Differential Diagnosis and Treatment of Pediatric Allergy

Edited by
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Foreword

Allergists are certainly not self-effacing individuals. They constantly remind us of the staggering number of the American public, approximately thirty-five million, who suffer from all sorts of allergies. Obviously, the devastation resulting from the social, economic, emotional, and intellectual impact on those seriously afflicted is a source of concern. The cost involved in caring for the allergic sufferer is close to a billion dollars in the United States alone. More than two-thirds of the schooltime lost in this country is a direct consequence of upper respiratory tract insults, including asthma and other respiratory tract allergies. More than 5 percent of all children have asthma at some time during their childhood. In addition, it is no surprise that allergic disorders of all kinds, which tend to be chronic, adversely affect the quality of life of the patient and his immediate family. In fact, divorces in families with chronic illness, of which asthma is a typical example, have increased dramatically.

I can recall that I once took a jaundiced view of some of the basic concepts of allergic diseases and questioned the propriety of certain therapeutic modalities. Now, 15 years later, I remain a skeptic, but it is comforting to know that most allergists are as skeptical and self-questioning as I. Much has happened in this field over the past 15 years. For example, the conceptualization of asthma in terms of its pathophysiology, diagnosis, and management has dramatically altered. Today, the practitioner treating asthma has tools such as cromolyn, beclomethasone, and single-entity medications, including selective adrenergic agents and theophylline. In the not-too-distant future, other, newer agents such as anti-cholinergic, anti-SRS-S, and anti-alpha adrenergic drugs will undoubtedly be available. In other areas of practice, hereditary angioedema can now be readily detected and controlled; hypersensitivity pneumonitis and occupational asthma are now better understood; and newer methods for both diagnosis and treatment are available for some of these disorders. On the other hand, despite a better comprehension of its immune aberrations, atopic dermatitis remains an enigma. There are newer methods for standardization and modification of allergenic extracts; however, much remains to be accomplished in this area.

I think all of us would agree that we have been engulfed by an information explosion in basic immunological mechanisms. Sorting out the broad clinical implications of this complicated field is chiefly the task of dedicated researchers. Wisely, this book provides an overview of this complex subject.

Probably one of the most important contributions of this book is

its highly concise and practical identification of the differential diagnosis and treatment programs for the vast array of allergic disorders that can be managed by pediatricians and primary-care physicians. Equally important, the book identifies allergic problems that require the special skills of allergists and other specialists.

I previously alluded to the rapid advances that have occurred in allergy and immunology. However, one aspect of allergic disorders, which also applies to a variety of nonallergic chronic diseases, has not changed. There still exists a need for caring physicians who address themselves to the concerns and anxieties of the patient—the disabled allergic child—and the parents. Reassurance, comfort, kindness, and support are therapeutic tools that are as important as the treatment strategies outlined in this text.

The 1980s promise to be even more successful than past years in unlocking the mysteries of immunological mechanisms. It is certainly hoped that forthcoming information will provide an increasingly solid basis for understanding the multiple atopic disorders discussed in this text.

Sydney S. Gellis

Preface

This book is designed to provide a synoptic account of the current state of the art in childhood allergic diseases. It offers not only a practical, office-oriented approach to the unique and distinctive features of the wide spectrum of clinical allergic disorders but also highlights the various diseases that mimic allergy. It has not been our intent to offer an encyclopedic or "laundry-list" approach to these diverse allergic disorders. This type of information can readily be obtained in the many excellent standard textbooks of both allergy and pediatrics. We believe that this book should be viewed as a supplement to standard texts.

The book is arbitrarily divided into chapters emphasizing clinical material relevant to the various organ systems involved in allergic processes. In addition to organizing the contents of the book and verifying their accuracy, we chose to contribute several chapters of our own. For the other chapters, we enlisted physicians of acknowledged expertise to present their views. You may note that these positions differ at times from those taken in standard texts. However, it is our sincere belief that the reader should be exposed to differences of opinion, chiefly because appreciation of different viewpoints is likely to enhance learning. The book should not be seen as offering a precise syllabus of clinical treatment; nor should it be viewed as a major source of immunological theory and data or a means of settling controversial issues. Rather, it attempts to highlight the most appropriate methods for identifying various allergic disorders and to provide the basic concepts needed for managing the allergic child.

