Sleep and the elderly

By Helen Brown

Mrs EF is 78 years old and lives alone. She has osteoarthritis, hypertension, depression and osteoporosis. She also experienced a transient ischaemic attack several years ago. Her current medications, at the time of a Home Medicines Review, are:

- Paracetamol SR 665 mg 
  2 when necessary
- Aspirin 100 mg 
  1 in the morning
- Fish Oils 1,000 mg 
  1 in the morning
- Indapamide SR 1.5 mg 
  1 in the morning
- Venlafaxine SR 150 mg 
  1 in the morning
- Risedronate/Ca 35/500 mg 
  1 daily
- Vitamin D₃ 1,000 IU 
  2 in the morning
- Oxazepam 30 mg 
  1 at night

Cholesterol, blood pressure, serum electrolytes and creatinine results were all satisfactory.

Mrs EF does not have any concerns regarding her medications or her health. Her pain is controlled adequately and she only uses paracetamol every few days. Her diet and activity levels are good and her main issue is that she sleeps ‘very badly’. She has been using oxazepam for 20 years but is unsure if it is of any benefit.

Normal sleep architecture and aging

Sleep is divided into two distinct states: non-rapid eye movement (NREM) and rapid eye movement (REM). NREM is associated with repair of physiological systems and is divided into four stages that comprise 75% of the total sleeping time.¹

Stage 1 NREM sleep is a transition phase between wakefulness and sleep and stage 2 is considered to be the true onset of sleep by most clinicians.¹ About 50% of total sleep time is spent in stage 2 and people can be easily aroused during this phase.¹ Stages 3 and 4 are collectively known as slow wave (delta) or deep sleep and are the restorative sleep stages that occur during the deepest level of sleep.² Somatostatin and growth hormone are released mainly during this stage of sleep.² REM (or paradoxical) sleep is characterised by quick, irregular eye movements accompanied by physiological changes such as variations in blood pressure, heart and respiratory rates.¹² (There is some evidence that suggests REM sleep is important for memory consolidation.³)

If a person is awakened during REM sleep, alertness returns quickly and dreams may be recalled.¹ A normal sleep pattern will comprise of 4–5 cycles of sleep. A complete cycle comprises all four stages of NREM sleep followed by REM sleep. The complete cycle takes 90–120 minutes to occur.¹
The average adult requires 6–9 hours of sleep each night whereas an elderly person may require only 5–8. Adults spend 45–60% of total sleep time in stages 1 and 2, but the elderly spend up to 80% of sleep time in these stages. A person can be easily aroused through these first two stages and the ease of arousal increases with increasing age. An older person may erroneously feel they have been awake when they have in fact been in stage 2 sleep. This can influence an older adult’s perception of total time spent awake. Older people spend 5–15% of sleep time in stages 3 and 4 compared to younger adults who spend 15–25% in these restorative sleep stages. The elderly have increased nocturnal awakenings and remain awake for longer, hence reducing their sleep efficiency, i.e. increased amount of time in bed relative to time spent asleep.

Insomnia

Insomnia is characterised by complaints of disturbed sleep even though there has been adequate opportunity for sleep. It is a complex problem that may present with difficulty falling asleep, difficulty in maintaining sleep, early awakenings or combinations of these problems. The subjective experience of poor sleep must occur at least three times a week for at least a month to be considered as insomnia. Insomnia has been associated with medical problems such as heart disease, hypertension, falls and frequent use of medical services. Daytime consequences of chronic insomnia include increased risk of depression, poor memory, reduced concentration and poor work performance.

In managing insomnia, it is first important to identify any causative factors and address these. Common causes are medications, alcohol, caffeine (whose effect can last 8–14 hours), circadian rhythm disorder, grief, stress, environmental (i.e. too much light, noise or an uncomfortable temperature), anxiety, depression or behavioural causes – such as daytime naps. Medical conditions such as chronic pain, COPD, reflux, heart failure and incontinence can also cause insomnia. Primary sleep disorders are another cause and include periodic limb disorders, restless leg syndrome and sleep apnoea. Eighty percent of insomnia is due to one of these causes. It is important to identify any contributing factor/s to the sleep disorder and treat this/these first.

Behavioural and cognitive therapies

Behavioural and cognitive therapies (BCTs) are ideal for initial treatment of insomnia – in conjunction with treating any causes. They provide a strategy to teach people to improve their sleep without the need for medications. These strategies not only improve sleep in the short-term, but are beneficial throughout a person’s life. BCTs provide persistent sleep improvements and have little potential for harm, nor a risk of drug dependence or drug interactions.

For the patient who is excessively worried about their insomnia or who has unrealisitic expectations about sleep, e.g. believing they need 10–12 hours of sleep each night, cognitive therapy is of benefit. This involves reassurance about sleep requirements (usually 6–9 hours for adults and 5–8 for the elderly) and the principles of sleep regulation, but is only effective when used in conjunction with a behavioural technique. The behavioural techniques of sleep restriction and stimulus control therapy have the most evidence for efficacy are explained in Table 1. These BCTs should be used in conjunction with basic sleep hygiene information, such as those shown in Table 2. Using a combination of

Table 1. Behavioural therapies

<table>
<thead>
<tr>
<th>Therapy</th>
<th>Explanation</th>
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<tr>
<td>Sleep restriction</td>
<td>For the patient who spends an excessive time in bed awake, or one who wakes and has difficulty returning to sleep</td>
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<tr>
<td></td>
<td>• Restrict the time in bed according to the estimated total sleep time. (Minimum time of five hours.)</td>
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<td></td>
<td>• A fixed wake-up time in the morning should be set.</td>
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<td></td>
<td>• As total time asleep improves, increase the amount of time in bed.</td>
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<td>Stimulus Control Therapy</td>
<td>Where a patient takes a long time to fall asleep or to get back to sleep once woken: this associates bed with arousal and frustration</td>
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<td></td>
<td>• Go to bed only when sleepy and if unable to fall asleep within a perceived 20 minutes, get out of the bed.</td>
</tr>
<tr>
<td></td>
<td>• Return to bed only when sleepy.</td>
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Table 2. Sleep hygiene measures

