed. Descriptions of human infection with White-water Arroyo virus are treated as fact but are unreferenced—for the excellent reason that definitive articles were never published, possibly because of inability to confirm the authenticity of isolation. Other articles that present irreproducible data, such as the report of reverse transcriptase activity associated with arenaviruses, are quoted uncritically. Disappointingly, even the section on diagnostic techniques is out of date. Today, RT-PCR is widely available, even in developing countries, so discussions about immunofluorescent antibody assays—the staple of diagnostic techniques during the 1970s and 1980s—being the primary approach are overemphasized to the detriment of newer approaches.

Even some sections that discuss molecular virology are seriously out of date, particularly those concerning filoviruses. Many major articles about filovirus that have been published during the past few years are not referenced; complete bodies of work from some of the current leading experts have been omitted. The problem of not including findings from the most recent literature are compounded when discussing pathophysiology (particularly, immunopathology). Much of what is discussed is limited to old articles about histopathology. The author states that cellular immunity is not important in Lassa virus infections, but it has been clearly shown for many years that immune protection is almost entirely T cell–dependent and that hyperimmune globulin is quite ineffective as treatment. Major advances in the understanding of the innate and acquired immune responses in Ebola virus infections are ignored.

This is a disappointing volume that could have been useful, but, because of inaccurate statements and the lack of up-to-date information, it is much less so.

Acknowledgments


Susan P. Fisher-Hoch
Division of Epidemiology, University of Texas School of Public Health at Brownsville, Brownsville, Texas

Foodborne Pathogens: Microbiology and Molecular Biology

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The aim of this book is to give a coherent review, as well as present a summary, of the latest advances in the field of microbiology and molecular biology of microbial agents that cause foodborne disease. The book contains 2 major sections. The first section covers general aspects, including pathogen detection (with molecular methods and biosensors), typing
methods, viable but nonculturable organisms, modeling of pathogens in food, and bacterial stress response. The second section covers specific microbial agents (except for the 2 final chapters, which discuss terrorism and the food supply and newly emerging or potentially emerging foodborne pathogens). It is stressed that the focus of the book is on basic microbiology and molecular biology, and there is limited information regarding the clinical aspects, epidemiology, risk assessment, and different approaches to the control of foodborne illness.

Several of the more general chapters will mainly be of interest to food microbiologists, because they include information about biosensor detection of pathogens, stress response of foodborne bacterial pathogens, nonculturable bacteria in food environments, and the modeling of pathogen behavior in foods. However, it is of interest to note that the exposure of microorganisms to sublethal physical or chemical stress, which is common in food processing technologies, may induce the adaptation of microorganisms to more-stringent stress events. The outcome is failure of these organisms to be eliminated from the food environment. It is stressed in several chapters that the ability of microorganisms to adapt and change plays an essential role in the emergence and re-emergence of foodborne pathogens. Hence, a basic understanding of modern food processing is needed to fully understand the epidemiology and control of foodborne diseases. The present book is a source of information for obtaining such an understanding. One of the important chapters provides an excellent review of modern typing methods. Naturally, the emphasis is on recent advances in molecular typing, but traditional methods are also mentioned. It is stressed that no single typing or fingerprinting method will be completely accurate or informative, and that, most often, a combination of methods should be used. It is also emphasized that the output from these methods cannot be looked at in isolation; the output should be examined in combination with epidemiological data when foodborne illnesses are investigated. The chapter on typing does not provide detailed advice regarding the interpretation of the typed data, but it provides an overview of most of the current approaches. Surprisingly, the use of antimicrobial susceptibility testing as a typing approach is not mentioned; many outbreaks of infection due to Salmonella species are initially identified by the increase in the number of diagnosed cases caused by a specific combination of serotype and resistance type.

Most of the specific chapters on microbial agents are concise, but some are more comprehensive and review aspects of detection methods and pathogenesis in detail. A particularly detailed chapter covers the chemistry, biology, ecology, and toxicology of foodborne mycotoxins. Several species of molds that produce mycotoxins grow in agricultural commodities, and potential diseases associated with mycotoxin exposure include tumors, gastrointestinal disturbances, alteration of the immune system, and reproductive problems. Additional chapters cover well-known foodborne bacterial agents, such as Campylobacter species, Salmonella species, Shigella species, Yersinia enterocolitica, diarrheagenic Escherichia coli, Vibrio species, Listeria monocytogenes, Clostridium botulinum, Clostridium perfringens, Bacillus cereus, and Staphylococcus aureus. Some chapters are well written and provide an excellent and quite detailed introduction to the material, including the chapters on Yersinia species and Listeria species. There are also sections covering foodborne and waterborne protozoan parasites and enteric viruses. In many industrialized countries, norovirus may now represent the most common cause of foodborne outbreaks. It is, thus, a surprise that only 3 pages of this book, which contains >450 pages, deal specifically with calicivirus.

In conclusion, this book is mainly targeted to food microbiologists, but it will also benefit specially interested clinical microbiologists or epidemiologists who need an update on the latest advances in the microbiology and molecular biology of microbial agents that cause foodborne disease.

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Kåre Melbæk
Statens Serum Institut, Copenhagen, Denmark

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