Immunological Aspects of Neurological Diseases

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Foreword

One of the most dramatic areas of medical progress in recent years has been in the field of immunology. The authors of the present book have wisely limited themselves to one important aspect of immunology - that of neuro-immunology. In an increasing number of diseases of the nervous system of hitherto unknown cause, immunological changes have been demonstrated. These may clearly have pathogenetic and therapeutic significance.

This book represents a notable effort in bridging the gap between the basic aspects of immunology and its application in clinical neurology. The authors are particularly well suited for the task, having a solid foundation in basic immunology as well as in clinical medicine. The result is a concise, lucid and authoritative introduction to the field of neuro-immunology.

Their book, based on their extensive personal research and on a critical review of the pertinent literature, will, therefore, be of value to neurologists as well as to all others interested in the subject of neuro-immunology.

Sigvald Refsum

Preface

Our understanding of the nervous system and how it operates in health and disease has undergone a radical development during the past few decades. This is mainly due to the application of the basic sciences to neurology. The advances in physiology, biochemistry and immunology have elucidated the pathogenesis of several neurological disorders and led to effective treatment. Many diseases in the nervous system have been the subject of immunological
research. The increased knowledge within neuro-immunology has had a tremendous impact upon, clinical neurology, which for a long time was only a descriptive discipline of clinical medicine.

An insight in immunological concepts and techniques related to clinical problems has become imperative for clinical neurologists. This book is therefore mainly intended for the clinician. It is assumed that the reader is familiar with symptoms and signs of the diseases discussed. In most clinical investigations, the application of immunology must be team-work. Specialists in other fields, such as immunology, virology, bacteriology, pathology and biochemistry involved in neuro-immunologic research need therefore information of the clinical aspects of the diseases under investigation. Brief descriptions of the essential traits of the symptoms are therefore included.

An understanding of the development in neuro-immunology requires knowledge of general immunology. The first chapter of this book gives a brief account of the biology of the immune response and of the immunological techniques employed in neuro-immunology. A summary of the relation between the brain and the immune system is also included. The vulnerability of the brain makes this organ more difficult to investigate than most other organs. This has hampered clinical investigations in neurology. Some diseases with marked similarities with human diseases can easily be induced in animals. The studies of these model diseases has given valuable information also for the physician.

The chapter on infectious diseases of the nervous system gives only a brief account summarizing the disease mechanisms in some essential infections.

This is because the aetiology, pathogenesis and immune response are now well characterized in many infectious processes. An exception is the slow virus infections, an area under intensive investigation. Recent knowledge has changed our concepts on obscure degenerative diseases of the brain. The role of immune factors in many of these diseases is, however, still uncertain.

Two diseases stand out as central targets for neuro-immunological research - multiple sclerosis and myasthenia gravis. A great deal of literature has accumulated in these fields. The chapters on those two diseases survey the various directions in the immunological research, including recent references and reviews.

There are several other neurological diseases where immunological mechanisms are apparently active. Our knowledge of how these mechanisms function is still fragmentary. The chapters on epilepsy and diseases of the
basal ganglia are more detailed because there are few reviews covering these areas.

Neuro-immunology is still in its infancy. We have tried to outline the present status of the different lines of research. Some of these may turn out to be wrong. New results may totally reform our concept of immunological diseases of the nervous system. We do not know whether immune mechanisms are of physiological importance. It is therefore difficult to interpret the meaning of several of the immunological parameters encountered in neurological diseases.

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