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SAFE AND EFFICACIOUS MEDICATION FOR THE ELDERLY

by

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SAFE AND EFFICACIOUS MEDICATION FOR THE ELDERLY

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1. PRINCIPLES OF PRESCRIBING DRUGS FOR THE ELDERLY

Because of multiple disease states and the wide use of drugs in the elderly, the potential for altered responsiveness to drugs and the higher incidence of adverse effects compared with the younger patient, it is important to define certain basic principles of prescribing for the older patient (Anderson, 1974. Vestal, 1978. Table I).

1.1 Is drug therapy required?

It is important to realise that many of the diseases from which the elderly suffer are doing the patient no immediate harm and do not require treatment. Certainly there is no need to prescribe a different drug for each disease or symptom simply because of the multiple pathology present in the elderly. Indeed, it is surprising how often the elderly are better off without some drugs. Many old people admitted to hospital or reviewed during long term hospitalisation improve greatly when the regimen of drugs that they have been taking is stopped (Burr et al., 1977; Learoyd, 1972). This also means that a drug should not be used for longer than necessary: the need for repeat prescriptions

should be reviewed at periodic intervals. These edicts do not mean, however, that drugs should be withheld on account of old age, particularly when appropriate drug treatment can improve the elderly person's quality of life.

1.2 If drug treatment is required, which drug is appropriate?

The margin between therapeutic effect and toxicity is so small in many cases that a drug which is indicated for a particular condition in younger patients (for example, carbenoxolone for gastric ulceration) may be unsuitable in the elderly with the same condition. Similarly the age related toxicity of barbiturates makes the use of this group of drugs undesirable in the elderly (Bender, 1964).

1.3 Is the patient being asked to take more drugs than he can tolerate or manage?

The fewest drugs that the patient needs should always be used. The more drugs prescribed the greater the chance of adverse drug reactions or drug interactions, thus the likelihood of toxicity increases as the number of drugs prescribed rises. In addition, there is an increased likelihood of errors by the patient in taking the medication leading to a possible lack of efficacy or an increase in toxicity. Medication errors, especially of omission, non-comprehension and non-compliance with medication instructions are common in the elderly (Schwartz et al, 1962; Parkin et al., 1976). Slowness of comprehension and lapses of memory, particularly short term memory which deteriorates with age, make it difficult for the elderly to manage complex drug regimens.

1.4 Which type of preparation to be used?

Apart from the total number of drugs prescribed, the dosage form, and the size, shape and colour of tablets and capsules and their similarity to one another, are all important considerations (Mazullo, 1972). Many older people have difficulty in swallowing, consequently large tablets and capsules should be avoided.

There is a good case for the use of liquid preparations such as syrups for many patients, or of effervescent tablets. On occasion, the suppository may be the most suitable method of administration, for example, indomethacin at night for relief of nocturnal pain and morning stiffness of rheumatoid arthritis.

Many tablets and capsules of widely differing pharmacological actions are of similar size, shape and colour. This causes confusion for the patient: the loss of vision of the elderly in particular makes it difficult for them to determine which preparation they are taking. Touch and colour vision are however, well preserved in the elderly. Thus preparations to be used together should not be of the same colour or the same shape.

The more distinctive the pill is, the easier and safer it is to use.

1.5 Should the standard dosage or dosage schedule be modified?

As a rule the elderly patient requires smaller doses of drugs than are customarily given to the young adult, e.g. the starting dose of thyroxine and the maintenance dose of digoxin. Drugs usually given in reduced dosage in the elderly are listed in Table 2
Whenever possible, intermittent schedules, such as drugs given on

alternate days or 5 days a week should be avoided, since they are rarely followed with accuracy. Once daily dosage is the ideal, whenever feasible. Apart from convenience to the patient and thereby better patient compliance, once daily dosage at night, for example of psychotherapeutic drugs (Ayd, 1972, 1974) may well avoid troublesome adverse reactions since the patient would be asleep when these effects would be most troublesome. Other drugs may be best given as a single dose in the morning, for example diuretics.

1.6 Which side effects are likely to occur? Which drugs should be avoided if possible? (see Tables 3 and 4)

The elderly differ from the young in that drugs more frequently lead to confusion and vague ill health. Drugs which act on various systems such as the gastrointestinal tract for example, are more apt to produce gastrointestinal upset in the aged. Similarly, psychotherapeutic drugs may frequently induce markedly abnormal behavioural responses in older patients, while in younger patients these are much less common (Davison, 1971, 1972).

