

MEDICATION COMPLIANCE AND THE AGED: AN EDUCATIONAL CHALLENGE

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Abstract:

The aged are major consumers of prescription medications. Physiological changes and multiple prescription regimens coupled with an increased incidence of chronic disease increases the likelihood of adverse drug reactions. This paper outlines some of the research related to noncompliance of prescription medication and identifies some educational interventions guidelines for health care professionals.

Article:

Recent drug education efforts have been directed at school children and young adults with little attention focused on the major medication consumer group. At present, the elderly consume 25% of all prescription drugs yet represent only 10% of the population (Donahue, Griton, Baumler, Moerhlin, & Strayer, 1981). Although mortality rates have decreased, the elderly continue to be vulnerable to diseases and accidents. This fact coupled with the chronic degenerative nature of the diseases of aging increases drug taking behavior, and subsequently adverse drug reactions among this age group. Often living alone in the *community*, the elderly are usually responsible for their self-care, including compliance with prescribed medication regimens. Although elderly people receive a considerable amount of retraining in the ordinary aspects of living and self-care, surprisingly this most important aspect of their life is omitted. Levy and Glanz (1981) believe a growing body of literature reports non-compliance and drug misuse in the elderly patient.

RESPONSE OF THE ELDERLY TO DRUGS

Primary aging causes physiologic changes which affect pharmacokinetics. The absorption, or passage of drugs from the intestine to the bloodstream, may be impaired due to a reduction in the cellular digestive system and diminished quantities of hydrochloric acid secretions. These factors alter the solubility and ionization of drugs. Other physiologic changes affecting absorption in the elderly include a decrease in lymphoid cells and pancreatic enzymes, reduced peristaltic activity, and reduced blood flow to the gastro-intestinal tract (Mullen & Granholm, 1981).

The bioavailability of drugs may be altered by slower absorption and several other factors not common in the younger adult. As systemic blood flow decreases with age so does cardiac out-put. A reported compensation process increases blood distribution to the heart and brain with a reduced portion to the liver and kidneys. If this compensation process actually occurs, drug distribution would be in higher concentration in the heart and central nervous system. Increasing proportions of body fat may provide excessive drug storage capability and affect desired bioavailability distribution.

Biotransformation appears to be the least affected pharmacokinetic process. The conversion of substances in the blood to readily excreted forms is largely done in the liver. Although there is some decline in enzyme activity, the liver, if healthy, has considerable reserve capacity.

Excretion is considerably slower in the elderly person. Although some excretion is accomplished through sweat, saliva, and the lungs, the main routes are the kidneys and gastrointestinal tract. Nephrons in the kidneys gradually atrophy and are replaced by scar tissue causing drug accumulation and at times, toxicity.

Adverse drug reactions occur more frequently among the aged (Donahue et al., 1981). Yet, drugs are typically tested on young people who are taking one medication for a single disease and are otherwise healthy.

Concurrent use of several prescribed drugs and nonprescription medication further complicates the effects of prescribed medication on the elderly patient. Nutritional status and disease state will also play a part in the pharmacokinetic process. Pascarelli (1974) found that nearly 20 percent of the patients admitted to the geriatric service in a big city general hospital showed disorders directly attributable to prescription drugs. Eating disorders, forgetfulness, tremors, weakness, and other symptoms in the elderly may be drug induced.

PRESCRIPTIONS, MISUSE, AND NONCOMPLIANCE

The high incidence of chronic disease and more than one diagnosis by the same or other physicians is reflected in multiple drug regimens (Tideiksaar, 1979). Mandoline (1981) contends that there are four primary reasons why the aged are prescribed so many drugs. First, there may be a legitimate health need. Second, is a problem inherent in the modern medical practice; the physician feels a need to offer a technical solution to clients. Third, is the *age* grading or age bias of health services. Since the elderly have a short time to live, the physician may prescribe drugs, especially psychoactives, rather than utilize referrals or provide more involved or time consuming therapies. Fourth, the influence and pressures of the private drug industry has increased drug prescriptions. The greater number of drugs prescribed, the higher the probability of medication errors (Hulka, Cassel, Kupper, & Burdette, 1976; Kim & Grier, 1981).

