Sleep Clinic Proposal

Proposal: A Sleep and Circadian Rhythms Disorders Clinic for Ste. Anne's Hospital

Executive Summary

Sleep disorders represent a significant burden affecting many if not most of our elderly veterans and as well many NCOSI clients.

This group of disorders which are not well characterised would be better served though a clinic located at St. Anne's which would provide consultation, investigation and treatment options.

There is currently no centre specializing in sleep disorders in either elderly veterans or patients with Operational stress injury so the establishment of such a clinic could allow St Anne's to develop an expertise in this area not only for our elderly population but as well for the OSI patients. It would also allow us to become a leader in this field.

There is ample opportunity to contribute to research in this field as well.

Introduction

The two populations of patients served by Ste. Anne's Hospital and by Centre Ste-Anne differ in a number of important respects, but are similar in at least one important area: both groups suffer significantly from sleep problems. Not only do sleep problems cause considerable distress in our patients leading to a loss of quality of life as well as a loss of productivity, they also are associated this increased mortality. These facts make it urgent that we agressively address the issue of sleep disorders in our institution.

Classification of Sleep Disorders

The American Academy of Sleep Medicine publishes its "International Classification of Sleep Disorders"[1] which is organized into four main categories, Dyssomnias, Parasomnias, Sleep Disorders Associated with Mental, Neurologic, or Other Medical Disorders, and Proposed Sleep Disorders. Click here for a complete listing of Sleep Disorders

Magnitude of the Problem

Veteran inpatients in Ste. Anne's Hospital, as with other elderly, are subject to the typical sleep changes seen with aging, such as: [2]

- decreased total nocturnal sleep time
- delayed onset of sleep
- advanced circadian phase (going to bed earlier and waking earlier in the morning)
- reduced slow-wave sleep (considered restorative sleep)
- reduced REM (rapid eye movement) sleep
- more frequent awakenings
- daytime naps

While these changes are not considered pathological by themselves, they may result in sleep complaints and contribute to a considerable decrease in quality of life. More importantly, though, many of the other conditions which our elderly veterans have, are strongly associated with sleep disorders. In many cases, the sleep difficulty may be caused by the underlying condition, but there is good reason to believe that a number of disorders are actually caused by the sleep problem. For example, obstructive sleep apnea is believed to cause hypertension and possibly other cardiovascular diseases [3], as well as chronic headache and cognitive impairment, although it remains unclear whether the neurocognitive deficits are due to lack of oxygen to the brain, causing neurodegeneration [4], or to sleepiness [5].

For a variety of reasons, many of our inpatient clients go to bed considerably earlier and may also get up later than they did when living at home. Attempting to sleep more than one needs can cause insomnia, commonly treated with

medications which may have serious side effects especially in the elderly and which have only limited efficacy.

There is also a strong link between sleep and pain. For example, disturbed slow-wave sleep is associated with fibromyalgia-type pain, while a lack of slow-wave sleep reduces mechanical pain threshold leading to increased pain levels.

The bottom line is that sleep disorders have significant impact on quality of life, and are very costly, whether in terms of medications or other treatments, nursing care, or (for younger clients) loss of productivity.

Prevalence of sleep disorders

While not often formally documented in our elderly veterans sleep disorders are quite common. In a study of the prevalence of sleep disorders in primary care by survey, insomnia was reported in 32.3% of patients, obstructive sleep apnea syndrome in 23.6%, and restless legs syndrome in 29.3% in all patients over the age of eighteen [6]. In the elderly, the Alameda County Study [7] found a 23.4% one-year prevalence of insomnia, predicted by gender, mood disturbance, and chronic health problems. In another study it was found that the prevalence of moderate to severe sleep-disordered breathing was estimated to be 21.4% to 26.4%, increased with increasing age, from 22.8% for those younger than 72 to 30.1% for those aged 80 and older [8].

