Institute for Alternative Futures
Foresight Seminars on Health and Innovation

SUMMARY

FORESIGHT SEMINAR ON
THE FUTURE OF DRUGS AND THE ELDERLY
OCTOBER 16, 1984

ABSTRACT

Drugs now under development must demonstrate safety and efficacy with respect to several specific target patient populations. Elderly patients have been recognized as posing unique circumstances for manufacturers, physicians, and regulators.

The elderly population has emerged as a significant consumer market. Growing in size, this group already uses a disproportionately large part of the health care budget and particularly the pharmaceutical budget. Elderly patients are often on extremely complex drug regimens.

In the past, drugs were not tested specifically in elderly populations. A growing awareness of different age-dependent biological responses in this group is altering that approach, to minimize the adverse effects currently appearing only after marketing.

The system of new drug development is changing. In the future, drugs will be developed and tested for elderly patients' special physiological variables. The information revolution will facilitate this change. Using computers, physicians will help select and monitor drugs in individual patients and in target populations. With the increased ability to process and analyze data from individual patients, physicians will be able to monitor drug effects, both beneficial and adverse, more accurately.

BACKGROUND

The October 16 Foresight Seminar on drugs and the elderly looked at the coming changes in demographics, drug regulation, standards or clinical testing and advances in information management technology - computerization - that will change the way drugs are developed, prescribed and monitored in elderly patients. William B. Abrams, M.D., F.A .0.?., Executive Director for Scientific Development, Merck Sharp & Dohme Research Laboratories, outlined the altered demand for drugs and the need for more testing 5y the growing elderly population. Robert Temple, M.D., Director of the Office of Drug Research and Review at the Food and Drug Administration's National Center for Drugs and Biologics, focused on some proposed improvements for testing drugs in elderly patients. Julian Fisher, M.D., Executive Vice President of Computers in Medicine, Inc., and a Harvard Medical School faculty member, presented a new information processing system with which physicians can monitor their patients' clinical status and drug therapy, including automated drug interaction checking, drug education, and epidemiological surveillance in the practice setting.

WILLIAM B. ABRAMS

Greater attention to the use of drugs by elderly patients lies ahead. Pharmaceutical manufacturers and government, including legislators and regulators, will have to respond to these future trends in medical treatment for the elderly.

The first major trend is the increasing proportion of the elderly within the population: while other age groups remain constant, the elderly population is growing; second, the elderly will use an increasing proportion of the health care budget. In 1980, 11 percent of the population was over 65, and this group used 29 percent (about $65 billion) of the health care dollars. By 2040, 21 percent of the population will be older than 65 years, and are expected to use 45 percent (about $170 billion) of health care expenditures.

In the past, elderly patients have frequently been excluded from drug trials in order to maintain standard trial conditions.

Elderly patients have much more variable responses to drugs, from normal to abnormal depending upon the rate of decline of their organ functions, concurrent illnesses, other drugs, etc. While some elderly patients are like younger patients, many have begun to experience some decline in the physiological functions of their organ systems. Organ functions decline at different rates within the same patient and across the population. Most important are the kidney and liver which are responsible for drug elimination. Concurrent illnesses, smoking, alcohol and other variables confound the situation.

Because of these factors, elderly patients may have more frequent and severe adverse reactions to drugs. Because of these special considerations in the treatment of the elderly, a recent task force composed of representatives from industry, the FDA and academic drug researchers recommended changes in the way drugs are tested.

The biggest change in the way drugs are developed for use in elderly patients is that drugs will be systematically tested in elderly patients before marketing. Elderly patients will be included in protocols if they qualify. Study results will be analyzed for age-related effects. The taskforce panel recommended that drugs requiring special attention are those that: 1) are used predominantly by elderly patients; 2) act on the central nervous system; 3) affect biological homestatic mechanisms; 4) have low therapeutic to safety ratios and are eliminated by the kidney.

Drugs should be tested in their target population. Drugs for such diseases as Parkinsonism, dementia, glaucoma and osteoporosis should be studied predominantly in elderly patients.

In the future, special attention should be paid to the pharmacology--how a drug interacts with the body and is excreted--of drugs in the elderly. Physicians should all look more closely for unexpected adverse effects during the early post-marketing period. During this

time, hundreds of thousands of new patients are exposed to the new drug, and low-incidence side effects may appear. Finally, future labeling and packaging of drugs for the elderly must consider their special problems. For example, child-proof packaging limits elderly patients' access to drugs more than children are limited. Drugs should be easy to identify and instructions should be simple.

