Rostrum

Recognition of clinical immunology as a distinct medical subspecialty: Importance for the practice of allergy

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Background: Although residents trained in accredited teaching programs in allergy and immunology are exposed to many areas of clinical immunology, the vast majority of these residents' subsequent practices are composed of caring for patients with allergic and asthmatic conditions. Except for rheumatologists, almost all other clinical immunologists appear to lack organized training programs, defined certification pathways, and clear career opportunities.
Objective: Recognition of clinical immunology as a distinct medical subspecialty with many areas of expertise will enhance the image of allergists and clinical immunologists, ensure subspecialty certification, and provide better career opportunities.
Methods: Documents, publications, and private opinions of individuals within professional allergy and clinical immunology organizations were evaluated for possible contribution to the subject content of this article.
Results: There is a need for defined residency programs, medical board certification, and professional organizations that speak for and provide postgraduate education for all clinical immunologists. Molecular and genetic discoveries are delineating the central role of fundamental immunology in all immune-mediated diseases and future therapy of allergic and immunologic diseases.
Conclusions:Allergists of the 21st century should participate in the growing recognition of clinical immunology as an important medical subspecialty that can provide science-based therapies for allergic and immunologic disorders. The future practice of allergy depends largely on the molecular and genetic discoveries that serve to unite all practitioners of clinical immunology. Forging common alliances of education, certification, and career pathways with other clinical immunologists is the correct investment for a bright future for allergy. (J Allergy Clin Immunol 2002;110:567-70.)

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Clinical immunology is defined as a subspecialty of medicine that deals with numerous immunologic aspects of many diseases and with diseases of the immune system itself. The current practice of that part of clinical immunology known as allergy is considered by the lay public and even by allergists themselves as a medical practice that deals with immediate reactions to natural or man-made substances that are unpleasant and occasionally life-threatening. Allergic disease is common, affecting between 5% and 30% of the general population,[1] but because most of its manifestations do not impair a normal life span and many patients with allergic diseases are cared for by medical generalists, the number of subspecialists devoting their careers to its treatment are relatively few (eg, 194 candidate allergist-immunologists certified in the 2-year period from 1999-2001 vs about 14,000 internists certified in the same time interval).[2] Another part of clinical immunology that engages a similarly small number of subspecialists is rheumatology (eg, 210 candidates certified in the same 2-year period). Perhaps the greatest number of clinical immunologists, those dealing with numerous other manifestations of immunologic disease involving immunoregulation, immunogenetics, immunotherapy, and immunodiagnostics, have no clinical immunology subspecialty designation. An example of such an individual would be a gastroenterologist in internal medicine who further specializes in mucosal immunology or a diabetologist concerned with pancreatic island transplantation.

This review will evaluate the need for the recognition of clinical immunology as a distinct medical subspecialty and will attempt to predict how the growing importance of clinical immunology will enrich the practice of allergy and the professional lives of allergists.

TRAINING OF ALLERGISTS

The training of clinical immunologists has been the mold for these subspecialty identifications. Allergists and rheumatologists have been trained in programs accredited by the Accreditation Council for Graduate Medical Education, whereas other clinical immunologists have trained in programs that are not accredited. Many of these clinical immunology training programs lack formal structure and include a heavy component of research. In many programs the training of allergists has retained the old apprentice-

Abbreviations used
ABAI: American Board of Allergy and Immunology
ABIM: American Board of Internal Medicine
CIS: Clinical Immunology Society
FOCIS: Federation of Clinical Immunology Societies
TPD: Training Program Director

