SLEEP AND SLEEP PROBLEMS IN ELDERLY PEOPLE

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The reasons for special consideration of sleep and its problems among elderly people are:

- Increased dissatisfaction with the quality of sleep, complaints about insomnia, and use of hypnotic drugs, particularly among women
- Sleep architecture changes with increasing age
- Insomnia may be a marker of physical or psychological disorders, and of social or environmental problems
- The importance of the beneficial effects of healthy sleep, particularly of optimal central nervous system performance, during the day
- There is a need for a more circumspect and thoughtful approach to sleep problems in later life.

Prevalence of sleep problems and use of hypnotic drugs

Percentages of people in different age groups who reported trouble with sleeping.

Surveys in Britain and the United States during the 1960s and 1970s showed a positive correlation between increasing age and subjective sleep problems. This was particularly pronounced among women, and their main complaints were of inadequate depth of sleep, frequent awakenings during the night, and not enough sleep. Getting off to sleep was not a common problem among older people.

Not surprisingly, evidence from many large studies showed that there was a corresponding increase in the prescription and use of hypnotic drugs with age; the mean figure in the community was between 10% and 15% among elderly people and higher among those over 75, women, and those in hospital and residential and nursing homes. The drugs were being taken regularly, for long periods, irrespective of any precipitating cause of the insomnia, and without any clinical review of need. The use of hypnotics probably peaked between 1960 and 1980 before the potential of benzodiazepines to cause dependence had been realised. Nevertheless people taking hypnotic drugs long term often express satisfaction with the results despite the fact that many of these drugs become less effective with time.

Consumption of sleeping drugs according to age.

Risks of treatment

The risks of treatment with hypnotic drugs among older people include accentuated acute sedation (as a result of enhanced central nervous system sensitivity, or changes in pharmacokinetics, or both) and unwanted residual sedation, particularly during the initial stages of treatment. With regular doses there may be appreciable accumulation of the parent drug or its metabolite, which can impair daytime performance, cognition, motor activity, and postural stability in susceptible people. Dependence, rebound insomnia, and other signs of withdrawal are common, particularly with rapidly cleared compounds. All these risks have to be set against the rather ill defined and possibly ephemeral benefits.

Changes in sleep architecture and physiology

Though sleep patterns may change with age, there is more variability among individual people than among old and young

Typical hypnograms for young adults and elderly people.

Studies of older people in the sleep laboratory have shown that they have definite changes in electroencephalographic characteristics, in the sleep cycle, and in the composition of sleep. These include:

- Decreased amplitude in the size of slow waves (the restorative component of sleep)
- Abnormal or "degraded" spindles during stage 2 sleep (the characteristic feature of this stage)
- Decreased number of eye movements during rapid eye movement (REM) sleep, suggesting that it is less intense
- Increased time spent in bed with a decrease in total time spent asleep, showing a reduction in sleep efficiency
- Increased number and duration of awakenings (more pronounced in men) and a reduced arousal threshold for noise (more pronounced in women)
- Appreciable reduction in the total amount of slow wave sleep (in addition to the decreased amplitude)
- Reductions in both the total duration of REM sleep, and the time from the onset of sleep to REM sleep
- Increased number of shifts from one stage of sleep to another
- Increased frequency of daytime napping, more pronounced among men, and the very old (25% of 70 year old, compared with 45% of 80 year old, men).

These findings are broadly consistent with reported subjective complaints of sleep disturbance. In addition, there is some evidence of a reduction in amplitude and for desynchronisation of circadian rhythms (for example, secretion of melatonin). During each decade after the age of 60 there is a further advance of one hour in sleep phase.

All these observations are, however, extreme generalisations and the variability among individual people is if anything greater among older people than among younger ones. The fact that such changes do occur not only helps us to understand sleep patterns better, but may also help to identify objectives to aim for in the treatment of sleep disturbances in older people.

Insomnia

If an elderly person complains of insomnia a diagnostic response is necessary

It is important to make a diagnostic response to a complaint of insomnia in an elderly person, partly because it may lead to the recognition of an underlying physical or mental problem, and partly because it may pre-empt the blanket prescription of hypnotic drugs without good reason.

