Clinical Pharmacology in Research, Teaching and Health Care

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Darrell R. Abernethy, MD, PhD

Geriatric Clinical Pharmacology

The most rapidly expanding age group world-wide are those 80 years and older (UN Doc ST/ESA/SER.A/207, 2001). Multiple concurrent illnesses that may benefit from drug treatment are the rule, not the exception, in this group. The likelihood of adverse drug reactions increases markedly as the number of concurrently administered drugs increases. This combined with the age-related decline in physiological functions (decreased cardiac reserve, impaired baroreflex function, decreased immunological response, decreased renal function) that in younger patients may be protective from severity of an adverse drug reaction make the older patient particularly at risk for polypharmacy related adverse drug reaction (Abernethy, 2007). However the benefits for treatment of hypertension, coronary artery disease, congestive heart failure, diabetes, arthritis, and other chronic illnesses associated with advancing age are well established. Clinical pharmacologists who focus their research, teaching and clinical service toward older individuals have the opportunity to improve RUD for this increasingly important segment of the world’s population.

During the past 30 years clinical pharmacologists have conducted the research that has defined the pharmacokinetics of aging (Klotz, 2009). This work, particularly in the area of drugs that undergo renal clearance, has contributed importantly to patient safety and well being. Looking to the future, the research opportunities to define drug pharmacodynamics and altered drug risk/benefit relationships in older patients are abundant. Similarly, teaching RUD for older patients and placing this into a geriatric medicine perspective is an important role for the clinical pharmacologist. The number of physicians trained as geriatric clinical pharmacologists is inadequate to meet either the research or educational needs, and attracting physicians and training them to do geriatric clinical pharmacology is a continuing challenge.

Clinical pharmacology has an important role to foster the linkage of the principles of geriatric medicine and disease-based therapeutics. In geriatric medicine advances in understanding the interplay of multiple concurrent illnesses and how this may result in a common path to patient disability and death has allowed definition of the frailty syndrome (Fried et al, 2001). In addition, the concept of competing morbidity, such that in the older patient successful treatment of one illness may result not in restoration of health, rather in the more obvious clinical presentation of another concurrent illness, has advanced clinical decision making and end of life care. The clinical pharmacologist has an important role in teaching the changing balance of risk and benefit for specific drug therapy intervention in the context of the individual older patient and their specific concurrent illnesses. The research opportunities in this area for the clinical pharmacologist are both challenging and exciting.

Disease-based therapeutics focuses on the development and implementation of treatment guidelines to optimize treatment for a specific illness. Clinical pharmacologists and geriatric medicine specialists have pointed out that implementation of treatment guidelines for each disease the older patient has leads to extreme polypharmacy when multiple diseases are present. Often concurrent implementation of guidelines result in conflicts, contradictions, and
the simultaneous use of drugs that are known to have harmful pharmacokinetic and/or pharmacodynamic interactions (Boyd et al, 2005; Tinetti et al, 2004). The geriatric clinical pharmacologist brings the appropriate training and knowledge base to either resolve these therapeutic dilemmas or to conduct the research needed to inform optimal patient care.

The multidisciplinary health care team is championed by geriatric medicine as the optimal means of providing care for the complex older patient with multiple concurrent illnesses. The clinical pharmacologist has a key role on this team, working closely with the primary geriatric medicine clinician, the clinical pharmacist, and other members of the team to individualize and modify complex drug therapy regimens as the clinical status of the older patient evolves over time.

As the population ages in developing countries, the role of the clinical pharmacologist assumes even greater importance. Therapeutic decision-making for older patients with multiple illnesses that may benefit from drug therapy must be placed in the context of selection of the most crucial and cost effective treatments in the face of limited resources. Here too are excellent opportunities for the clinical pharmacologist to team with the clinical pharmacist and other health care team members to afford the best pharmaceutical care to the largest number of older patients.

**Literature Cited:**