Further in a study of patients admitted to a stroke rehabilitation unit 59% were found to have sleep apnea [9]. When all 492 residents in four nursing homes in the Los Angeles area were screened for daytime sleeping, 339, or 68.9%, were observed to be asleep on more than 15% of observations done every 15 minutes between 9 am and 5 pm over 2 days [10]. Sleep disturbance is common among dementia patients, especially those with Alzheimer's disease [11].

Sleep disturbances are considered so important in Posttraumatic Stress Disorder (PTSD) that they form part of the diagnostic criteria for PTSD: in DSM-IV, recurrent distressing dreams are listed in the symptom cluster of re-experiencing symptoms, while difficulty falling asleep or staying asleep are part of the arousal symptom cluster. Further the presence of sleep complaints one month after a

trauma can be used to detect patients who will go on to develop chronic PTSD [12].Finaly out of 201 consecutive patients referred to a U.S. Veterans Affairs outpatient pain clinic, it was found that 169 patients, or 89.9%, scored as "poor sleepers" on the Pittsburgh Sleep Quality Index [13].

Thus there is an impressive array of evidence supporting a prevalance of sleep disorders in our elderly veterans as will as our younger clientelle.

Disability caused by sleep disorders

Patients suffering from insomnia commonly report significant reduction in quality of life [14] and in coping abilities [15]. Severity of insomnia has been found to correlate with cognitive impairment in unmedicated patients with primary insomnia [16]. Chronic insomnia independently predicts incidence of cognitive decline in older men [17]. In elderly nursing home residents, insomnia, but not hypnotic use, is associated with a greater risk of subsequent falls [18].

Sleep disorders and quality of life

Sleep and pain

High levels of disturbed sleep have been found to be associated with a reduced pain threshold [19]. It is possible to lower the pain tolerance threshold for mechanical pain with total sleep deprivation; interruption of slow wave sleep or of REM sleep tends to decrease pain thresholds also [20]. Another study [21] found that selective disruption of slow wave sleep without decreasing sleep time over three nights not only lowered musculoskeletal pain threshold but also increased discomfort, tiredness, and fatigue.

With regard to fibromyalgia-type pain, increased pain sensitivity is associated with greater sleep disturbance [22]. It is possible to induce diffuse musculoskeletal pain, tenderness, and fatigue in normal healthy subjects by noise stimuli that disrupt slow wave sleep [23]. Interestingly, simple sleep deprivation failed to increase pain in healthy women, although being woken hourly led to an increase in spontaneous pain and a loss of pain inhibition [24].

These findings and others have led to the conclusion that in rheumatic diseases and other painful conditions "Identification of co-occurring sleep disorders

followed by aggressive treatment is recommended and has the potential to improve quality of life, ameliorate pain, and improve psychosocial adaptation to the primary illness" [25].

Sleep and fatigue

In cancer patients, fatigue is the most distressing symptom and the most likely to interfere with self-care. Fatigue is also a significant issue in other medical illnesses; for example, fatigue affects nearly 80% of patients with rheumatoid arthritis.

Workload caused by sleep disorders

The exact workload caused by sleep disorders is quite difficult to characterize, however, the number of benzodiapines - which may be of dubious value - used in attempts to treat insomnia testify to its prevailence.

Available Treatment

Many sleep disorders are treatable. In insomnia there are many available treatments including enviromental manipulation, alterations in diet, cognative behavioral therapy and medication. While benzodiazepines are indicated for short-term treatment of primary insomnia, after 30 days of continuous use their effectiveness is either not superior to placebo or remains unknown [26]. In the elderly, the clinical benefits of sleep medications are small and for some individuals are actually outweighed by their adverse effects [27]. However, a recent randomized, double-blind, controlled trial showed that Cognitive-Behavioural Therapy (CBT) was more effective than zopiclone in older adults [28]. This type of treatment shows sustainable effects to at least 24 months after treatment completion [29]. Further exposure to bright light has been shown to decrease nighttime agitation and improve nighttime sleep in institutionalized people with Alzheimer's Disease.[30]

For the treatment of Obstructive sleep apnea there also a number of options. Weight loss may be the primary treatment for mild to moderate OSA severity with a 10-lb weight loss possibly reducing CPAP pressure requirements. Bariatric surgery is effective[31] Avoidance of alcohol or benzodiazepines also helps.