The following possibilities should be considered:

Any physical illness that causes discomfort may naturally disrupt sleep, and older people are often reluctant to voice such complaints spontaneously. Obvious examples are: nocturnal dyspnoea caused by left ventricular failure; tachyarrhythmias that cause angina or palpitations; gastro-oesophageal reflux; peptic ulcer; constipation; exacerbations of chronic obstructive airways disease; skeletal pain caused by osteoarthritis,

Causes of nocturnal agitation

New onset

Environmental change
Delirium
Bereavement

Recurrent

Disease related

Dementia
Depression
Late life mania
Late life panic disorder
Anxiety disorder
Sleep apnoea
Nocturnal enuresis
Chronic pain syndromes

Precipitating factors

Environmental lighting
Physical restraint
Drugs—for example, phenothiazines
Withdrawal of any psychoactive drugs
Sensory deprivation—physical or environmental
Altered circadian rhythm
Frequent awakenings
Night hunger—meals too early
Social fear of the dark
“Burnout” of staff or carer

osteoporosis, metastatic deposits, or Paget’s disease; and cutaneous pruritis.

Some age related complaints are particularly associated with insomnia, such as bladder detrusor instability and prostatism, both of which may cause nocturia. Nocturnal myoclonus, “restless legs syndrome,” and night cramps are positively related to age, as is “sleep apnoea.” The number of apnoeic events tends to be much lower than found among young people with sleep apnoea, however, and there is controversy about the clinical importance of the syndrome in older people. A degree of respiratory irregularity during sleep may be compatible with aging, and the clinical usefulness of treating mild apnoea is questionable. Some cognitive changes may occur during sleep apnoea and it has been speculated that these may be one of the causative factors in dementia. Hypnotic drugs may exacerbate respiratory problems during sleep.

Psychiatric disorders, in particular depression and dementias, commonly present with insomnia in old age. The threshold for the diagnosis and treatment of depression may not be sufficiently low; in one survey it was found that only a fifth of elderly depressed patients were receiving appropriate drugs, the rest having been given a hypnotic. Dementia was associated with increased wakefulness during the night, and with greater reductions in slow wave and REM sleep than found in age matched subjects who were not demented. In the late stages of dementia there is greater circadian breakdown, though 8% of demented patients seem to maintain a sleep pattern appropriate for their age.

Iatrogenic causes of insomnia include theophyllines, sympathomimetics, diuretics, lipophilic β blockers, and sedatives and hypnotics that cause rebound withdrawal. Caffeine, both in drinks and in over the counter drugs, and high alcohol concentrations have also been implicated.

It is difficult to establish a precise relation between insomnia and social and environmental factors, but isolation, inadequate heating, being in an institution, bereavement, and financial hardship all impair sleep.

Various age related behavioural factors may play a part, including reduced physical activity and reduced exposure to daylight.

Sleep and daytime performance

Incidence of unwanted depression of the central nervous system by flurazepam and nitrazepam according to mean daily dose and age.

The evidence that correction of sleep deficiency improves daytime alertness is good, but there is little specifically about older people. Central nervous system performance during the day may be the key to autonomy and wellbeing in an older person. There is an increased number of road traffic accidents among elderly people, which may be related to lessened alertness. If alleviation of acute or chronic insomnia could be shown objectively to improve performance among elderly people, therefore, it would be an appropriate end point for treatment.

Much has been written about impairment of daytime performance in older people by hypnotic drugs, and the Boston collaborative drug surveillance programme in the 1970s emphasised that this effect was dose related. Benzodiazepines are the most likely to cause immediate oversedation and unwanted residual sedation because of the increase in their pharmacokinetic “sensitivity” with age. The reduction in the rate of clearance is probably less important, but may compound the accentuated responsiveness. It is therefore essential—at least to begin with—to use reduced doses in older people irrespective of the plasma half lives of the drugs being used. The information about the non-benzodiazepine hypnotics is less comprehensive, but the response to compounds in this category that are cleared rapidly (such as chlormethiazole) may be less age related, and therefore more predictable from pharmacokinetic data.

We are therefore justified in seeking better ways of improving the quality of sleep in elderly people, and the evidence that hypnotics have a part to play in improving daytime performance is sparse.

Dealing with sleep problems

Sleep related accidents according to age.