type education, with young physicians being taught by physicians in practice, for far longer than any other medical subspecialty.[3] Until relatively recently, some major medical teaching institutions have been content to permit the education of allergists in training to be directed by volunteer staff allergists at their private practices. Much of this problem of a lack of medical institutional commitment to allergy-immunology training stems from the lack of appreciation by medical institutions of the rigorous scientific principles of immunology that govern the expression of allergic disease. Attempts to capture and incorporate the knowledge of immunology into the discipline began in 1971, when the conjoint American Board of Allergy and Immunology (ABAI) was formed by the 2 separate subspecialty boards of allergy of the American Board of Internal Medicine (ABIM) and the American Board of Pediatrics.[4] This development took place at the same time that the immunologic components of allergic responses (eg, IgE molecule, mast cells, and mediators) were being discovered.[5] At that time, distinguished immunologists, such as K. Frank Austen, Kurt J. Bloch, and Rebecca H. Buckley, recognized the important need to incorporate the expertise of physicians who practiced the nonallergy form of clinical immunology into the then newly formed discipline of allergy and immunology.[6] Accordingly, the content outline of subjects to be covered by the ABAI certifying examination extended far beyond the customary preview of the topics of allergy and allergic asthma emphasized previously. Although the emphasis of clinical immunology was stressed, the principal practice area remained allergy and asthma for most community allergists, with some practice of primary and secondary immunodeficiency by allergists located at universities. This intention of increasing the clinical immunology component of the training programs for allergy and immunology extended to the creation of a third year of training for certification in diagnostic laboratory immunology and later to a revised certification pathway in clinical and laboratory immunology, with the award of a certificate of added qualification on successful completion of a certifying examination.[7]

EMPHASIS ON CLINICAL IMMUNOLOGY FOR THE FUTURE PRACTICE OF ALLERGY

Within the last 15 years, the Training Program Directors (TPD) Committee of the American Academy of Allergy, Asthma and Immunology has been a principal force in placing more of the content of clinical immunology into the curriculum of residents training in allergy and immunology.[7-9] Facing the restrictions of managed care reforms, the TPD Committee issued several position statements on the importance of trainees acquiring skills and expertise beyond those that deal just with allergic and asthmatic disease to remain expert consultants in the medical community and to be able to participate in reimbursement mechanisms of managed care.[10]

This important distinction of becoming a mechanism-based subspecialty, rather than a target organ–based subspecialty, has been eloquently described by Robert R. Rich in his prophetic statements on the future of clinical immunology.[11-14] The essence of Rich's thesis was that a database of knowledge in all aspects of clinical immunology would best serve and ensure the survival of the allergist of the future. Although some have challenged this view, the TPD Committee has strengthened the clinical immunology content of the core content outline of the allergy and immunology training programs, and the ABAI certifying examination increasingly reflects this emphasis on a broader knowledge base in clinical immunology for its candidates.[15]

Despite these trends in the education and examination of trainees in allergy and immunology, there has not been a general increase in residents opting for the third year of training in clinical and laboratory immunology.[16] Part of the decline in interest in additional training was due to the general decline in subspecialty training itself in the mid-1980s and early 1990s, as seen in the decline in numbers of certified subspecialists in allergy and immunology.[2] Also contributing to the 20% to 25% decline in the number of certified subspecialists in clinical immunology was the decrease in the number of training programs in clinical and laboratory immunology. But perhaps the most important reason for the fall-off in interest in the clinical and laboratory immunology pathway was the fact that the original intent of this extra certification was to certify directors of clinical and diagnostic immunology laboratories, and this intention was never realized.[6] Because managed care reform centralized almost all clinical testing laboratories in medicine, there was no market for clinical immunology laboratory directors, and the extra year of training had no perceived reward. Meanwhile, in another area of clinical immunology, rheumatology certifications experienced a similar but smaller decline.[16] Unspoken for in these tabulations of certified subspecialists are the hundreds, if not thousands, of nonallergy, nonrheumatology clinical immunologists who have no mechanism for certification. These other clinical immunologists are typically found in departments of medicine, pediatrics, surgery, ophthalmology, and dermatology. Such persons could possess primary certification in medicine, for example, with secondary certification in endocrinology. This person would be interested in the immunology of diabetes mellitus and would be training other clinical immunologists as clinician-investigators. There are also cadres of clinical immunologists holding the PhD degree, who direct diagnostic clinical or research immunology laboratories. These nonmedical professionals make a very strong contribution to the laboratory aspects of clinical immunology.