1.7 Should the drug be specially packed and labelled?

Where possible, drugs prescribed for the elderly living at home should be packaged in readily opened containers so that disabled patients in particular are able to use them (Law and Chambers, 1976). Clear labelling in large print is also very important.

1.8 Can the patient living at home manage self medication?

The elderly patient should be taught to understand his drugs, particularly their relative importance to his well being, and time

be spent to educate him in their use and administration (Gibson and O'Hare, 1968). Sometimes it may be necessary to provide clear instruction in writing about the manner in which a drug should be taken or to suggest the use of a diary or calendar to record daily drug administration (Wandless and Davie, 1977).

Collaboration with a responsible and interested relative, neighbour or friend can be helpful. Even with these and other considerations, discussed above, some drugs are best kept in the custody of others. Recent surveys have shown that many elderly patients living at home have potent drugs prescribed for them when they are mentally unfit to be responsible for their use (Shaw and Opit, 1976).

It is imperative in such cases that a responsible relative should have charge of drug treatment. If there are no relatives it may be necessary to ask the community nurse to administer drug therapy. Sometimes these arrangements are necessary for physical reasons, for example, an elderly diabetic with impaired vision cannot be expected to measure out an injection of insulin with safety.

1.9 Is there a need for continued medication?

Because a drug such as digoxin has been prescribed in an acute episode, for example, atrial fibrillation complicating pneumonia, there is no reason for its continued use once the acute episode is satisfactorily treated. The same is true of many drugs commonly prescribed. It is useful to review treatment regularly and discontinue drugs no longer wanted (Burr et al., 1977; Learoyd, 1972).

Elderly patients tend to hoard drugs (Law and Chambers, 1976). Accumulation of medication will only serve to confuse the patient and encourage use of drugs from prior treatment programme. To aid in the review of old, and current medication, patients should be encouraged to bring their containers to consultations in private practice and also in hospital outpatient departments. Any medication not required can then be destroyed.

2. DRUG TREATMENT IN THE ELDERLY

The principles of treatment which pertain especially to older patients can be illustrated by a discussion of a variety of clinical syndromes frequently found in the aged and in which the response to drugs commonly used for the conditions can be different from that occurring in younger patients. The problems related to the use of drugs in elderly patients with such conditions as congestive cardiac failure (digitalis glycosides and diuretics), diabetes mellitus (sulphonylureas), hypertension (β -blockers and diuretics), rheumatic diseases (anti-inflammatory and immunosuppressive drugs) and thrombo-embolic disease (anticoagulants), have been reviewed in detail by Crooks and Stevenson, 1979; Judge and Caird, 1978; Vestal, 1978. The safe and efficacious use of drugs in elderly patients with these conditions can only be achieved if the prescriber applies the principles of drug treatment for elderly patients described above together with knowledge of the differences in pharmacokinetics and pharmacodynamics of the drugs used in their treatment.

However many of the drugs prescribed for elderly patients are prescribed, not for recognised syndromes but for symptoms related

to the multiple diseases associated with the aging process. In addition, the elderly have difficulties in adapting to their physical, psychological and social environments, which may be expressed as symptoms. It is important to recognise that the symptoms of elderly patients do not invariably require the use of drugs, and even when they are indicated they must be used carefully. This applies particularly to the psychotherapeutic drugs (Hollister, 1975; Learoyd, 1972). The drug treatment of the most frequent symptoms in elderly patients is discussed below.

2.1 Insomnia

If treatment with hypnotics is required the choice of drug is restricted. The barbiturates should be rarely used in this age group. A chloral derivative such as triclofos, the benzodiazepines, and chlormethiazole are safe and effective hypnotics used judiciously as a short course of therapy to restore the patients 'normal' sleep pattern. Occasionally, confusion is seen following the use of these hypnotics (this seems to be less with chlormethiazole; Magnus, 1978) and even more uncommonly, prolonged action leads to daytime drowsiness. Unwanted effects with nitrazepam and flurazepam in the elderly are more common if doses larger than those given above are used. (Greenblatt et al., 1977; Greenblatt and Allen, 1978). The enhanced response to nitrazepam in the elderly seems to be related to increased 'sensitivity' of the aging brain (Castleden et al., 1977), and similarly also to diazepam (Reidenberg et al., 1978).