Medication errors are usually unintentional and are the responsibility of the patient, physician, and at times, other health service personnel. Physicians generally underestimate the rates of non-compliance in their practice, are inaccurate in identifying non-complaint individuals, and attribute noncompliance to the patient's uncooperative personality and inability to understand recommendations (Zola, 1977). The accurate measurement of adherence is a complicated procedure which may rely on biochemical assessments, intrusive activities such as primary checks and pill counts, and patient interviews.

A medication study of adult onset diabetes clients and congestive heart failure patients between ages 50 and 75 described and measured four types of medication errors in doctor-patient pairs (Hulka et al., 1976). The error types were computed into error rates:

1. Omission rate—proportion of drugs the patient was *not* taking of those prescribed by the physician.
2. Commission rate—proportion of the drugs the patient *was* taking which the physician had not prescribed.
3. Scheduling misconception rate—proportion of prescribed drugs taken by the patient for which the patient did *not* know the correct schedule.
4. Scheduling noncompliance rate—proportion of prescribed drugs taken by the patient for which the patient knew the correct schedule but did *not* take as prescribed.

Findings revealed a 58% error rate with scheduling noncompliance as a minor component. Neither patient characteristics nor severity of the disease were influential. Where the complexity of the scheduling was great, the higher the commission and scheduling misconception rates. Where more drugs were involved, the higher the omission and commission rates. For congestive heart failure patients, communication of instructions and information was inversely associated with drug error rates.

Other studies (Kim & Grier, 1981; Kendrick & Bayne, 1982) have shown age, ability to cope with the environment, knowledge about medications, memory, sensory limitations, strength, inadequate labels, and awkward container design as the other factors leading to prescription misuse and noncompliance. Further, the elderly may hoard old drugs, share medication with neighbors, mix different drugs in one container, or be unable to afford pre-scribed medication.

EDUCATIONAL INTERVENTIONS

The elderly will remain at high risk until new attitudes about drug prescribing and management are developed by physicians, pharmacists, nurses, educators, and caseworkers (Korock, 1978). Physicians themselves or other professionals in the health care delivery system may be the key persons to improve the chances of medication compliance. Detailed drug histories, conservative prescription practices, caring communication, instructional and informational methods designed for the elderly learner, and encouragement to question health care personnel should enhance adherence to medication and treatment regimens.

Hingson (1977) believes that physicians may be able to initiate a caring dialogue with the patient, instill a meaning to the medication, identify potential noncomplying patients and forestall non-compliance by asking (at minimum) the following questions:

1. Have you been taking anything for this problem already?
2. Does anything worry you about the illness?
3. What can happen if the recommended regimen is not followed?
4. How likely is that to occur?
5. How effective do you feel the regimen will be in treating the disorder?
6. Can you think of any problems you might have in following the regimen?
7. Do you have any questions about the regimen or how to follow it?

The patient should be given adequate time to respond and the physician should wait for responses even at times of silence. Through this procedure, the physician-patient relationship may improve and information will come to the physician's attention which may be used to foster compliance. If a patient is told to take the drug four times a day—should they wake up in the middle of the night—or what happens if they miss a dosage? The traditional doctor-patient interaction is not conducive to this type of dialogue. Nonetheless, improved doctor-patient communication is vital to the reduction of medication noncompliance.

The physician should determine whether the patient is able to follow the prescribed therapy. Will a diabetic patient with retinopathy and cataracts be able to measure insulin in a syringe? Will the arthritic patient be able to open a child-proof container? Is the patient able to swallow tablets or capsules? Will the patient be able to afford the prescribed medication?

Although the physician plays a key role in medication compliance, for practical purposes, the nurse is a key medication educator. The nursing profession has identified as one of its principal responsibilities the teaching of patients (Alfano, 1982). It is the nurse who admits the overdosed or underdosed elderly patient and it is also the nurse who plans the forthcoming discharge of the cardiac patient with four new medicines. The pharmacist is another well placed professional for the purpose of drug education yet the lack of private consultation rooms often prevents communication opportunities (Korock, 1978).