RESURGENCE OF PROFESSIONAL CLINICAL IMMUNOLOGY SOCIETIES

There has been a resurgence in interest in clinical immunology and in a new certification pathway, as measured by the numbers of individuals attending the first 2 Federation of Clinical Immunology Societies (FOCIS) conferences held in Boston in May 2001 and San Francisco in June 2002. Organized by C. Garrison Fathman, David A. Hafler, and the Executive Committee of the Clinical Immunology Society (CIS) as meetings at which clinical immunologists in traditional and nontraditional careers could share ideas and expertise, the first meeting attracted nearly 1000 and the second meeting nearly 1300 clinicians, clinician-researchers, and researchers from over 20 professional societies and organizations with a common interest in clinical immunology. Special interests of these groups were allergy, asthma, transplantation, multiple sclerosis, Crohn's disease and ulcerative colitis, cytokines, neuroimmunology, congenital and acquired immunodeficiency, dermatology, rheumatology, histocompatibility, immunogenetics, uveitis, diabetes, and mucosal immunology. A great number of these meeting attendees expressed an interest in a certification pathway for this disease form of clinical immunology. When these individuals and members of the CIS were polled for their opinions on the mechanism of obtaining certification, a number of interesting observations were made. The most important of these was the 70% favorable response to the proposal to initiate a new certification pathway for clinical immunologists that would enable nonallergy, nonrheumatology clinical immunologists to obtain subspecialty certification by an approved medical specialty board. The easiest pathway for this purpose would be to use the remnants of the existing ABAI pathway in Clinical and Laboratory Immunology that would be modified to incorporate leadership from nonallergy and immunology training backgrounds into the leadership ranks and increase participation by additional medical boards, along with the present ABAI, ABIM, and American Board of Pediatrics. Specialists and subspecialists in several areas of medicine involving the practice of clinical immunology would be able to obtain another year of subspecialty training in clinical immunology and be qualified to take a certifying examination in clinical immunology.

A more comprehensive pathway for certification of clinical immunologists would be to create a separate pathway attached to one or more of the primary medical boards (ie, medicine, pediatrics, surgery, dermatology, and pathology). This would require approval of the American Board of Medical Specialties and creation of new residency training programs accredited by the Accreditation Council for Graduate Medical Education. Medical school commitment to the support of such programs would be necessary, but the participation of 2 or more departments would spread out the cost of developing and maintaining the clinical immunology training programs. An example of how this new pathway to certification in clinical immunology could take place would be for the ABIM to designate clinical immunology as a subspecialty with a requirement of at least 1 year of residency beyond the initial 3 years of residency in medicine and 2 years of subspecialty training (eg, endocrinology). This newly formed subspecialty board in clinical immunology would administer certifying examinations to graduates of the residency programs in clinical immunology, and during the first few years of its existence, it would also administer examinations to candidates with sufficient prior history of training in clinical immunology (grandfather mechanism). Ideally, because the current spectrum of clinical immunologists includes internists, pediatricians, dermatologists, pathologists, and surgeons, the subspecialty of clinical immunology could be approached by residents from several disciplines in a multidepartmental training program. Although trained in a common program, on completion of the certifying examination prepared by representatives from all primary specialties, the certification could be issued by the resident's primary medical board.

Considerable effort would need to be exerted by the leadership within the ranks of clinical immunologists (eg, CIS and FOCIS) to effect this creation of a modified or new certification pathway in clinical immunology, but the movement within the CIS and FOCIS is toward certification of its members. As opportunities are created for more clinical immunologists, it is essential that the needs of these subspecialists be met in the creation of their own certification pathway. Because the membership of the supporting organizations of FOCIS numbers greater than 20,000, a substantial number of clinical immunologists could be seeking certification.

