The Evolution of Alzheimer's Disease

Alan J. Lerner, MD, Robert P. Friedland, MD
The Evolution of Alzheimer’s Disease


There can be no doubt that Alzheimer’s disease (AD) has entered the public domain. In this development, it has gone through a process similar to a biological evolution, indeed an evolution analogous to that which occurs in the development of AD itself. The media currently bear a steady succession of “research announcements,” frequently proclaiming “breakthroughs.” These pronouncements have recently involved identification of new genetic bases for AD, and the finding of a novel protein, “factoids,” never to be heard from again by the general public. On occasion, one encounters material of a stronger variety, such as the chromosome 1 and 14 mutations and the emerging Apolipoprotein E story. In such cases, we may think of an information nucleus capable of crystallization, a self-replicating unit. It is from these nuclei that scientists and hence the public build up an overall picture of AD, a story to tell ourselves to make sense of this tragic and frightening illness. In this regard, one can compare the deposition of amyloid Beta (Aβ), the presumed toxic molecule in AD, to the evolution of our state of knowledge. As postulated by Gadjusek (1994), the process begins with the production and deposition of single molecules, which may remain in soluble forms and be metabolized. At some point, however, the process becomes irreversible, and Aβ aggregates into a β-pleated sheet, contributing to cell death and neuritic plaque formation. This process has toxic implications for the afflicted organism, resulting in the entity we view as “Alzheimer’s disease.”

It is naive to think of AD in unidimensional terms. The concept of AD has broadened over the past decade, so that it is no longer merely a disease of inevitable decline, but is conceptualized as a complex of complicated interactions among a diseased brain, an aging individual, and his/her genetics, family networks, and community resources. Thus, in looking for disease models for AD, one thinks of broad categories of disease such as atherosclerosis and cancer.

For professionals working in the AD field, whether as geriatricians or other physicians, social workers, psychologists, or nurses, access to information is critical. While we scurry to keep up with the latest press releases, we need to have other resources to place the ‘discoveries’ in perspective of previous knowledge. Our own professional evolution has come to rely on exploring information in these domains, from the internet and other online services (MEDLINE, for example), to journal articles and books.

Several excellent chapters provide detailed and authoritative discussion of the neuropsychology of the secondary dementias, including HIV infection, alcoholic dementia, brain tumors, frontal lobe dementia, Huntington’s disease, normal pressure hydrocephalus, Parkinson’s disease, solvent encephalopathy, toxic/metabolic disorders, vascular dementias, and leukoencephalopathies. What makes this book especially useful is the last two sections, including an excellent review of brain imaging, including positron emission tomography, single photon emission...
computed tomography, and magnetic resonance imaging as well as electrophysiology. This is a rapidly evolving field, and this text cannot be relied upon for review of newer modalities such as functional magnetic resonance imaging. The final section of the text covers management of AD. While this section should not be a primary source, the chapters are good reviews of psychosocial evaluation, pharmacological treatment, and legal, financial, and ethical issues in AD.

Stress Effects on Family Caregivers of Alzheimer's Patients, edited by Enid Light, George Niederehe, and Barry D. Lebowitz, is the proceedings of a conference held in March 1990. In the first part, studies on caregiver stress are reviewed, including mental health, immune functions, and neuroendocrine parameters. Other sections of the book cover material more broadly related to the investigation of caregiving in its social, cultural, and economic perspectives. Models and theoretical issues in caregiving and caregiving research are thoroughly reviewed. Despite the long lag time from conference to publication, the volume is an important starting point for those interested in the academic issues of caregiving, and in development of caregiving interventions in dementia. Readers more interested in models of stress, particularly as related to neuroendocrine and immune functions, may want to consult texts more specifically oriented to issues in stress research.

In Alzheimer's Disease: Broken Connections, Liduin Souren and Emile Franssen have produced two volumes intended for the primary caregiver of the Alzheimer patient. The first part is Origin and Course—The World of the Patient, and the second is Practical Guidelines for Caring for the Alzheimer Patient. The first volume deals with basic concepts about AD, including an overview of dementia, and chapters on changes in behavior, activities, the sensory-motor system, and phases in caregiving. The major theoretical base for the text is the recasting of development in reverse. This notion, however intuitive and widespread in our culture, fails to account for the diversity of human behaviors in aging. Also, the focal nature of dementia symptoms, such as aphasia, makes comparisons with normal language development and regression strained.

Part one of the second volume may be somewhat frightening to a new or prospective caregiver. It veers into detail on neurochemistry and then, on several occasions, back to models of behavior. Early in the book the authors assert that the patient “...can continue to live for years as a hothouse plant” (Vol. 1, p. 39). Although the details of AD need to be explained to the patient and the caregiver, such statements are inappropriate. In contrast to part one, part two is structured and practical in its advice. The material is presented mainly in tabular form, arranged by disease stage. The book is useful for health professionals and social workers in advising caregivers about patient functions and limitations. The section on legal and financial affairs as issues in early caregiving is given good coverage, as this is frequently an important issue of patient autonomy, and much planning for caregiving is also based on this vital area.

For those interested in AD treatment, the small volume on drug development by Neal R. Cutler, John J. Sramek, and Amy E. Veroff makes interesting reading. Clearly intended as a specialty text, Alzheimer's Disease: Optimizing Drug Development covers the subject from both a theoretical and practical perspective. Later chapters transcend AD, and discuss issues particularly relevant to geriatric pharmacology, including subject selection and sample size, age as a factor in drug development and dose finding. The authors use their own drug development experience as a guide to the issues of clinical drug trials.

These books reflect well the evolution of Alzheimer’s disease as well as the disease’s broad concerns. We look forward eagerly to the next generation of Alzheimer volumes describing mechanisms of interference with Aβ production, aggregation, deposition and toxicity, and thus the extinction of the disease.

Alan J. Lerner, MD
Assistant Professor of Neurology
School of Medicine
Case Western Reserve University
Cleveland, OH 44106
E-mail: aij3@po.cwru.edu

Robert P. Friedland, MD
Associate Professor of Neurology
School of Medicine
Case Western Reserve University
Cleveland, OH 44106
E-mail: rpf2@po.cwru.edu

*Address correspondence to Dr. Friedland

Reference

GETTING BEYOND CURE: THE RETURN OF COMPASSION


Individualized Dementia Care: Creative, Compassionate Approaches, by Joanne Rader. Springer Publishing, New York, 1995, 298 pp., $37.95 (cloth).


The momentous changes in the health arena, including recognition of the need to move from the acute model where cure is central to a more humane system where care is central, are profoundly affecting elderly persons and their health services. Literature on long-term care until now has focused predominantly on chronic diseases, caregiver burden, and prohibitive cost. Recent contributions, however, particularly the books reviewed in this essay, reflect and document the newfound change in vision and provide insights and strategies to help health care professionals move beyond cure and return to compassion.

In this century, science and medicine, focusing on cure,