Simple maneuvers to promote sleeping on one's side, for example by wearing a T-shirt with tennis balls placed in pockets sown on the back, down the midline, may improve positinal sleep apnea. Oral appliances that pull the tongue or mandible forward are also used with some success. Surgical procedures to correct abnormalities of the soft tissue or skeletal structure including laser-assisted uvulopalatopharyngoplasty, tonsillectomy, mandibular advancement, and tracheostomy are also available. Nasal CPAP (Continuous Positive Airway Pressure) is of course the most well known treatment.

Effect of Treatment

Most importantly treating sleep disorders would lead to an increase in the quality of live for our patients. There may, however, be other benefits as well. Studies have shown that treatment of obstructive sleep apnea syndrome in depressed patients, both those on antidepressants and unmedicated, improves depression [32]. In PTSD patients with OSA, treatment of the OSA leads to decreased nightmares and other PTSD symptoms [33] Sleep disorders have as well been associated with variations in the immune system. Indeed it has been suggested that improving sleep could enhance the success of vacinations and improve diseases characterised by type 2 cytokine overactivity.[34]

Sleep Disorders in OSI

Indeed, these symptoms are so treatment-resistant that clinicians are willing to try powerful antipsychotic medications such as risperidone or aripripazole[35] [36] and their search continues for novel interventions, for example with prazosin[37] or guanfacine [38], medications ordinarily used to treat hypertension.

Circadian Rhythm Disturbances in OSI

It has been found that U.S. veterans who are ill with Gulf War Syndrome have blunted circadian rhythms of heart rate variability, compared to control veterans matched for age, sex, and education [39].

Clinical Approaches to Common Sleep Disorders

Screening

eg, the Global Sleep Assessment Questionnaire (Copyright 2001 Pharmacia Corporation)

History

1. Quality of sleep
2. Times of day
    - going to bed
    - waking
    - out of bed for the day
3. Waking during the night
    - why
    - frequency
    - duration
4. Daytime drowsiness
    - how often
    - time of day or evening
    - how distressing?
    - accidents, near-accidents
5. Daytime fatigue
6. Daytime naps
    - frequency
    - time
    - duration
7. Sleeping aids
    - prescription medications
    - other people's prescriptions

    - over-the-counter medications
    - alcohol
8. Sleep problems
    - frequency
    - how distressing?
9. Stimulants
    - prescription or over-the-counter medications
    - caffeine (coffee, tea, soft drinks)
10. Attitudes towards sleep
11. Sleep log

Examination

Laboratory

- For secondary sleep disturbances: work up the primary condition
- Polysomnography[40]
- Multiple sleep latency test (MSLT)[41]
- Maintenance of wakefulness test[42]
- Actigraphy[43]

Obstructive Sleep Apnea

[3] [2] [44]

Symptoms

1. Snoring
    - Although most OSA patients snore, they may be unaware of it.
    - Family members may note disruptive snoring with quiet periods and reduced respiration.
2. Fatigue
3. Daytime sleepiness
4. Morning headache
5. Alcohol or benzodiazepines

- alcohol or benzodiazepine intake in the evening may decrease neuromuscular tone, suppress respiratory drive, prevent arousals that interrupt prolonged apneas
- long-acting benzodiazepines (eg, clonazepam) taken at any time

Signs

1. Overweight or obese
2. Large neck circumference[45]
3. Pharyngeal collapse (Muller manoeuvre)[45]
4. Cognitive impairment
5. Hypertension
6. Agitation

