Clinical Pharmacologic Optimization of Drug Therapy in the Elderly

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The geriatric population represents an increasingly large proportion of the total population in the world. A number of physiologic changes occur with aging which may potentially alter the pharmacokinetics and pharmacodynamics of drugs in the elderly population. This may result in an altered therapeutic or toxic response in these patients. Therefore, drug therapy in this age group requires a careful individualization based upon the principles of clinical pharmacology. Moreover, the problem of adverse reactions is particularly pertinent to elderly patients because they consume a disproportionate amount of drugs to treat chronic illness. However, most major drug studies to determine clinical pharmacology are performed in individuals less than 55 years of age.

Changes in some physiologic parameters with aging, such as renal function, may readily predict changes in drug pharmacokinetics. Other parameters are less predictable to quantitative changes in the pharmacokinetics. Despite the limitations, it is important to take these changes into account when choosing durg therapy for the elderly in order to minimize adverse effects and maximize potential benefits. This is particularly important when prescribing drugs with a narrow therapeutic index, interacting drugs and in concurrent disease states. When available, monitoring of plasma concentrations can assist in the optimization of drug dosage. Delineation of pharmacokinetic changes, although extremely helpful, may be little use if pharmacodynamic changes are ignored. Fortunately, more conclusive evidence is now being presented in combined kinetic and dynamic approach. An increased sensitivity to many agents affecting the central nervous system and homeostatic system is becoming apparent. In closing, several lines of geriatric clinical pharmacology research may prove to be fruitful in helping to manage the complex task of treating the elderly with drugs. Future studies are needed to determine quantitative measures to allow estimation of a drugs' pharmacokinetics and pharmacodynamics in an elderly individual.