FUTURE TREATMENTS IN ALLERGY TO BE SHAPED BY DEVELOPMENTS IN CLINICAL IMMUNOLOGY

One of the treatment practices of allergists that both identifies them as belonging to a unique set of clinical immunologists but has often given them an equivocal reputation is the 100-year-old practice of allergen injection therapy, frequently trivialized as "allergy shot therapy."[17] For the most part, this practice has not been well standardized with regard to the allergen content of injections, the method of administration, and the diagnostic criteria for its use, although several attempts have been made to do so.[18] The recent decision for Medicare to reduce reimbursement (ie, to the cost of undiluted extracts) to physicians for this treatment has led many to predict its gradual discontinuation as more third-party payers reduce reimbursements. A paradox facing the graduates of the allergy and immunology training programs is that when they leave the university, they have the skills and expertise to treat numerous types of immunologic diseases, yet on entering private practice with older allergists, they must often quickly conform to a dated system of allergen injection therapy for the majority of their patients, many of whom have not had adequate initial evaluation and subsequent review of the

continuing need for this mode of therapy. In the opinion of many, this conformation to often dated practices has had an adverse effect on the well-prepared young allergist, who soon loses the perspective of hypothesis-driven and peer-reviewed clinical research acquired in training and earns the criticism of peers in other subspecialties in medicine. The rescue of the plight of young allergists is the advancement of clinical research trials that are yielding better therapeutic and immunologic agents that will preempt much of the need for the traditional administration of allergens. Nonsedating antihistamines, inhaled and nasal corticosteroids, inhaled selective β-agonists, oral inhibitors of lipoxygenase products of arachidonic acid, nasal allergen therapy, systemic allergen vaccines with nucleotide boosters, systemic mAbs specific for IgE in general, or IgE antibodies all offer great promise to the allergist trained to face the future with this new therapeutic armamentarium.[19] It is this well-prepared allergist who will be able to carry on a growing and rewarding practice as older modalities of treatment are relinquished for the newer and more selective means of treatment.[16]

In addition to better preparing allergists for a career in practice, inclusion of a wider spectrum of clinical immunology into the training programs will also provide the opportunity for allergists to enter several other career choices, including those nontraditional careers in the biotechnology and pharmaceutical industries, careers in government research, and practice careers. Already these opportunities are attracting trainees of traditional programs in allergy and immunology and rheumatology and trainees of the many nontraditional programs in clinical immunology. The more expertise and knowledge in basic and clinical immunology that individuals can bring to these opportunities, the better able they will be to succeed in the new future of clinical immunology, which includes the practice of allergy. An example of such a new career path for newly matriculated allergists would be that of the graduate who immediately enters the biotechnology field with a company that specializes in DNA vaccines for chronic viral infections, such as HIV-1 or hepatitis C infection. This individual could be devising, within just a few years, phase I (dosage and safety), II (antiviral effects), and even III (efficacy) studies in the United States or in countries around the world. Alternately, the allergist with suitable laboratory interest could become involved in vaccine development within the basic science facilities of the company and could soon be collaborating with leading scientists at major universities. Government institutions are also looking for newly trained allergists with a firm background in clinical immunology. The National Institutes of Health, the Centers for Disease Control and Prevention, and many state departments of health are offering recent graduates in allergy and immunology funding for rewarding careers in clinically related basic research, immunotherapy trials, and epidemiology to cite a few examples.

SUMMARY

The spectacular advances in cell biology, genetics, and molecular immunology are revolutionizing the practice of all subspecialties in medicine, particularly that of clinical immunology. The growing realization that clinical immunology encompasses allergy, as well as many diverse areas of medicine linked to the human immune response, is uniting the previously separated practitioners of clinical immunology and forging common alliances of education, certification, and career pathways. The allergists and clinical immunologists of the 21st century will continue to gain the respect of university departments and professional organizations as their practices reflect more of the scientific principals of clinical immunology. The opportunities of newly graduated allergists are unlimited in research, teaching, and clinical practice, and the potential for satisfying careers has never been better. Let the good times roll!

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