As the disadvantages and hazards of the hitherto rather casual prescribing of hypnotic drugs become more widely recognised, a more considered response to sleep problems should gain ground (though this does not exclude the careful use of hypnotics). Experience so far, however, suggests that in the absence of a structured and rigorous approach to assessment such guidelines are unlikely to be followed.

We suggest the following proposals:

- Allow time to make at least one systematic diagnostic assessment for underlying causes of sleep problems, and try to treat them first before having recourse to hypnotics
- Consider a non-pharmacological approach to "primary" sleep disorders. This may include counselling to allay anxiety about incorrect or inappropriate expectations about sleep (such as the statutory "seven or eight hours a night"). Simple behavioural and cognitive approaches may help, and physical activity and exposure to daylight should be encouraged. These may well rescue people from long term dependence on hypnotics
- Use hypnotic drugs judiciously as third line or adjunctive treatment, and in accordance with defined guidelines.

Conclusion

Guidelines for prescribing hypnotics for elderly patients

- 1 Limit to times of particular stress
- 2 Prescribe a specific dose (not "one or two")
- 3 Use small initial doses
- 4 Advise "if required" rather than habitual use but if possible give a set course of treatment—for example, 3-4 weeks
- 5 Review the response with special reference to side effects
- 6 Aim to discontinue after a short course

Many elderly people have longstanding sleep problems. Increasing awareness of these problems may be beneficial, particularly as increased sleep improves daytime alertness. Techniques for doing this require further study.

The sources of data presented in the figures are: Karacan *et al*, *Soc Sci Med* 1976;10:239-44 for percentage in different age groups that have trouble with sleeping; Spiegel R, Azcona A, *Sleep and its disorders*. In: Pathy MSJ, ed. Principles and practice of geriatric medicine. Chichester, John Wiley, 1985 for age and consumption of sleeping drugs; and Greenblatt *et al*, *Clin Pharmacol Ther* 1977;21:355-61 for incidence of unwanted depression of the central nervous system. The photograph is reproduced with permission of Alan Gale.

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ANY QUESTIONS

I have recently known two patients whose vegetarian diet included much comfrey; both died of bowel cancer. Is there any known connection?

Both common comfrey (*Symphytum officinale* L) and Russian comfrey (*Symphytum x uplandicum* Nym) are known to contain numerous pyrrolizidine alkaloids, such as symphytine, symglandine, and lasiocarpine. Pyrrolizidine alkaloids have toxic properties and may cause liver veno-occlusive disease in humans and animals. Some pyrrolizidine alkaloids have been shown to be mutagenic in vitro and carcinogenic in animals. Activation to reactivate dehydro pyrrolizidine alkaloids by mixed function oxidases is required for expression of toxicity. The content of pyrrolizidine alkaloids varies with the place and season of growth and age of the plant. Levels of pyrrolizidine alkaloids also vary with the type of preparation, as roots and extracts contain more than leaves. In the West the most common human exposure is ingestion of comfrey leaves, roots, and extracts as herbal remedies. There is also potential for exposure by ingestion of comfrey leaves as a staple diet and other pyrrolizidine alkaloids in honey and milk.¹

There is a theoretical possibility that pyrrolizidine alkaloids in comfrey would be activated in the gut, but the relation between the rate of metabolism and expression of

toxicity is uncertain. Furthermore, there is no correlation from epidemiological studies to suggest that long term ingestion of comfrey would result in gut cancer. It is currently believed that both environmental and genetic factors play a part in the development of colorectal cancer, and diets with high meat and low fibre contents and alcohol consumption increase the risk, with vegetarians having a lower incidence.

Although prolonged ingestion of high doses of comfrey leaves cannot be excluded as a contributory factor in the development of bowel cancer in the two cases quoted, it would be speculative to attach any degree of probability to this association.

Data on the toxicity of comfrey are not conclusive. The government believes, however, that there is sufficient information for concern, and, following the recommendation of the Committee on Toxicity and the Food Advisory Committee, it has been agreed recently to withdraw tablet and capsule preparations containing comfrey from the market. It was also proposed that labelling should be introduced to warn against the consumption of comfrey root and limit the consumption of leaves.—LUCIJA PERHARIC, medical research fellow, National Poisons Unit, London

¹ International Programme on Chemical Safety. *Pyrrolizidine alkaloids*. Geneva: World Health Organisation, 1988.