Laboratory

1. Overnight polysomnogram

Treatment

1. Weight loss
   - primary treatment for mild to moderate OSA severity
   - a 10-lb weight loss may reduce CPAP pressure requirements
   - bariatric surgery is effective[31]
2. Avoidance of alcohol or benzodiazepines
3. Sleeping on one's side
   - Wearing a T-shirt with tennis balls placed in pockets sown on the back, down the midline
4. Nasal CPAP (Continuous Positive Airway Pressure)
   - the amount of pressure needs to be titrated (typically in a sleep lab; self-titrating devices are available)
   - evening alcohol increases pressure requirements
   - in depressed patients, CPAP can significantly improve Beck Depression Inventory scores[32]
5. Surgical procedures for abnormalities of the soft tissue or skeletal structure
   - laser-assisted uvulopalatopharyngoplasty
   - tonsillectomy

    - mandibular advancement
    - tracheostomy
6. Oral appliances that pull the tongue or mandible forward

Insomnia

Nightmares

REM Sleep Behaviour Disorder

Restless Legs Syndrome

Proposal for a Clinic

We propose that a Sleep and Circadian Rhythms Clinic be set up at SAH, to serve clients from the hospital and from Centre Ste. Anne. Subsequent sections of this proposal detail the roles that such a clinic would play including in teaching and research; describe the target populations and the referral processes; outline requirements for staffing, equipment, space, and budget; consider administrative concerns including mechanisms for supervision, monitoring, and quality improvement; and discuss funding possibilities.

Clinic Roles

It is proposed that the clinic accept referrals for the investigation and treatment of sleep disorders and disorders of circadian rhythms. The client population will include SAH and CSA inpatients, as well as CSA and Liaison Centre outpatients. The clinic will also be involved in teaching and in research.

Investigation and Treatment of Sleep Disorders

Wrist actigraphs play a useful role in studying sleep disorders. For example, they are better able to quantify awakenings compared to sleep logs, in PTSD patients with sleep complaints [46].

Investigation and Treatment of Circadian Rhythms Disorders

Target Populations

Research

Teaching

The recently concluded agreement between McGill University and SAH foresees an expanded role for the hospital in providing teaching to McGill students. The proposed clinic will be in a position to provide specialized clinical training to medical students and residents as well as nursing students.

Referral of Patients to the Clinic

The Global Sleep Assessment Questionnaire (GSAQ) can help distinguish between sleep disorders (including no sleep disorder) and is suggested as a reliable and valid sleep disorder screener [47].

The SleepStrip disposeable sleep apnea screener is an inexpensive, single-use device.

Clinic Staffing

Respirologist

- Provide expert opinion on respiratory disorders.

Psychologist

- Cognitive-Behavioural Therapy (CBT) for primary insomnia
- teaching
- research

Psychiatrist

General Medicine Physician

- Coordinate care
- Assess impact of medical conditions

Nurse Clinician

- take histories
- administer rating scales, questionnaires, other test instruments
- hook up patients for polysomnography, actigraphy, etc.
- provide teaching to patients and families for outpatient polysomnography

Secretary/Administrative Assistant

- book clinic appointments
- coordinate clinician schedules
- order supplies
- inventory control
- chart maintenance

Clinic Infrastructure and Equipment

The clinic could use St. Anne's clininc space for consultations as well as for studies. Especially as studies may be done during silent hours.

1. Equipment for ambulatory polysomnograms. Some examples:
    - Grass Technologies Aura PSG Wireless/Ambulatory Sleep System
    - Braebon Pursuit Sleep2 Full PSG System
    - Weinman SomnoCheck

Budget and Funding

Capital and Startup Costs

Equipment

Furniture

Nil, use of available furniture

Operating Expenses

Supplies

Salaries

Sources of Funding

Ste. Anne's Foundation

RAMQ

Supervision, Monitoring, Quality Assurance

Conclusion

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41. ↑ The Multiple Sleep Latency Test involves having the subject lie down in a dark, quiet room for 20 minutes, at 2-hour intervals during the day. The time to fall asleep is measured.

42. ↑ The Maintenance of Wakefulness test aims to assess the ability of the individual to resist falling asleep, again during 20-minute periods, at least 4 times during the day.
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