Whether it is the physician, nurse, pharmacist, or caseworker who provides drug education, special consideration must be given to factors influencing learning in the elderly. As in all learners, the feeling of a need to learn is important. Most elderly patients lack information and will ask simple questions (e.g., What is the yellow pill for?), thereby establishing a need to learn. The elderly person may have reduced problem-solving ability, especially when needed information is unavailable and when irrelevant information is present. Thus, providing simple and needed details may improve problem-solving. Extra time is suggested when instructing the elderly. Older learners tend to ask more questions than young adults and also need more time to process

information and then respond. Short-term memory may also be expected to decline with age. Associations of new tasks with old behaviors may facilitate the learning process. It is suggested that simultaneous learning activities may have a negative effect on the elderly learner so individual learning tasks should be mastered before beginning another. Changes in visual acuity may result in difficulty with simple vision or color discrimination, especially in bright light. Thus, referring to the "blue and green pills" may be a dangerous way to explain a drug regimen. Auditory acuity may diminish causing incomplete or inaccurate message reception. Communication should be in lay language, yet, not in childlike lessons. Life experience examples are encouraged and consideration of the person's cultural back-ground is advised.

Timing of instruction is another factor influencing learning in the elderly. While there is no agreement about the decline of learning ability with age, there are proven differences in the elderly learner which need to be considered by medical personnel involved in the drug education of older adults (Da11 & Gresham, 1982). Hallburg (1976) has offered a list of ten strategies for teaching aged adults:

1. Select visual aids that minimize the need for visual acuity or precise discrimination.
2. Seek a position in physical relationship to the person so as to maximize the strength and clarity of sensory stimuli.
3. Adjust work/minute rate to a level that makes the auditory in-puts clearly perceptible to the person.
4. Determine with the older person the type of aid or media for input that facilitates his learning, e.g., auditory, visual, tactile, or some combination.
5. Utilize teaching strategies or materials that permit the person to control the presentation pace of content to be learned.
6. Seek feedback from the person regarding such things as pace, speech intelligibility, meaningfulness of content.
7. Select a place and time when simultaneous activity in the environment will be minimal in order that competing stimuli will not disrupt the person's learning.
8. Select a time for teaching when the person is not preoccupied with other concerns, e.g., recovery from illness, grieving, or finances.
9. Provide opportunities for recall of new information and practice of performance of tasks preferably within a day's time, or within a week of presentation at most.
10. Relate new learning to the past and present experiences of the person.

Recent studies applying seemingly appropriate teaching methods have demonstrated improved knowledge and compliance behaviors. Kim and Grier (1981) conducted a study of slow paced learning events including five areas of instruction: name of the drug, purpose, frequency, dosage, and time of drug administration. Findings revealed that elderly patients receiving slow-paced instruction (106 words per minute) showed greater knowledge gains from the pre-test to the posttest than did the normal pace group (159 words per minute) and self-paced group. Recall was found to be difficult for all subjects after 1.5 minutes but recognition was noted to be the important skill when considering at-home medication practices. It is suggested that written information be given to the elderly patients in addition to verbal instruction.

Written memory aids are being introduced by pharmacists and physicians at an increasing rate. One study (Gabriel, Gagon, & Bryan, 1977) of geriatric hypertensive patients using daily drug reminder charts to

reinforce verbal instructions found a significant increase in patient compliance; greater knowledge of drug use, dose, frequency of administration, and time interval; and higher compliance scores in those patients having a positive attitude toward the chart. In another study of written memory aids, Wardless and Davie (1977) examined patients receiving verbal directions only and verbal instructions with a tear-off calendar aid or a table identification card. Patients all had reasonable visual acuity, were oriented in time and place, and received their medication in manageable containers with typed labels. The tear-off calendar group performed significantly better than the table identification card group. Both of these groups erred significantly less than the group receiving no written memory aid.

A variety of memory aids have been designed to assist the aged with medication compliance. The *egg crate* technique, daily flow chart and pill dispensers (similar to those used for birth control pills), are examples of a few such techniques. Health care professionals should encourage the aged to use some type of memory aid to increase medication compliance.

In summary, medication errors can be reduced by using caring interventions and established educational strategies, including low-cost memory aids. Agreement in the medical community as to who is responsible for educating the elderly patient should enhance medication compliance.

CONCLUSION

In proportion to the total population, the elderly are the major consumers of prescription drugs. The elderly experience physiological changes which place them at high risk to adverse drug effects including toxicity. Although they may take several medications concurrently, the elderly are often insufficiently informed about prescribed medication and frequently make dangerous errors in their drug regimens. Medical care providers need to be cautious when prescribing, communicate in a caring manner with the elderly patient, and provide educational interventions which are sensitive to older adult learning styles. Medication compliance rates can be increased in the elderly patient, yet, attitudinal barriers in the medical community appear to be the greatest challenge to this health education issue.

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