ROBERT TEMPLE

Future drug trials should go beyond current standards. First, drug trials need to be designed to assess the relationship of drug response to drug dose and blood levels in patients. The effective or toxic dose depends on the pharmacokinetics of a drug in individuals — how rapidly it is metabolized and excreted from the body. For example, if a patient metabolizes or excretes a drug more slowly than normal, as is often the case in elderly patients, it probably should be given at lower than normal doses. The relationship of pharmacokinetics and thus of dose to various conditions, such as age, the presence of other diseases, or the presence of other drugs need to be worked out better. The FDA will be seeking more and better pharmacokinetic information.

Second, future drug investigators should begin to look at all drug trial data to see whether any patient characteristics are associated with a different response, either favorable or toxic. Better pharmacokinetic information will in part be derived from specific studies in patients with special characteristics, such as old age, Kidney failure, etc. In addition, FDA has suggested a "screening" approach in which patients in clinical trials would have a small number (1-2) of drug blood levels measured to look for unanticipated differences, e.g., individuals with especially high or low values or groups that tend to be lower or higher. This kind of screen has not been tried and we and industry believe it is promising but needs pilot testing.

Future drug researchers should look more closely at pharmacodynamics--the relationship between blood levels and drug response-—in the elderly. This has been studied to some degree in the past but it is difficult to study, especially if good pharmacokinetic data are not available first.

JULLIAN FISHER

Advances in medical science have increased patient life expectancy, added more complex medical diagnoses, and created a vast number of new drugs and therapies. The problems of drug therapy in the elderly population serve as a model of how the latest information management technology can benefit physicians' analysis of response to drug therapy in their patients.

With advanced computer technology becoming ever more affordable to the practicing physician, they can work with such systems to retrieve, display graphically, and correlate such information as laboratory results, vital signs, and drug therapy. Drug efficacy for a given patient can be evaluated at a glance.

The computerized information system developed by Computers in Medicine, Inc. also facilitates the automatic checking for potential drug interactions. Elderly patients on a complex array of drugs are at risk as additional medications are prescribed. In the context of a busy office, clinicians may not be able to check all of the potential interactions, since the information is located in multiple textbooks and is not necessarily up—to-date.

Current and future clinical information management systems will not only monitor drug interactions in comparison to a continuously updated database but will also provide critical patient information on their medications. The information will be customized, so. that the elderly or the pregnant will receive data applicable to their specific conditions.

Apart from the growing elderly population, another trend in medicine makes clinical information management more critical. Increasingly, physicians are practicing in groups. More than one physician may be treating the same patient for different problems - and prescribing medications. Each physician should be aware of all of the drugs that patient is taking and be able to check for potential interactions.

By making information more accessible and by analyzing and presenting it in a more useable fashion, computers are assisting clinicians in the delivery of higher quality, more cost-effective, and more humane care.

QUESTION AND ANSWER

When asked about the problems of elderly patients taking several forms of medicine at the same time, Dr. Temple suggested that physicians first must have good information about how individual medications work in patients. This will often guide combination therapy as well. Some of the more important and common combinations can also be studied.

Dr. Fisher responded that computers will help physicians monitor their patients. For example, computers can remind physicians to check physiological parameters that should be assessed regularly in patients with chronic diseases or in those taking certain medications.

Asked how soon such computer applications will be available to physicians, Dr. Fisher predicted that "within five years no group-practice physician will be without computerized information systems." These changes are being driven by decreasing costs and increasing demand for such technologies as minicomputers and laser discs.

Asked if such information systems will be interfaced with computer systems in pharmacies and other parts of the health care system, Dr. Fisher highlighted the need first for developing specialty software. The formats for different users vary, making it difficult for different disciplines' systems to communicate via computer.

Will post-marketing surveillance be easier with such computer systems? It's a difficult area, Dr. Temple said. Such systems give poor data on adverse reactions because of several problems, including poor reporting, poor records and low frequency of many adverse effects. It's hard to do formal studies in uncontrolled settings, he said. A physician has to first recognize an adverse reaction and connect it with a drug. You certainly can raise hypotheses, he continued. Every physician should expect the unexpected for the first few years of using a drug. They should look for adverse reactions in their patients.

Computer systems will help physicians spot adverse reactions, Dr. Fisher said.

Scanning data bases is remarkable for generating possible associations, Dr.Temple agreed. You get a large number of hypotheses, but you still have to go back and prove these.

The hypotheses are often wrong, Dr. Abrams pointed out. A collection of events in an uncontrolled setting readily occurs by chance alone. Thus careful clinical trials by appropriate designs are required to link a given drug to an uncommon reaction.

For those trying to figure out how to finance the cost of health care for the elderly, good drug therapy is the least expensive way to manage illness. It keeps people out of hospitals and reduces hospitalization costs, Dr. Abrams said.