We have all been witness to an information explosion resulting from research on immunological mechanisms. It would be unrealistic for us to have undertaken a detailed account of the vast array of complex immunological mechanisms specifically involved in aberrations of the immune apparatus. Instead, we have chosen to approach the subject in the following way: In the first part of the book, we deal with the general principles of immunology and their practical application. After digesting this material, the primary-care physician should be able, we believe, to develop an effective strategy for a sequential, logical, cost-effective clinical and laboratory approach to identifying patients with immunological defects. Once such patients are identified they can be readily referred to an appropriate tertiary medical center. Subsequent chapters deal with the various allergic disorders on the basis of the organ systems.

Although the book was written with the primary-care physician

and pediatrician in mind, we believe that it will also be useful to medical students, nurse practitioners and others in primary paramedical specialties, and any physician interested in devoting part of his or her time to caring for children with allergic diseases.

Reference material was not meant to cover the entire field. In fact, we encouraged contributors to limit reference sources. Those interested in more detailed exploration of the material presented can refer to standard textbooks.

Obviously, in a book such as this there are omissions, some by intent, some resulting from editorial bias. Among such omissions are topics for which there was not an adequate number of controlled studies to substantiate anecdotal claims.

Because we wished to allow contributors some latitude in expressing their views, there are instances of overlap and repetition. It is our belief that repetition can sometimes be rewarding, since it serves to reinforce basic concepts that are essential for both the diagnosis and the management of childhood allergic disorders.

Obviously, it is our hope that the book includes sufficient information to familiarize the reader with significant advances that have taken place in the field during the past four or five years.

We would be remiss if we did not thank the many busy physicians who contributed chapters. We thank our secretaries, Naomi Podhorzer and Judith O'Rourke, not only for typing the manuscripts but for their calm patience under the pressure of deadlines. And finally, we would like to thank Eve Nichols, Lin Richter, Helane Manditch-Prottas, and Elizabeth Welch, who were sources of much help, providing editorial expertise whenever or wherever it was required.

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Contents

1. A Unifying Model for Immunological Processes

Joseph A. Bellanti and Ildy M. Katona

The relationship of immunology to allergy was recognized at the turn of the century when von Pirquet put forward a hypothesis to explain the extreme versatility and complexity of the immune response. He coined the term *allergy* to include two kinds of "changed reactivity"; one type he labeled *immunity*, the other *hypersensitivity*. Von Pirquet made no distinction between the beneficial and the harmful expressions of the immune response and suggested that they were all manifestations of a common biologic process of sensitization that he encompassed by the term *allergy*. Little did he realize the significance of his proposition nor would he recognize today our reversal of his terms. Ironically, over the years the term *immunity* has come to mean that which von Pirquet defined originally as "allergy," and *allergy* has come to mean "hypersensitivity." Nonetheless, the interrelationships of immunity and allergy are still understood to be as von Pirquet proposed in his broad definition of the immune response.

Over the past ten years the discipline of immunology has undergone a great renaissance, and it has become increasingly apparent that the protective function of the immunological response is only part of a much broader reactivity concerned with the recognition and disposal of foreignness. The immune response is impartial in its dealings with foreignness and rejects whatever materials it recognizes as "non-self," ranging from such diverse substances as transplanted organs to ragweed pollen. Immunology is assuming increasing importance for physicians who specialize in the management of hypersensitivity-related disorders. The knowledge, skill, and understanding related to the proper use and interpretation of diagnostic procedures such as skin testing, as well as the various methods of therapy, are based in large measure upon immunological principles and mechanisms. The purpose of this chapter is to present a broad overview of the immunological processes and their relationship to allergy.

COMPONENTS OF THE IMMUNOLOGICAL SYSTEM

For ease of discussion we may speak of five components in the host's encounter with foreignness: (1) the environment, (2) the target cell, (3) the phagocytic cells, (4) the mediator cells and their products (mediators), and (5) the specific antigen recognition cells