2.2 Confusion

This is a symptom which has many causes and drug side effects

should always be excluded. If no cause can be discovered, or if specific treatment is unsuccessful, then symptomatic treatment with one of the phenothiazine drugs is often used, and thioridazine, given orally, is probably the drug of choice for mild and moderate confusional states in the elderly. A total daily dose of 100 mg should rarely be exceeded. If a parenteral preparation is required, then promazine or chlorpromazine intramuscularly may be used. Postural hypotension is the most common side effect from these drugs in the elderly and is particularly likely to occur if the patient has organic neurological disease. Haloperidol is useful in controlling the very agitated patient. It is available as a parenteral preparation, but both the phenothiazines and haloperidol can cause extrapyramidal reactions (Table 2). Choreiform side effects are particularly common in the elderly (Salzman et al., 1976).

2.3 Anxiety

Anxiety in older people is commonly due to worry about finance, housing, health, etc. Drug treatment is not always indicated as it may be possible to alleviate the underlying cause. Anxiety as an isolated symptom responds well to chlordiazepoxide or diazepam. The phenothiazine drugs are also effective in many cases. Meprobamate is also a useful drug but can cause confusion in older people. All these drugs may produce postural hypotension or lead to unsteadiness or falls in the elderly. Anxiety may be a manifestation of a depressive illness and care should be taken to look for this, since treatment with conservative doses of a tricyclic antidepressant drug may be extremely effective.

2.4 Behaviour Disorders

The most common cause of behaviour disorder is confusion and its management is described above. Where the behaviour disorder contains a psychotic element, psychiatric help will be required but occasionally however, disorders of behaviour are seen in hemiplegia. This should not be confused with the depression which often results from insight on the patient's part into their condition. The latter requires reassurance and possibly tricyclic antidepressant drugs.

2.5 Mental Deterioration

Many conditions, as well as problems of living, can contribute to the impaired recent memory and decreased mental alertness associated with old age. While careful use of drugs can be used to treat symptoms such as confusion and behaviour disturbances, there is no good evidence that drugs which may modify the changes in cerebral function found in patients with senile dementia (Alzheimer's syndrome) or cerebral arteriosclerosis are of proven value in clinical practice.

2.6 Constipation

Constipation is probably the most common symptom in the elderly, particularly in women. It is important not only because of its increasing prevalence with age but also because of the variety of complications, notably those arising from faecal impaction, which may arise (Exton-Smith, 1972). Nevertheless, constipation may not be truly present in old people as their obsession with their bowels is such that they consider they have constipation if they do not

have at least one bowel motion daily. Much of the laxative-taking by the elderly is unnecessary. Thus in every case it is not only important to establish the cause of the constipation but also whether any laxative-taking is really necessary.

A number of hazards can result from inappropriate choice and use of laxatives in the elderly (Table 5). An appropriate laxative for the elderly is standardised senna in the minimum effective dose, and after a few weeks, when bowel habit has become regular, the dose can be gradually reduced and often stopped altogether. Regular use of laxatives is however, often required to prevent faecal impaction in those who have had more than one episode not due to a temporary illness or confinement to bed. Small volume enemas such as the phosphate or citrate type are usually required in the initial treatment of severe constipation and in faecal impaction. General measures such as instruction about what constitutes a regular bowel action, the desirability of physical activity, an adequate fluid intake, and the use of high residue diets and bran should not be forgotten.

3. CONCLUSIONS

The "safe and efficacious" prescribing of drugs for elderly patients requires an understanding of the pharmacokinetic and pharmacodynamic characteristics of the drugs when used in the elderly. It follows that clinical pharmacological research in this field should be encouraged. "Safe and efficacious" prescribing of drugs for elderly patients also requires that the

prescriber asks himself the following questions which have been discussed in this paper.

1. Is drug therapy required?
2. If it is required which drug is appropriate?
3. Can the patient "manage" the drugs prescribed?
4. Is the drug regime appropriate for an elderly patient?
5. What side-effects are more likely to occur in the elderly?
6. Can the drug be specially packed and labelled for use by elderly patients?
7. Can the patient carry out prescribing instructions in his/her normal environment?
8. Is there a need for continued medication?