<table>
<thead>
<tr>
<th>Activities that improve sleep</th>
<th>Activities that impair sleep</th>
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<tbody>
<tr>
<td>• Choose a regular time to go to sleep.</td>
<td>• Daytime nap (unless it is &lt;15 minutes).</td>
</tr>
<tr>
<td>• Choose a regular time to get up each day.</td>
<td>• Excessive alcohol intake.</td>
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<tr>
<td>• Regular daytime exercise – preferably in the sun.</td>
<td>• Smoking.</td>
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<tr>
<td>• Take a hot bath before bedtime.</td>
<td>• A heavy meal within 3 hours of bedtime.</td>
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<tr>
<td>• Relax and unwind before getting into bed.</td>
<td>• Caffeine-containing drinks within 4–6 hours of bedtime.</td>
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<td>• Drink warm milk and have a small carbohydrate snack before bed.</td>
<td>• Highly illuminated digital clocks in the bedroom.</td>
</tr>
<tr>
<td>• Ensure sleep is at a comfortable temperature and in a quiet environment.</td>
<td>• Pets sleeping in the bedroom.</td>
</tr>
<tr>
<td>• Daytime nap (unless it is &lt;15 minutes).</td>
<td>• Lying in bed awake for longer than 20 minutes.</td>
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</table>

* There is good evidence for sunlight exposure to help insomnia. In a study of older people, daily exposure to bright light reduced the time spent awake during sleep time by an hour. It also improved efficiency of sleep from 78% to 90.

For the patient who is excessively worried about their insomnia or who has unrealistic expectations about sleep, e.g. believing they need 10–12 hours of sleep each night, cognitive therapy is of benefit. This involves reassurance about sleep requirements (usually 6–9 hours for adults and 5–8 for the elderly) and the principles of sleep regulation, but is only effective when used in conjunction with a behavioural technique. The behavioural techniques of sleep restriction and stimulus control therapy have the most evidence for efficacy are explained in Table 1. These BCTs should be used in conjunction with basic sleep hygiene information, such as those shown in Table 2. Using a combination of
therapies helps patients to fall asleep faster and reduces the amount of time they spend awake throughout the night. Table 3 shows the benefits of BCTs compared to hypnotics, i.e. benzodiazepines, zolpidem and zopiclone.15

Recommendations

It is important that basic sleep hygiene measures are discussed in detail with Mrs EF. She needs to be aware of any activities she currently performs that are contributing to her poor sleep pattern. Once these are identified and she begins changing them, the issue of the use of a long-term benzodiazepine can be addressed. It is also of interest to note that Mrs EF has been diagnosed with depression and, in the elderly, depression can present with insomnia. Geriatric benzodiazepine (BDZ) users are more likely to have clinical depression compared to the remainder of the geriatric population, but whether BDZ use precedes depression or follows the use of these agents is unclear.1 For Mrs EF (who has been on a BDZ for 20 years), withdrawal of the BDZ could possibly benefit her sleep, cognition and memory.18

Next month Part 2 of this article will discuss the adverse effects of hypnotics, methods of withdrawal and the benefits of cessation.

References


Questions

1. Insomnia has been associated with problems such as:
   a) stroke, dyslipidaemia and falls.
   b) heart disease, hypertension and falls.
   c) depression, poor memory and osteoporosis.
   d) heart disease, osteoporosis and falls.

2. Common causes of insomnia include:
   a) heart failure.
   b) alcohol, caffeine.
   c) incontinence.
   d) all of the above.

3. Which of the following statements is correct in relation to non-rapid eye movement sleep?
   a) Stage 1 is essential for memory consolidation.
   b) People can be easily aroused during stage 2.
   c) Older adults spend more time in stages 3 and 4 than younger adults.

4. One of your patients states that they ‘toss and turn’ all night and only get a few hours sleep – even though they are in bed for 10 hours. What is the best advice to give?
   a) Determine how much sleep they actually obtain during the 10 hours and restrict them to only this amount of time in bed.
   b) Discuss ‘sleep hygiene’ and good sleep practices.
   c) Go to bed only when sleepy – if unable to fall asleep after a perceived 20 minutes, get out and return when sleepy.
   d) Determine how much sleep they actually obtain during the 10 hours and restrict them to only this amount of time in bed. Discuss ‘sleep hygiene’ and good sleep practices.

Table 3. Comparative effectiveness of insomnia treatments1,17

<table>
<thead>
<tr>
<th>Sleep outcome measures</th>
<th>Behavioural/ cognitive therapies</th>
<th>Pharmacotherapy</th>
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<tbody>
<tr>
<td>Sleep onset latency*</td>
<td>-23 min</td>
<td>-15 min</td>
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<tr>
<td>Awakenings per night†</td>
<td>32%</td>
<td>39%</td>
</tr>
<tr>
<td>Total sleep time*</td>
<td>+20 min</td>
<td>+41 min</td>
</tr>
<tr>
<td>Time until person wakes after onset of sleep*</td>
<td>-39 min</td>
<td>-26 min</td>
</tr>
<tr>
<td>Sleep quality†</td>
<td>28%</td>
<td>20%</td>
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* Difference between pre-treatment and post-treatment means.
† Percentage change between pre-treatment and post-treatment means.
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