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TABLE I

Summary of principles of drug prescribing in the elderly

1. Is drug therapy required?
 - a) Many diseases from which the elderly suffer do not require drug treatment.
 - b) But, do not withhold drugs on account of old age, particularly when appropriate drug treatment can improve the quality of life.
 - c) Only use those drugs which the patient really needs.
 - d) Drug regimens should be reviewed regularly so that unnecessary drugs are discontinued.
 - e) Remember that drugs may cause illness.

2. Choice of appropriate drug and preparation.
 - a) Is a particular drug which is satisfactory for the younger patient suitable for the elderly? - e.g. increased likelihood of side effects.
 - b) Which preparation? - consider dosage form (syrup, effervescent tablet, suppository instead of capsule or tablet); its size, shape and colour.

3. Dose and dosage regimen
 - a) In general, use smaller doses than are usually given to younger adults.
 - b) Intermittent schedules should be avoided. Once daily dosage is ideal.

4. Medication instructions
 - a) Teach the patient to understand his drugs, especially their relative importance to his wellbeing, and their correct use and administration.
 - b) Drugs prescribed should be clearly labelled in large print and packaged in readily opened containers.
 - c) Supervision of therapy may sometimes be desirable or necessary - e.g. a responsible and interested neighbour, relative or friend, or a community nurse.

TABLE 2

Examples of drugs usually given in reduced dosage in the elderly

Drug	Dosage	Comments
Carbamazepine	100 mg daily, increasing by 100 mg every 4th or 5th day. Reduce dose if drowsiness or ataxia develop	
Chlormethiazole	250 mg 3 times daily	Confusion can occur with larger doses
Chlorpropamide	50 to 500 mg daily	Danger of cumulation
Digoxin	62.5 to 250 μ g daily	
Flurazepam	5.0 to 15 mg	Unwanted CNS depression more common with larger doses
Frusemide (furosemide)	20 to 80 mg daily	May need to be given very early in the morning
Haloperidol	0.5 to 1 mg 2 or 3 times daily	Danger of severe extrapyramidal signs
Levodopa	50 mg daily at first, increasing by 50 mg at weekly intervals	
Metoclopramide	5 mg	Confusion common with larger doses
Nitrazepam	2.5 to 5 mg	Cumulation common and unwanted CNS depression more common with larger doses
Pethidine (meperidine)	Orally: 50 to 100 mg IM/IV: 25 to 100 mg	50 mg usual limit in those with respiratory failure
Sulthiame	100 mg 3 times daily	Can be increased to 600 mg daily if needed
Thioridazine	10 mg 3 times daily	Confusion common in larger dose
Thyroxine	50 μ g daily, increasing by 50 μ g at weekly intervals	
Vitamin D	1,000 units daily or 100,000 units by injection on every 3rd month	
Warfarin	10 mg as a loading dose, 3 to 8 mg on the 3rd day and daily thereafter as per test of clotting time	Many factors can influence response to oral anticoagulants

TABLE 3

Drugs with potentially severe or unusual side effects in the elderly

Drug	Unwanted effect
Benzhexol (trihexphenidyl)	Visual and auditory hallucinations
Chlorpromazine	Postural hypotension, hypothermia
Emepronium bromide	Mouth ulceration (if tablet not swallowed), bromidism
Ethacrynic acid	Deafness
Mefenamic acid	Diarrhoea
Methyldopa	Drowsiness and depression
Oestrogens	Fluid retention and congestive cardiac failure
Disopyramide	Urinary retention
Isoniazid	Hepatotoxicity

TABLE 4

Drugs to be avoided in the elderly if possible

Drug	Reason
All barbiturates	Confusion
Bethanidine	Severe postural hypotension
Carbenoxolone	Fluid retention and congestive cardiac failure
Chlorthalidone	Prolonged diuresis, incontinence
Debrisoquine	Postural hypotension
Guanethidine	Postural hypotension
Pentazocine	Confusion. Variable efficacy
Reserpine	Depression
Streptomycin	Ototoxicity
Tetracycline	Rising blood urea in the presence of impaired renal function

TABLE 5

LAXATIVES

Excessive use may cause dehydration, muscular weakness and hypokalaemia

Bisacodyl	Mild abdominal cramping (oral); tenesmus (rectal)
Bulk-forming preparations	Intestinal obstruction (avoid by giving the granules with generous amounts water)
Cascara preparations	Colic; rectal pigmentation
Castor oil	Pelvic congestion
Diocylsodium sulphosuccinate	Anorexia, vomiting, diarrhoea